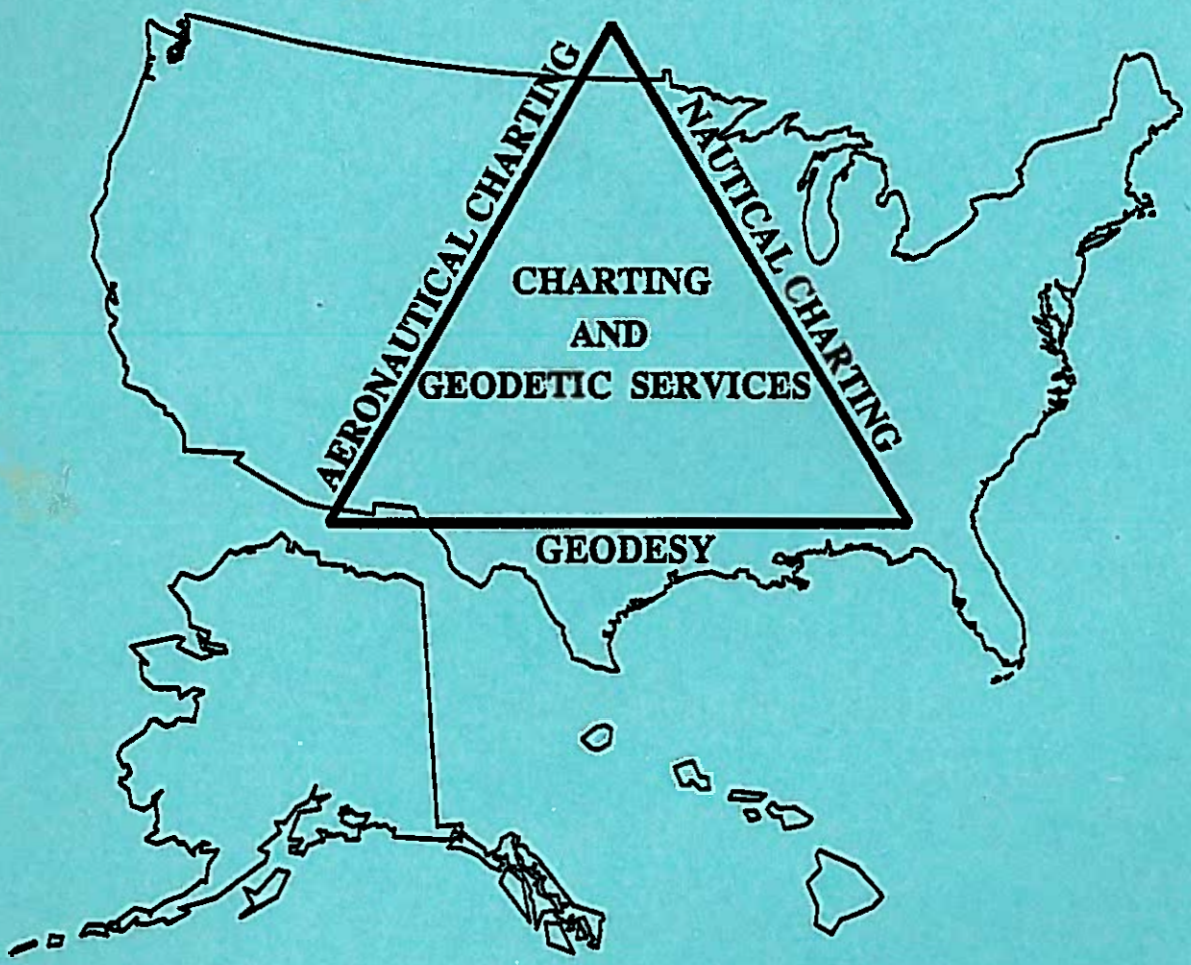
STATES' ACTIVITIES REPORT
FY 1991 - FY 1992



CHARTING AND GEODETIC SERVICES
NATIONAL OCEAN SERVICE, NOAA
ROCKVILLE, MD 20852

FEBRUARY 1991

FOREWORD

This report is the latest in a series of similar reports of activities in the 50 states. It covers the activities of Charting and Geodetic Services (C&GS) of the National Ocean Service for FY 91 and FY 92. Activities that were undertaken in FY 90 and earlier also are included for historical reference. The report features separate descriptions of activities scheduled by C&GS program function.

Each state's activities are listed separately and organized into five sections:

1. Name and Status of C&GS' Programs During FY 91
2. Current and Future Funding of C&GS Programs
3. Significant Past Involvement in FY 90 and Earlier,
4. Planned C&GS Initiatives for FY 92
5. Specific Issues of Interest to the State.

All states are then organized into regional geographic groups for ease of reference.

Descriptions of C&GS activities in the Islands and Possessions of the United States are also presented in a separate section which follows the descriptions of activities in the 50 states.

This report is available for unrestricted use and dissemination. Comments about the content, format, and utility of this report will be appreciated.

Note — This came from Norman's EEZ conf. look at Guam section & Appendix A. Although I'm not sure of their significance to Guam, suggest we distribute to appropriate agencies/persons

PSG
GEPS

2

J. Austin Yeager
Rear Admiral, NOAA
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Charting and Geodetic Services

ACKNOWLEDGMENT

The following National Ocean Service employees provided information about their respective programs for use in preparation of this report. They can be contacted for any questions or additional information concerning the States' activities. (All telephone numbers are area code 301).

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Information About Charting and Geodetic Service's (C&GS) Programs for Maine

1. Name and Status of C&GS Programs for Maine During FY 91

Geodesy. The National Geodetic Survey Division Division (NGSD) maintains in the NGSD data base approximately 10,397 horizontal control points and 10,430 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Nautical Charting. There are 38 nautical charts and 16 bathymetric and topographic/bathymetric maps providing coverage of Maine's waters including the Penobscot River and Bay, and the Kennebec River.

During FY 91, eight new editions of nautical charts will be issued for the State's coastal areas. These charts are:

Number	Scale	Name
13285	20000	Port Smith to Dover and Exeter
13287	20000	Saco Bay and Vicinity
13293	40000	Damariscotta-Sheepscot and Kennebec Rivers
13309	40000	Penobscot River-Belfast Harbor
13315	20000	Deer Island Thorofare-Casco Passage
13322	10000	Winter Harbor
13324	40000	Tibbett Narrows to Schoodic Island
13327	40000	West Quoddy Head to Cross Island

In FY 91, shoreline mapping operations for two adjoining projects are scheduled to begin. Coverage will extend from Bull Hill Bay to Western Bay and will consist of sixteen shoreline maps. These maps will be produced using photogrammetric techniques and instruments and will provide the graphic representation of selected features measured from aerial photographs. Feature delineation will include the shoreline, alongshore coastal features, and a narrow zone of natural and man-made features inland from the shore. Shoreline maps are primarily used to

support nautical chart maintenance and new chart construction, hydrographic survey operations, and coastal management programs.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of Maine to the new NAD 83. In addition, LORAN-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

Nautical Publications. Maine's coastal navigation information is contained in Coast Pilot 1. A new edition of Coast Pilot 1 is scheduled for publication in FY 91.

There are 74 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in the coastal areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Three Airport Obstruction Charts and three Obstruction Data Sheets are planned for publication in FY 91.

C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the state of Maine. Visual chart coverage includes three Sectional Charts that are updated every 6 months and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 3 low and high altitude Enroute Charts, and 57 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being updated for use during the transition between the take-off and enroute portion of flight, and for the transition between the enroute portion of flight and landing.

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Chart (STAR's).....0
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 9
  Category II ILS - special aircrew and aircraft
    certification required 1
  Category III A ILS - special aircrew and aircraft
    certification required 0
  Microwave Landing System (MLS) 0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB) 19
  Very High Frequency Omnidirectional Range (VOR) 23
  Area Navigation (RNAV).....0
  Localizer (LOC) and Localizer Backcourse (LOCBC).....4
  Localizer Directional Aid (LDA) 0
  Simplified Directional Facility (SDF) 0
Visual Approach Procedures 1
Airport Diagrams 2
TOTAL 60

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Maine. The IAP's are updated on a 56-day cycle.

AUBURN-LEWISTON MUNICIPAL
AUGUSTA STATE
BANGOR INTERNATIONAL
BELFAST MUNICIPAL
BIDDEFORD MUNICIPAL
CARIBOU MUNICIPAL
CENTRAL MAINE AIRPORT OF NORRIDGEWOCK
DEWITT FIELD-OLD TOWN MUNICIPAL
EASTERN SLOPES REGIONAL
GREENVILLE MUNICIPAL
GREENVILLE SEAPLANE BASE
HANCOCK COUNTY-BAR HARBOR
HOULTON INTERNATIONAL
KNOX COUNTY REGIONAL
LINCOLN REGIONAL
LITTLEBROOK AIR PARK
MACHIAS VALLEY
MILLINOCKET MUNICIPAL
NORTHERN MAINE REGIONAL AIRPORT AT PRESQUE ISLE
NORTHERN AROOSTOOK REGIONAL
PITTSFIELD MUNICIPAL
PORTLAND INTERNATIONAL JETPORT
PRINCETON MUNICIPAL
RANGELEY MUNICIPAL
SANFORD MUNICIPAL
WATERVILLE ROBERT LAFLEUR
WISCASSET

The following is a list of Standard Instrument Departure (SID) charts available for the state of Maine. The SID's are updated on a 56-day cycle.

PORTLAND INTERNATIONAL JETPORT

2. Current and Future Funding of C&GS Programs in the State of Maine

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Aeronautical Charting	274.4	3.0	274.4	3.0
Geodetic Control Surveys: Strain Network (2 stations)	-	-	4.0	0.1
OC Program	63.0	0.9	63.0	0.9
Nautical Charting	19.4	0.4	26.6	0.5
TOTAL	356.8	4.3	368.0	4.5

3. Significant Past C&GS Involvement in the State of Maine

Geodesy. Six Calibration Base Lines have been established in the State: Auburn, Brunswick, China, Greenbush, Rockland, and Sanford. In support of the readjustment of the North American Vertical Datum project, a total of 413 kilometers of leveling were accomplished in Maine during FY 79.

Geodetic Surveys were completed at 13 FAA airports in support of the FAA Airport Datum Monumentation (ADAM) Program in FY 86: Belfast, Caribou, Eliot, Frenchville, Greenville, Houlton, Lincoln, Millinocket, Norridgewock, Old Town, Pittsfield, Princeton and Stanford. Fifteen Global Positioning System (GPS) stations were observed in Southeastern Maine in FY 86 for the Nuclear Regulatory Commission.

In FY 89, 57 horizontal and 176 vertical control marks were recovered.

In FY 89, NGSD performed geodetic control surveys at two airports, Biddeford and Fryberg, in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program. In FY 89, NGSD established 20 GPS points for the Nuclear Regulatory Commission in Maine.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 7,038 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public.

The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

In FY 90, two geodetic control stations were occupied by GPS receivers as part of the U.S. Eastern Strain Network. These stations were located near Smyrna Mills and Prospect Harbor, Maine.

Nautical Charting. New editions of 15 existing nautical charts and a new edition of Coast Pilot 1 were scheduled for publication in FY 90. There were new editions of six existing nautical charts and a new edition of Coast Pilot 1 published in FY 89. The charts are:

Number	Scale	Name
13278	80000	Portsmouth to Cape Ann Hampton Harbor
13286	80000	Cape Elizabeth to Portsmouth Cape Porpoise Harbor
13288	80000	Monhegan Island to Cape Elizabeth
13290	40000	Casco Bay
13292	20000	Portland Harbor
13293	40000	Damariscotta-Sheepscot and Kennebec Rivers
13298	15000	Bath to Augusta
13301	40000	Muscongus Bay New Harbor
13302	80000	Penobscot Bay and Approaches
13305	40000	Penobscot Bay
13307	20000	Camden, Rockport and Rockland Harbors
13308	15000	Fox Islands Thorofare
13309	40000	Penobscot River-Belfast Harbor
13312	80000	Frenchman and Blue Hill Bays and Approaches
13313	40000	Approaches to Blue Hill Bay
13316	40000	Blue Hill Bay
13318	40000	Frenchman Bay and Desert Island
13321	10000	Southern Harbor and Approaches
13323	10000	Bar Harbor
13326	40000	Machias Bay to Tibbett Narrows
13328	40000	Calais to West Quoddy Head-Eastport Harbor

Three small craft charts were temporarily cancelled because of funding constraints. The Canadian Hydrographic Service conducted hydrographic surveys in Passamaquoddy Bay in FY 86 and FY 87 as part of a cooperative mapping and charting effort with C&GS.

Aeronautical Charting. The following OC/ODS's were published in FY 90:

OC 909 Sanford

4. Planned C&GS Initiatives in the State of Maine During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 41 state affiliates of the NOAA/NGSD automatic subscriber service in Maine. This will also improve services for ad hoc requestors from the State.

Two geodetic control stations will be occupied during the resurvey of the Eastern Strain Network.

Nautical Charting. New editions of 11 existing nautical charts are scheduled for publication in FY 92. These charts are:

Number	Scale	Name
13283	20000	Cape Neddick Harbor to Isles of Shoals
13286	80000	Cape Elizabeth to Portsmouth Cape Porpoise
13288	80000	Monhegan Island to Cape Elizabeth
13290	40000	Casco Bay
13292	20000	Portland Harbor
13296	15000	Boothbay Harbor to Bath-Including the Kennebec River
13305	40000	Penobscot Bay
13316	40000	Blue Hill Bay
13318	40000	Frenchman Bay and Desert Island
13325	80000	Quoddy Narrows to Petit Manan Island
13328	40000	Calais to West Quoddy Head - Eastport Harbor

A new edition of Coast Pilot 1 is scheduled for publication in FY 92.

Aeronautical Charting. Three OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution services to subscribers, to catalog customers, and to 22 authorized National Ocean Service chart agents in the state can be improved.

5. Specific Issues of Interest to the State of Maine

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum

of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for New Hampshire

1. Name and Status of C&GS' Programs for New Hampshire During FY 91

Geodesy. The National Geodetic Survey Division Division (NGSD) maintains in the NGSD data base approximately 1,078 horizontal control points and 2,222 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time, resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Nautical Charts. There are seven nautical charts and eight bathymetric and fishing maps which provide coverage of New Hampshire's coastline and waterways. During FY 91, two new editions of existing nautical charts will be published for the state's coastal areas. These charts are:

Number	Scale	Name
13274SC	40000	Portsmouth Harbor to Boston Harbor
13285	20000	Port Smith to Dover and Exeter

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of New Hampshire to the new NAD 83. In addition, LORAN-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

Nautical Publications. New Hampshire's coastal navigation information is contained in Coast Pilot 1. A new edition of Coast Pilot 1 is scheduled for publication in FY 91.

There are five nautical chart sales agents in this state. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of New Hampshire. Visual chart coverage includes two Sectional Charts and one Terminal Area Chart that are updated every 6 months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 5 Low and High Altitude Enroute Charts, and 32 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being updated for use during the transition between the take off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's)	0
Standard Terminal Arrival Chart (STAR's)	0
Precision Instrument Approach Charts:	
Instrument Landing System (ILS)	6
Category II ILS - special aircrew and aircraft certification required	0
Category III A ILS - special aircrew and aircraft certification required	0
Microwave Landing System (MLS)	1
Nonprecision Instrument Approach Charts:	
Nondirectional Radio Beacon (NDB)	9
Very High Frequency Omnidirectional Range (VOR)	11
Area Navigation (RNAV)	2
Localizer (LOC) and Localizer Backcourse (LOCBC)	3
Localizer Directional Aid (LDA)	0
Simplified Directional Facility (SDF)	0
Visual Approach Procedures	0
Airport Diagrams	2
TOTAL	34

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of New Hampshire. The IAP's are updated on a 56-day cycle.

BERLIN MUNICIPAL
BOIRE FIELD
CLAREMONT MUNICIPAL
CONCORD MUNICIPAL
DILLANT-HOPKINS
JAFFREY MUNICIPAL-
SILVER BRANCH
LACONIA MUNICIPAL
LEBANON MUNICIPAL
MANCHESTER AIRPORT-
GRENIER INDUSTRIAL AIRPARK
MOUNT WASHINGTON REGIONAL
SKYHAVEN

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two Airport Obstruction Charts and two Obstruction Data Sheets are planned for publication in FY 91.

2. Current and Future Funding of C&GS Programs in New Hampshire

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time
OC Program	42.0	0.6	21.0	0.3
Aeronautical Charting	165.2	1.9	165.2	1.9
Nautical Charting	4.8	0.1	5.0	0.1
TOTAL	292.0	3.1	271.2	2.8

3. Significant Past C&GS Involvement in the State of New Hampshire

Geodesy. Four calibration base lines have been established in the State: Berlin, Concord, Durham and Nashua. A reimbursable Global Positioning System (GPS) survey (25 stations) was conducted for the State's Department of Transportation in FY 87.

Geodetic surveys of three airports were performed in FY 87 in support of the Federal Aviation Administration (FAA) Airport Datum Monu- mentation (ADAM) Program: Claremont, Jaffery, and Rochester.

In FY 89, 37 horizontal and 89 vertical control marks were recovered.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 722 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. In FY 87, no new editions of nautical charts and one new edition of Coast Pilot 1 were published.

Aeronautical Charting. The Following OC/ODS's were published in FY 90:

791 Berlin
5082 Whitefield

4. Planned C&GS Initiatives for the State of New Hampshire During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 31 State affiliates of the NOAA/NGSDautomatic subscriber service in New Hampshire. This will also improve services for ad hoc requestors from the state.

Nautical Charting. Two new nautical chart editions and a new edition of Coast Pilot 1 are scheduled for FY 92. The charts are:

Number	Scale	Name
13283	20000	Cape Neddick Harbor to Isles of Shoals
13286	80000	Cape Elizabeth to Portsmith-Cape Porpoise Harbor

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to 15 authorized National Ocean Service chart agents in the State can be improved during FY 92.

One OC/ODS is tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of New Hampshire

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Vermont

1. Name and Status of C&GS Programs for Vermont During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 1,302 horizontal control points and 2,742 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement with the State, a full-time resident advisor inspects control surveys performed by State personnel and provides field training as needed.

Nautical Charting. There are six nautical charts which provide coverage of Vermont, including Lake Champlain and the Hudson River. During FY 91, one new edition of the existing nautical charts will be published. This chart is:

Number	Scale	Name
14785	10000	Burlington Harbor

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of Vermont to the new NAD 83.

Nautical Publications. Vermont's chart navigation information is contained in Coast Pilot 1. A new edition of Coast Pilot 1 is scheduled for publication in FY 91.

There are 15 nautical chart sales agents in this state. These agents typically are small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Three OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Vermont. Visual chart coverage includes two Sectional Charts that are updated every 6 months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 5 Low and High Altitude Enroute Charts, and 17 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being updated for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Chart (STAR's).....0
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 2
  Category II ILS - special aircrew and aircraft
                certification required 0
  Category III A ILS - special aircrew and aircraft
                certification required 0
  Microwave Landing System (MLS) 0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB) 7
  Very High Frequency Omnidirectional Range (VOR) 4
  Area Navigation (RNAV) 0
  Localizer (LOC) and Localizer Backcourse (LOCBC).....3
  Localizer Directional Aid (LDA) 1

Simplified Directional Facility (SDF) 0
Visual Approach Procedures 0
Airport Diagrams 1
TOTAL 19

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Vermont. The IAP's are updated on a 56-day cycle.

BENNINGTON STATE
BURLINGTON INTERNATIONAL
CALEDONIA COUNTY
EDWARD F. KNAPP STATE
FRANKLIN COUNTY STATE
HARTNESS STATE AIRPORT-SPRINGFIELD
MORRISVILLE-STOWE STATE
MOUNT SNOW
NEWPORT STATE
RUTLAND STATE

The following is a list of Standard Instrument Departure (SID) charts available for the state of Vermont. The SID's are updated on a 56-day cycle.

BURLINGTON INTERNATIONAL

2. Current and Future Funding of C&GS Programs in the State of Vermont

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor	80.0	1.0	80.0	1.0
Geodetic Control Surveys: Strain Network (1 station)	-	-	2.0	0.1
OC Program	63.0	0.9	21.0	0.3
Aeronautical Charting	115.1	1.3	115.1	1.3
Nautical Charting and Coast Pilot	2.4	0.1	2.5	0.1
TOTAL	260.5	3.3	220.6	2.8

3. Significant Past C&GS Involvement in the State of Vermont

Geodesy. One Calibration Base Line was established in the State: Rutland. In FY 84, approximately 139 kilometers of single-run leveling were performed in Vermont to provide datum validation of

Lake Champlain for the United States/Canada Hydrographic Commission. In support of the readjustment of the North American Vertical Datum project, a total of 303 kilometers of releveling were accomplished in Vermont in FY 79-81.

Geodetic surveys were performed at six airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program in FY 87: Bennington, Lyndenville, Newport, Highgate, Morrisville, and West Dover.

In FY 89, 9 horizontal and 11 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 858 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

In FY 90, one geodetic control station near Alburg Center, Vermont, was occupied with a GPS receiver during the Eastern Strain Network survey.

Nautical Charting. In FY 90, a new edition of Coast Pilot 1 was published. There was one new edition of an existing nautical chart and a new edition of Coast Pilot 1 published during FY 89. The chart was:

Number	Scale	Name
14781	40000	Richelieu River to South Hero Island

Aeronautical Charting. The following OC/ODS's were published in FY 90:

968 Rutland

4. Planned C&GS Initiatives in the State of Vermont During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 27 State affiliates of NOAA/NGSD automatic subscriber service in Vermont. This will also improve services for ad hoc requestors from the State.

One geodetic control station will be occupied with a GPS receiver during the resurvey of the Eastern Strain Network.

Nautical Charting. Two new editions of existing nautical charts, and a new edition of Coast Pilot 1 are scheduled for publication during FY 92. The charts are:

Number	Scale	Name
14782	40000	Cumberland Head to Four Brothers Islands
14783	40000	Four Brothers Islands to Barber Point

Aeronautical Charting. One OC/ODS is tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to seven authorized National Ocean Service chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Vermont

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum for 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for the Commonwealth of Massachusetts

1. Name and Status of C&GS Programs for Massachusetts During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 8,878 horizontal control points and 2,343 vertical control points in the Commonwealth.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the Commonwealth in planning geodetic surveys and trains Commonwealth personnel in survey operations and procedures.

Nautical Charting. A total of 39 nautical charts, 15 bathymetric, topographic/bathymetric, and fishing maps provide coverage for Massachusetts. During FY 91, 11 new editions of these charts will be issued. These charts are:

Number	Scale	Name
13218	80000	Marthas Vineyard to Block Island
13221	40000	Narragansett Bay
13226	20000	Mount Hope Bay
13233	40000	Marthas Vineyard - Menemsha Pond
13235	5000	Woods Hole
13236	20000	Cape Cod Channel and Approaches
13244	40000	Eastern Entrance to Nantucket Sound
13253	20000	Plymouth, Kingston and Duxbury Harbors
13260	378838	Bay of Fundy to Cape Cod
13270	25000	Boston Harbor
13274SC	40000	Portsmouth Harbor to Boston Harbor

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of Massachusetts to the new NAD 83. In addition, LORAN-C lines of positioning have been added to all

coastal and offshore series charts as an electronic aid to navigation.

Nautical Publications. Massachusetts coastal navigation information is contained in Coast Pilot 1. A new edition of Coast Pilot 1 is scheduled for publication in FY 91.

There are 89 nautical chart sales agents in Massachusetts. These agents are typically small retail sporting goods and marine businesses in recreational areas, although some may be bookstores, map dealers, etc.,located in other parts of the Commonwealth.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Four OC/ODS's are scheduled to be published in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying undervisual and instrument conditions in the Commonwealth of Massachusetts. Visual chart coverage includes one Sectional Chart and one Terminal Area Chart that are updated every 6 months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 5 low and high altitude Enroute Charts, and 74 Instrument Approach Procedure Charts in one bound volume.

In FY 91, the following instrument aeronautical charts are being produced for use during the transition between take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing.

Standard Instrument Departure Charts (SID's).....5
Standard Terminal Arrival Chart (STAR's).....2
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 16
  Category II ILS - special aircrew and aircraft
    certification required 1
  Category III A ILS - special aircrew and aircraft
    certification required 0
  Microwave Landing System (MLS) 0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB) 28
  Very High Frequency Omnidirectional Range (VOR) 24
  Area Navigation (RNAV) 0
  Localizer (LOC) and Localizer Backcourse (LOCBC).....5
  Localizer Directional Aid (LDA) 0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures 0
Airport Diagrams 7
TOTAL 88

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Massachusetts. The IAP's are updated on a 56-day cycle.

ALBANY
BARNES MUNICIPAL
BARNSTABLE MUNICIPAL-
BOARDMAN/
  POLANDO FIELD
BEVERLY MUNICIPAL
BOSTON
CHATHAM MUNICIPAL
FALL RIVER MUNICIPAL
FITCHBURG MUNICIPAL
GARDNER MUNICIPAL
GENERAL EDWARD LAWRENCE
  LOGAN INTERNATIONAL
GREAT BARRINGTON
HOPEDALE INDUSTRIAL PARK
LAURENCE G. HANSCOM FIELD
LAWRENCE MUNICIPAL
MANSFIELD MUNICIPAL
MARSHFIELD
MARTHAS VINEYARD
METROPOLITAN
MINUTE MAN AIRFIELD
NANTUCKET MEMORIAL
NEW BEDFORD MUNICIPAL
NORTHAMPTON
NORWOOD MEMORIAL
ORANGE MUNICIPAL
OTIS ANGB
PITTSFIELD MUNICIPAL
PLUM ISLAND
PLYMOUTH MUNICIPAL
PROVINCETOWN MUNICIPAL
SOUTHBRIDGE MUNICIPAL
TAUNTON MUNICIPAL
TEW-MAC
TURNERS FALLS
WORCESTER MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Massachusetts. The SID's are updated on a 56-day cycle.

BEVERLY MUNICIPAL
GENERAL EDWARD LAWRENCE
  LOGAN INTERNATIONAL
LAURENCE G. HANSCOM FIELD
LAWRENCE MUNICIPAL
NORWOOD MEMORIAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Massachusetts. The STAR's are updated on a 56-day cycle.

BARNES MUNICIPAL
BRADLEY INTERNATIONAL
GENERAL EDWARD LAWRENCE
LOGAN INTERNATIONAL
GARTFORD-BRAINARD
MERIDEN MARKHAM MUNICIPAL
WESTOVER METROPOLITAN

2. Current and Future Funding of C&GS Programs in the Commonwealth of Massachusetts

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part time	80.0	1 part time
Strain Network (1 station)	-	-	2.0	0.1
Aeronautical Charting	395.3	4.5	395.3	4.5
OC Program	84.0	1.2	84.0	1.2
Nautical Charting	26.6	0.5	40.1	0.7
TOTAL	585.9	6.7	601.4	7.0

3. Significant Past C&GS Involvement in the Commonwealth of Massachusetts

Geodesy. Five Calibration Base Lines have been established in the Commonwealth: Cape Cod, Georgetown, Marlboro, Pittsfield, and Turners Falls.

In support of the readjustment of the North American Vertical Datum project, a total of 110 kilometers of releveling were accomplished in Massachusetts in FY 81.

Geodetic surveys were completed at seven airports in support of the Federal Aviation Administration Airport Datum Monumentation (ADAM) program in FY 86: Chatham, Fall River, Hopedale, Mansfield, Marshfield, Plymouth, Taunton.

NGSD established a Very Long Base Line Interferometry station at Westford, MA which is part of a three-station Polar Motion Analysis by Interferometry Survey Network. This network was established in the early 1980's to measure the wobbling motion of the Earth's rotational axis. Information obtained at these

stations corrects land-based geodetic measurements by providing an absolute coordinate reference in space, and is used to refine satellite orbit predictions and to monitor crustal motion over continental distances. The other two stations are located at Richmond, Florida, and Fort Davis, Texas.

In FY 88, geodetic surveys were performed at the following airports in support of the FAA's ADAM Program: Fitchburg, Great Barrington, Northampton, Palmer, Tewksbury, Gardner, Montague, Orange, and Stow.

In FY 89, 134 horizontal and 148 vertical control marks were recovered.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 6,446 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

In FY 90, one geodetic control station near Westford, Massachusetts was occupied as part of the Eastern Strain Network.

Nautical Charting. New editions of 22 existing nautical charts and a new edition of Coast Pilot 1 were scheduled for FY 90. The charts are listed below. There were new editions of two existing nautical charts and a new edition of Coast Pilot 1 published in FY 89.

Number	Scale	Name
13217	150000	Block Island
13227	10000	Fall River Harbor
13228	20000	Newport River and Approaches
13229SC	40000	South Coast of Cape Cod and Buzzards Bay
13230	40000	Buzzards Bay
13238	20000	Marthas Vineyard - Eastern Part
13241	40000	Nantucket Island
13242	10000	Nantucket Harbor
13246	80000	Cape Cod Bay
13248	20000	Chatham Harbor and Pleasant Bay
13249	20000	Provincetown Harbor
13250	40000	Wellfleet Harbor
13251	20000	Barnstable Harbor
13267	80000	Massachusetts Bay
13269	10000	Cohasset and Scituate Harbors
13270	25000	Boston Harbor
13272	10000	Boston Inner Harbor
13274SC	40000	Portsmouth Harbor to Boston Harbor

13275	25000	Salem Harbor, Lynn Harbor, and Manchester Harbor
13276	10000	Salem, Marblehead, and Beverly Harbors
13278	80000	Portsmouth to Cape Ann and Hampton Harbor
13279	20000	Ipswich Bay to Gloucester Harbor
13281	1000	Gloucester Harbor and Annisquam River

A new 1:20,000-scale chart (13232) of New Bedford Harbor is scheduled for publication in FY 90.

Aeronautical Charting. The following OC/ODS's were published in FY 90:

975 Pittsfield
5295 Plymouth

4. Planned C&GS Initiatives in the Commonwealth of Massachusetts During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 84 affiliates of NOAA/NGSDautomatic subscriber service in Massachusetts. This will also improve services for ad hoc requestors from the Commonwealth.

One geodetic control station will be occupied during the resurvey of the Eastern Strain Network.

Nautical Charting. New editions of 16 existing nautical charts are scheduled for publication in FY 92. These charts are:

Number	Scale	Name
13218	80000	Martha's Vineyard to Block Island
13221	40000	Narragansett Bay
13228	20000	Westport River and Approaches
13229SC	40000	South Coast of Cape Cod and Buzzards Bay
13230	40000	Buzzards Bay
13235	5000	Woods Hole
13236	20000	Cape Cod Channel and Approaches
13237	80000	Nantucket Sound and Approaches
13246	80000	Cape Cod Bay
13260	378838	Bay of Fundy to Cape Cod
13267	80000	Massachusetts Bay
13272	10000	Boston Inner Harbor
13274SC	40000	Portsmouth Harbor to Boston Harbor
13275	25000	Salem Harbor, Lynn Harbor, Manchester Harbor
13279	20000	Ipswich Bay to Gloucester Harbor
13282	20000	Newburyport Harbor and Plum Island Sound

Nautical Publications. A new edition of Coast Pilot 1 is scheduled for publication in FY 92.

In FY 92, NOAA Ship RUDE will continue wreck and obstruction investigations in Buzzards Bay and Nantucket Sound.

Aeronautical Charting. Four OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to 47 authorized National Ocean Service chart agents in the Commonwealth can be improved in FY 92.

5. Specific Issues of Interest to the Commonwealth of Massachusetts

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSDis cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Rhode Island

1. Name and Status of C&GS Programs for Rhode Island in FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 1,599 horizontal control points and 1,776 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Nautical Charting. There are 13 nautical charts and 4 bathymetric and topographic/bathymetric maps providing coverage of Rhode Island's waters.

During FY 91, seven new editions of nautical charts will be published for the state's coastal areas. These charts are:

Number	Scale	Name
12372SC	40000	Long Island Sound - Watch Hill to New Haven
13205	80000	Block Island Sound and Approaches
13215	40000	Block Island Sound
13218	80000	Marthas Vineyard to Block Island
13221	40000	Narragansett Bay
13225	10000	Providence Harbor
13226	20000	Mount Hope Bay

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of Rhode Island to the new NAD 83. In addition, LORAN-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

Nautical Publications. Rhode Island's coastal navigation information is contained in Coast Pilot 2. A new edition of Coast Pilot 2 is scheduled for publication in FY 91.

There are 27 nautical chart sales agents in this state. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

During FY 91, NOAA Ship HECK conducted wreck and obstruction investigations in Block Island Sound and NOAA Ship RUDE will continue in Rhode Island Sound.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

One OC/ODS is planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Rhode Island. Visual chart coverage includes one Sectional Chart and one Terminal Area Chart that is updated every 6 months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 4 Low and High Altitude Enroute Charts, and 29 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being updated for use during the transition between take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....0
Standard Terminal Arrival Chart (STAR's)..... 1
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 5

Category II ILS - special aircrew and aircraft certification required 1
Category III A ILS - special aircrew and aircraft certification required 0
Microwave Landing System (MLS) 0
Nonprecision Instrument Approach Charts:
Nondirectional Radio Beacon (NDB) 5
Very High Frequency Omnidirectional Range (VOR) 13
Area Navigation (RNAV) 2
Localizer (LOC) and Localizer Backcourse (LOCBC).....3
Localizer Directional Aid (LDA) 0
Simplified Directional Facility (SDF) 0
Visual Approach Procedures 0
Airport Diagrams 2
TOTAL 32

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Rhode Island. The IAP's are updated on a 56-day cycle.

BLOCK ISLAND STATE
NEWPORT STATE
NORTH CENTRAL STATE
QUONSET STATE
THEODORE FRANCIS GREEN STATE
WESTERLY STATE

The following is a list of Standard Instrument Departure (SID) charts available for the state of Rhode Island. The SID's are updated on a 56-day cycle.

THEODORE FRANCIS GREEN STATE

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Rhode Island. The STAR's are updated on a 56-day cycle.

NEWPORT STATE
NEW BEDFORD
NORTH CENTRAL STATE
QUONSET STATE
THEODORE FRANCIS GREEN STATE

2. Current and Future Funding of C&GS Programs in the State of Rhode Island

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Aeronautical Charting	159.3	1.8	159.3	1.8
OC Program	21.0	0.3	21.0	0.3
NOAA Ship HECK	-	-	940.0	10.0

Nautical Charting	16.9	0.3	22.5	0.4
TOTAL	197.2	2.4	1142.8	12.5

3. Significant Past C&GS Involvement in the State of Rhode Island

Geodesy. Two calibration base lines have been established in the State: North Central and Galilee. In FY 86 and 88, geodetic surveys were performed at five airports in support of the Federal Aviation Administration Airport Datum Monumentation (ADAM) program: Block Island, Newport, North Kingston, Pawtucket, and Westerly.

In FY 89, 189 horizontal and 223 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 1,227 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. New editions of eight existing nautical charts and a new edition of Coast Pilot 2 were scheduled for publication in FY 90. A new edition of Coast Pilot 2 was published in FY 89. The charts were:

Number	Scale	Name
12372SC	40000	Long Island Sound - Watch Hill to New Haven
13205	80000	Block Island Sound and Approaches
13214	20000	Fishers Island Sound
13217	15000	Block Island
13221	40000	Narragansett Bay
13223	20000	Narragansett Bay - Newport Harbor
13224	20000	Providence River and Narragansett Bay
13228	20000	Westport River and Approaches

Aeronautical Charting. No OC/ODS's were published in FY 90.

4. Planned C&GS Initiatives in the State of Rhode Island During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to C&GS's 22 state affiliates of the

NOAA/NGSD automatic subscriber service in Rhode Island. This will also improve services for ad hoc requestors from the state.

Nautical Charting. New editions of nine existing nautical charts are scheduled for publication in FY 92. These charts are:

Number	Scale	Name
13214	20000	Fishers Island Sound
13215	40000	Block Island Sound
13217	15000	Block Island
13218	80000	Marthas Vineyard to Block Island
13219	15000	Point Judith Harbor
13221	40000	Narragansett Bay
13223	20000	Narragansett Bay-Newport Harbor
13224	20000	Providence River and Narragansett Bay
13228	20000	Westport River and Approaches

Nautical Publications. A new edition of Coast Pilot 2 is scheduled for publication in FY 92.

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to five authorized National Ocean Service chart agents in the State can be improved during FY 92.

One OC/ODS is tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of Rhode Island

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Connecticut

1. Name and Status of (C&GS) Programs in Connecticut During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 8,408 horizontal control points and 3,768 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Nautical Charting. Nineteen nautical charts and four topographic/bathymetric maps provide coverage of Connecticut's coastline including the Housatonic and Connecticut Rivers.

During FY 91, eight new editions of nautical charts will be published for the state's coastal areas. These charts are:

Number	Scale	Name
12354	80000	Long Island Sound-Eastern Part
12367	20000	Greenwich Point to New Rochelle
12368	20000	Sherwood Point to Stamford Harbor
12372SC	40000	Long Island Sound - Watch Hill to New Haven
12374	20000	Duck Island to Madison Reef
13205	80000	Block Island Sound and Approaches
13211	20000	Long Island Sound - North Shore Niantic Bay
13215	40000	Block Island Sound

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of Connecticut to the new NAD 83. In addition, LORAN-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

In FY 91, NOAA Ship HECK completed wreck and obstruction investigations along the Connecticut coast.

During FY 91, Atlantic Hydrographic Party 2 continued with hydrographic surveys along the Connecticut coast.

Nautical Publications. Connecticut's coastal navigation information is contained in Coast Pilot 2. A new edition of Coast Pilot 2 is scheduled for publication in FY 91.

There are 40 nautical chart sales agents in this state. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the state.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS and SNS provide information for determining maximum take-off weights, building instrumentation approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

One OC/ODS is planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Connecticut. Visual chart coverage includes one Sectional Chart and two Terminal Area Charts that are updated every 6 months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 4 Low and High Altitude Enroute Charts, and 36 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being updated for use during the transition between the take-off

and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....3
Standard Terminal Arrival Chart (STAR's).....3
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 8
  Category II ILS - special aircrew and aircraft
                  certification required 1
  Category III A ILS - special aircrew and aircraft
                  certification required 0
  Microwave Landing System (MLS) 0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB) 5
  Very High Frequency Omnidirectional Range (VOR) 15
  Area Navigation (RNAV) 5
  Localizer (LOC) and Localizer Backcourse (LOCBC).....1
  Localizer Directional Aid (LDA) 1
  Simplified Directional Facility (SDF) 0
Visual Approach Procedures 0
Airport Diagrams 3
TOTAL 45

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Connecticut. The IAP's are updated on a 56-day cycle.

BRADLEY INTERNATIONAL
CHESTER
DANBURY MUNICIPAL
DANIELSON
GRISWOLD
GROTON-NEW LONDON
HARTFORD-BRAINARD
IGOR I. SIKORSKY MEMORIAL
MERIDEN MARKHAM MUNICIPAL
RENTSCHLER
TWEED-NEW HAVEN
WATERBURY-OXFORD
WHITE PLAINS
WILLIMATIC
WINDHAM

The following is a list of Standard Instrument Departure (SID) charts availabel for the State of Connecticut. The SID's are updated on a 56-day cycle.

BRADLEY INTERNATIONAL
IGOR I. SIKORSKY MEMORIAL
TWEED-NEW HAVEN

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Connecticut. The STAR's are updated on a 56-day cycle.

BRADLEY INTERNATIONAL

2. Current and Future Funding of C&GS Programs in the State of Connecticut

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Aeronautical Charting	191.8	2.2	191.8	2.2
OC Program	21.0	0.3	42.0	0.6
NOAA Ship HECK	470.0	5.0	-	-
Nautical Charting and Coast Pilot	19.4	0.4	10.0	0.2
TOTAL	702.2	7.9	243.8	3.0

3. Significant Past C&GS Involvement in the State of Connecticut

Geodesy. Five Calibration Base Lines have been established in the State: Danbury, Hampton, New Haven, South Windsor, and West Hartford. In FY 84, a 10-year reimbursable cooperative state-wide horizontal survey program was completed. In support of the North American Vertical Datum (NAVD 88) readjustment project, a total of 82 kilometers (km) of releveling were accomplished in Connecticut in FY 78. In FY 84-86 approximately 1,890 km were leveled under a reimbursable cooperative agreement with the Connecticut Department of Transportation. Geodetic surveys were performed at five airports in support of the Federal Aviation Administration Airport Datum Monumentation (ADAM) program in FY 86 and FY 88: Danielson, Madison, Meriden, Willimantic, and Chester.

In FY 89, 337 horizontal and 452 vertical control points were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,584 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. New editions of 10 existing nautical charts and a new edition of Coast Pilot 2 were scheduled for publication in FY 90. A new edition of Coast Pilot 2 was published in FY 89. The charts are:

Number	Scale	Name
12370	20000	Housatonic River and Milford Harbor
12371	20000	New Haven Harbor
12372SC	40000	Long Island Sound - Watch Hill to New Haven
12373	20000	Guilford Harbor to Parm River
13275	20000	Connecticut River - Long Island Sound to Deep River
12377	20000	Deep River to Harford
13205	80000	Block Island Sound and Approaches
13212	20000	Thames River - New London Harbor
13213	10000	New London Harbor and Vicinity
13214	20000	Fishers Island Sound

The NOAA Ship HECK continued side scan sonar surveys of wrecks and obstructions in Block Island Sound during FY 90.

During FY 90, Atlantic Hydrographic Party 2 began basic hydrographic surveys along the Connecticut coast.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

No OC/ODS's were published in FY 90.

4. Planned C&GS Initiatives in the State of Connecticut During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 32 state affiliates of NOAA/NGSDautomatic subscriber service in Connecticut. This will also improve services for ad hoc requestors from the State.

Nautical Charting. New editions of four existing nautical charts are scheduled for publication in FY 92. These charts are:

Number	Scale	Name
13212	20000	Thames River - New London Harbor
13213	10000	New London Harbor and Vicinity
13214	20000	Fishers Island Sound
13215	40000	Block Island Sound

A new edition of Coast Pilot 2 is scheduled for publication in FY 92.

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 22 authorized National Ocean Service chart agents in the State can be improved during FY 92.

Two OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of Connecticut

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for New York

1. Name and Status of C&GS' Programs for New York During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 18,203 horizontal control points and 23,735 vertical control points in New York State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS) ; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Nautical Charting. A total of 78 charts and 13 bathymetric and topographic/bathymetric maps are on issue for New York's coastline, the Hudson River and the New York Barge Canal. Twenty-six new editions of existing nautical charts will be issued in FY 91. These charts are:

Number	Scale	Name
12326	80000	Approaches to New York - Fire Island Light to Sea Girt
12327	40000	New York Harbor
12332	20000	Raritan River and Bay to New Brunswick
12333	15000	Kill Van Kull and Northern Arthur Kill
12341	10000	Days Point to George Washington Bridge
12345	10000	George Washington Bridge to Yonkers
12352SC	Various	Shinnecock Bay to East Rockaway Inlet
12354	80000	Long Island Sound - Eastern Part
12362	10000	Port Jefferson and Mt. Sinai Harbors
12365	20000	Long Island Sound - South Shore
12366	20000	Long Island Sound - North Shore and East River
12367	20000	Greenwich Point to New Rochelle
12401	15000	New York Lower Bay-Southern Part
12402	15000	New York Bay-Northern Part
13003	1200000	Cape Sable to Cape Hatteras
13205	80000	Block Island Sound and Approaches
13215	40000	Block Island Sound
14765	30000	Holmes Point to Dear Island
14788	40000	Oneida Lake-Lock 22 to Lock 23

14800	400000	Lake Ontario
14813	10000	Oswego Harbor
14815	10000	Rochester Harbor-Genesee River
14816	30000	Niagara Falls to Lake Ontario
14820	400000	Lake Erie
14822	80000	Approaches to Niagara River and Welland Canal
14823	80000	Sturgeon Point Twenty Mile Creek

In FY 91, Atlantic Hydrographic Party 2 continued basic surveys in western Long Island Sound.

Nautical Publications. New York's coastal and navigable waterway information is contained in Coast Pilots 2 and 3. New editions of these publications are planned for FY 91.

There are 164 nautical chart sales agents in this state. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in New York state. Visual chart coverage includes three Sectional Charts and one Terminal Area Chart which are updated every 6 months, and two World Aeronautical Charts that are updated annually. The New York City Helicopter Chart is now available, and a larger scale inset of higher density helicopter traffic is being proposed for the back of the chart. Instrument chart coverage includes 9 Low and High Altitude Enroute Charts and 183 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....10
Standard Terminal Arrival Charts (STAR's).....10
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....51
  Category II ILS - special aircrew and aircraft
    certification required.....4
  Category III A ILS - special aircrew and aircraft
    certification required.....1
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB).....29
  Very High Frequency Omnidirectional Range (VOR).....75
  Area Navigation (RNAV).....14
  Localizer (LOC) and Localizer Backcourse (LOCBC).....7
  Localizer Directional Aid (LDA).....0

Simplified Directional Facility (SDF).....0
Visual Approach Procedure.....2
Airport Diagrams.....12
TOTAL 215

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of New York. The IAP's are updated on a 56-day cycle.

ADIRONDACK
AKRON
ALBANY COUNTY
BROOKHAVEN
BROOKLYN CGAS (CLOSED)
BUFFALO AIRFIELD
CALVERTON NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (PECONIC RIVER)
CHAUTAUQUA COUNTY
CLINTON COUNTY
COLUMBIA COUNTY
CORTLAND COUNTY-CHASE FIELD
DANSVILLE MUNICIPAL
DUNKIRK MUNICIPAL
DUTCHESS COUNTY
EAST HAMPTON
EDWIN A. LINK FIELD-BROOME COUNTY
ELISHA PAYNE
ELIZABETH FIELD
ELMIRA/CORNING REGIONAL
GENESEE COUNTY
GREATER BUFFALO INTERNATIONAL
GREATER ROCHESTER INTERNATIONAL
HORNELL MUNICIPAL
JOHN F. KENNEDY INTERRNATIONAL
KAMP
LA GUARDIA
LE ROY
LONG ISLAND MACARTHUR
LT. WARREN EATON
MALONE-DUFORT
MASSENA INTERNATIONAL-RICHARDS FIELD
MONTAUK
MONTICELLO
NIAGARA FALLS INTERNATIONAL
OGDENSBURG INTERNATIONAL
OLEAN MUNICIPAL
ONEIDA COUNTY
ONEONTA MUNICIPAL
ORANGE COUNTY
OSWEGO COUNTY
PALMYRA AIRPARK
PENN YAN
PINE HILL
PLATTSBURGH AFB
POTSDAM MUNICIPAL-DAMON FIELD
RANDALL
REPUBLIC
SARATOGA COUNTY
SCHENECTADY COUNTY
SIDNEY MUNICIPAL
SKANEATELES AERO DROME
SKY ACRES
SKYPARK
STEWART INTERNATIONAL
STORMVILLE
SUFFOLK COUNTY
SULLIVAN COUNTY INTERNATIONAL
SYRACUSE HANCOCK INTERNATIONAL
TETERBORO
TOMPKINS COUNTY
TRI-CITIES
WARREN COUNTY
WATERTOWN NEW YORK INTERNATIONAL
WELLSVILLE MUNICIPAL AIRPORT-TARANTINE FIELD
WESTCHESTER COUNTY
WURTSBORO-SULLIVAN COUNTY

The following is a list of Standard Instrument Departure (SID) charts available for the State of New York. The SID's are updated on a 56-day cycle.

ALBANY COUNTY	LA GUARDIA
DUTCHESS COUNTY	LONG ISLAND MACARTHUR
GREATER BUFFALO INTERNATIONAL	POUGKEEPSIE
	REPUBLIC
GRUMMAN-BETHPAGE	STEWART INTERNATIONAL
JOHN F. KENNEDY INTERNATIONAL	WESTCHESTER COUNTY

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of New York. The STAR's are updated on a 56-day cycle.

GRUMMAN-BETHPAGE	LA GUARDIA
JOHN F. KENNEDY INTERNATIONAL	REPUBLIC
	WESTCHESTER COUNTY

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Five OC/ODS's are scheduled to be published in FY 91.

2. Current and Future Funding of C&GS Programs in New York

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
OC Program	105.0	1.5	105.0	1.5
Aeronautical Charting (Visual and IFR)	929.3	10.6	929.3	10.6
NOAA Ship RUDE	171.6	2.4	-	-
NOAA Ship HECK	495.0	5.5	-	-
Hydrographid Field Party 2	-	-	140.0	2.5
Nautical Charting	62.9	1.2	57.6	1.0
TOTAL	1763.8	21.2	1231.9	15.6

3. Significant Past C&GS Involvement in the State of New York for FY 90

Geodesy. Six calibration base lines have been established in New York: Albany, Campbell, Liverpool, Niagara, Rochester, and Valhalla. Vertical control surveys performed in the 1973-1978 period included 195 kilometers (km) along the Niagara River, 370 km along the Hudson River from Saratoga Springs to New York City, and surveys over the Adirondack Dome to detect elevation changes. The NGSD completed a high precision horizontal control survey for construction of a proton accelerator at the Brookhaven National Laboratory in Upton in FY 79. In support of the North American Vertical Datum (NAVD) readjustment project, a total of 1,330 kilometers (km) of releveling was accomplished in the State during the period FY 81-83.

Geodetic surveys were conducted at the following 28 airports in support of the Federal Aviation Administration's Airport Datum Monumentation (ADAM) Program during FY 88: Akron, Albion, Brockport, Buffalo Airpark, Cortland, Dansville, Durhamville, Endicott, Fishers Island, Fulton, Hamilton, Hornell, Hudson, Middletown, Millbrook, Montauk, Monticello, Norwick, Palmyra, Penn Yan, Potsdam, Red Hook, Saratoga, Shirley, Sidney, Skaneateles, Stormville, and Wurtsboro.

In FY 89, 279 horizontal and 700 vertical control marks were recovered in the state.

In FY 90 one geodetic control station near Watertown, New York, was occupied with a GPS receiver as part of the Eastern Strain Network. Relative gravity measurements were made at Fort Tryon Park, New York.

With conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 10,286 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Substantial local participation by principal marine organizations was involved in the development of the nautical chart plan for New York. This effort also is made for the frequent updating of the state's nautical charts and Coast Pilots. Two new charts and 13 new editions of existing nautical charts were issued in FY 88. In FY 87, there were 16 new editions of nautical charts and new editions of Coast Pilots 2 and 3. In FY 85, 13 nautical charts in New York Harbor were revised to support the Statue of Liberty Centennial Celebration on July 4, 1986.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of New York to the new NAD 83. In addition LORAN-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

In FY 90, Atlantic Hydrographic Party 2 began basic surveys in western Long Island Sound.

NOAA Ship HECK completed wreck and obstruction investigations in western Long Island Sound during FY 90.

Aeronautical Charting. The following OC/ODS's were publiched in FY 90:

10 Albany
411 Syracuse

4. Planned C&GS Initiatives for the State of New York During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to C&GS' 159 state affiliates of the NOAA/NOS automatic subscriber service in New York. This also will improve

services for ad hoc requestors for geodetic information from the state.

One geodetic control station was occupied during the resurvey of the Eastern Strain Network.

Nautical Charting. New editions of Coast Pilots 2 and 3 and new editions of 20 nautical charts are planned for FY 92. These charts are:

Number	Scale	Name
12327	40000	New York Harbor
12334	10000	New York Harbor, Upper Bay and Narrows
12335	10000	Hudson River, East River, Governors Island to 67th Street
12338	5000	Newtown Creek, East River
12339	10000	East River, Tallman Island to Queensboro Bridge
12341	10000	Days Point to George Washington Bridge
12350	20000	Jamaica Bay and Rockaway Inlet
12352SC	Various	Shinnecock Bay to East Rockaway Inlet
12354	80000	Long Island Sound-Eastern Part
12358	40000	Shelter Island Sound and Peconic Bay, Long Island
12363	80000	Long Island Sound-Western Part
12364SC	40000	Long Island Sound-West End
12366	20000	Long Island Sound-North Shore and East River
13003	1200000	Cape Sable to Cape Hatteras
13006	675000	West Quoddy Head to New York
13209	40000	Block Island Sound and Gardiners Bay - Long Island
13215	40000	Block Island Sound
14782	40000	Cumberland Head to Four Brothers Island
14783	40000	Four Brothers Island to Barber Point
14786RC	Various	New York State Barge Canal System
14791	60000	Cayuga and Seneca Lakes-Watkins Glen-Ithaca
14803	80000	Six Miles South of Stony Point to Port Bay
14820	400000	Lake Erie

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 68 authorized NOS chart agents in the state can be improved during FY 92.

Five OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to New York State

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public

agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information about C&GS Programs for New Jersey

1. Name and Status of C&GS Programs for New Jersey During FY 91

Geodesy. The Nautical Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 4,769 horizontal control points and 4,655 vertical control points in the state.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS) ; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the state in planning surveys and trains state personnel in geodetic survey operations and procedures.

Nautical Charting. Thirty-one nautical charts and 16 bathymetric and topographic/bathymetric maps cover the waterways and coastline of this State. During FY 91, 15 new editions of these charts will be issued. These charts are:

Name	Scale	Name
12312	40000	Wilmington to Philadelphia
12313	15000	Philadelphia and Camden Waterfronts
12316SC	40000	Little Egg Harbor to Cape May
12317	10000	Cape May Harbor
12323	80000	Sea Girt to Little Egg Inlet
12326	80000	Approaches to New York - Fire Island Light to Sea Girt
12327	40000	New York Harbor
12332	20000	Raritan River and Bay to New Brunswick
12333	15000	Kill Van Kull and Northern Arthur Kill
12337	20000	Passaic and Hackensack Rivers
12341	10000	Days Point to George Washington Bridge
12345	10000	George Washington Bridge to Yonkers
12401	15000	New York Lower Bay - Southern Part
13003	1200000	Cape Sable to Cape Hatteras

Nautical Publications. New Jersey's coastal and navigable waterway information is contained in Coast Pilots 2 and 3. New Editions of these publications are planned for FY 91.

There are 62 nautical chart sales agents in this state. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the state.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstrúction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Three OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of New Jersey. Visual chart coverage includes two Sectional Charts and two Terminal Area Charts that are updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 6 Low and High Altitude Enroute Charts and 80 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....6
Standard Terminal Arrival Chart (STAR's).....8
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 10

Category II ILS - special aircrew and aircraft certification required 1
Category III A ILS - special aircrew and aircraft certification required 0
Microwave Landing System (MLS) 0
Nonprecision Instrument Approach Charts:
Nondirectional Radio Beacon (NDB) 12
Very High Frequency Omnidirectional Range (VOR) 43
Area Navigation (RNAV) 10
Localizer (LOC) and Localizer Backcourse (LOCBC).....2
Localizer Directional Aid (LDA) 0
Simplified Directional Facility (SDF) 1
Visual Approach Procedures 1
Airport Diagrams 5
TOTAL 99

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of New Jersey. The IAP's are updated on a 56-day cycle.

AEROFLEX-ANDOVER
ALEXANDRIA
ALLAIRE
ATLANTIC CITY INTERNATIONAL
ATLANTIC CITY MUNICIPAL-
BADER FIELD
BLAIRSTOWN
CAMDEN COUNTY
LAKEWOOD
LINCOLN PARK
LINDEN
MANAHAWKIN
MARLBORO
MCGUIRE AFB
MERCER COUNTY
MILLVILLE MUNICIPAL
MORRISTOWN MUNICIPAL
NEWARK INTERNATIONAL
NORTHEAST PHILADELPHIA
OCEAN CITY MUNICIPAL
OLD BRIDGE
CAPE MAY COUNTY
CROSS KEYS
ESSEX COUNTY
FLYING W
GREENWOOD LAKE
HAMMONTON MUNICIPAL
KROELINGER
KUPPER
PRINCETON
RED LION
ROBERT J. MILLER AIR PARK
RUDY'S
SKY MANOR
SOLBERG-HUNTERDON
SOMERSET
SOUTH JERSEY REGIONAL
SUSSEX
TETERBORO
TRENTON-ROBBINSVILLE
WOODBINE MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of New Jersey. The SID's are updated on a 56-day cycle.

ATLANTIC CITY INTERNATIONAL
ATLANTIC CITY MUNICIPAL-
BADER FIELD
MERCER COUNTY
MORRISTOWN MUNICIPAL
NEWARK INTERNATIONAL
TETERBORO

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of New Jersey. The STAR's are updated on a 56-day cycle.

ESSEX COUNTY
KUPPER
MCGUIRE AFB
MORRISTOWN MUNICIPAL
NEWARK INTERNATIONAL
PRINCETON
SOLBERG-HUNTERDON
SOMERSET
TETERBORO

2. Current and Future Funding of C&GS Programs in the State of New Jersey

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Aeronautical Charting	460.2	5.2	460.2	5.2
OC Program	63.0	0.9	42.0	0.6
Strain Network	-	-	2.0	0.1
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time
NOAA Ship WHITING	440.0	7.3	-	-
NOAA Ship HECK	346.5	3.9	-	-
Nautical Charting	33.9	0.6	27.6	0.5
TOTAL	1423.6	18.4	611.8	6.9

3. Significant Past C&GS Involvement in the State of New Jersey for FY 90

Geodesy. Seven calibration base lines were established in the state: Andover, Burlington, Mercer, Middlesex, Millville, Morris, and Skillman. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 532 kilometers (km) of releveling was accomplished in the State during the period FY 79-81.

Geodetic surveys were performed at 25 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program in FY 87: Andover, Berlin, Blairstown, Bridgeport, Cross Keys, Hammonton, Lincoln Park, Linden, Manahawkin, Manville, Mantawan, Mount Holly, Old Bridge, Pittstown/Alexandria, Pittstown/Sky Manor, Princeton, Readington,

Robbinsville, Somerville, Sussex, Vincentown, Vineland/ Kroelinger, Vineland/Rudys, West Milford, and Woodbine.

In FY 89, 150 horizontal and 115 vertical control marks were recovered in the state.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,753 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Thirteen new editions were printed in FY 90 along with a new edition of Coast Pilot 3. One new edition of an existing nautical chart, and a new edition of Coast Pilot 3 were printed in FY 89. The charts are:

Number	Scale	Name
12214	80000	Cape May to Fenwick Island Light
12304	80000	Delaware Bay
12311	40000	Delaware River - Smyrna River to Wilmington
12312	40000	Wilmington to Philadelphia
12318	80000	Little Egg Inlet to Hereford Inlet Absecon
12324SC	40000	Sandy Hook to Little Egg Harbor
12326	80000	Approaches to New York - Fire I. Lt. to Sea Grit
12327	40000	New York Harbor
12331	15000	Raritan Bay and Southern Arthur Kill
12334	10000	New York Harbor, Upper Bay and Narrows
12335	10000	Hudson River - East River - Governors Island to 67th St.
12343	40000	New York to Wappinger Creek
12346	10000	Yonkers to Piermont

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of New Jersey to NAD 83. In addition, LORAN-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

Aeronautical Charting. The following OC/ODS's were published in FY 90.

285 Newark
890 Teterboro
5789 Atlantic City

4. Planned C&GS Initiatives in the State of New Jersey During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to C&GS' 53 state affiliates of NOAA/NOS automatic subscriber service in New Jersey. This will also improve services for ad hoc requestors from the state.

One geodetic control station will be occupied during the resurvey of the Eastern Strain Network.

Nautical Charting. Eighteen new editions of existing nautical charts are planned for publication during FY 90. A new edition of Coast Pilot 3 is published annually. The new chart editions are:

Number	Scale	Name
12304	80000	Delaware Bay
12311	40000	Delaware River - Smyrna River to Wilmington
12312	40000	Wilmington to Philadelphia
12313	15000	Philadelphia and Camden WAterfronts
12316SC	40000	Little Egg Harbor to Cape May
12318	80000	Little Egg Inlet to Hereford Inlet, Absecon
12324SC	40000	Sandy Hook to Little Egg Harbor
12327	40000	New York Harbor
12334	10000	New York Harbor, Upper Bay and Narrows
12335	10000	Hudson River, East River, Governors Island to 67th Street
12341	10000	Days Point to George Washington Bridge

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 59 authorized NOS chart agents in the state can be improved during FY 92.

Two OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of New Jersey

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information About C&GS Programs for Delaware

1. Name and Status of C&GS Programs for Delaware During FY 91

Geodesy. The Nautical Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 1,058 horizontal control points and 1,571 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS) ; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Beginning in FY 91, geodetic surveys to establish the Statewide High Accuracy GPS Network covering the State of Delaware containing 23 stations will be performed.

Nautical Charting. Ten nautical charts and eight topographic/ bathymetric maps cover Delaware's coastline and waterways. Two new editions of nautical charts will be issued in FY 91. These charts are:

Number	Scale	Name
12211	80000	Fenwick Island Light to Chincoteague Inlet
12312	40000	Wilmington to Philadelphia

There are 14 nautical chart sales agents in this state. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the state.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

No OC/ODS's are planned for publication in FY 91.

C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Delaware. Visual chart coverage includes one Sectional Chart and one Terminal Area Chart that is updated every 6 months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage included 6 Low and High Altitude Enroute Charts and 14 Instrument Approach Procedure Charts in one bound volume.

During FY 1991, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....0
Standard Terminal Arrival Chart (STAR's).....0
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 1
  Category II ILS - special aircrew and aircraft
                  certification required.....0
  Category III A ILS - special aircrew and aircraft
                  certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB) 2
  Very High Frequency Omnidirectional Range (VOR).....8
  Area Navigation (RNAV) 3
  Localizer (LOC) and Localizer Backcourse (LOCBC).....0
  Localizer Directional Aid (LDA) 0
  Simplified Directional Facility (SDF) 0
Visual Approach Procedures 0
Airport Diagrams 1
TOTAL. 15

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Delaware IAP's are updated on a 56-day cycle.

DELAWARE AIRPARK GREATER WILMINGTON- NEW CASTLE COUNTY	SUMMIT AIRPARK SUSSEX COUNTY

2. Current and Future Funding of C&GS Programs in the State of Delaware

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Surveys: 23 GPS Stations	34.5	0.8	-	-
Aeronautical Charting	97.4	1.1	97.4	1.1
OC Program	0	0	21.0	0.3
Nautical Charting and Coast Pilot	4.8	0.1	17.5	0.3
TOTAL	136.7	2.0	135.9	1.7

3. Significant Past C&GS Involvement in the State of Delaware

Geodesy. From 1956 to 1978, the Mason-Dixon lines (north-south and east-west boundaries of the States of Maryland and Delaware) were resurveyed by NGSD and monuments replaced where necessary. One Calibration Base Line was established in Dover. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 49 kilometers (km) of releveling was accomplished in the State during the period FY 79-80.

Geodetic surveys were performed at three airports in support of the Federal Aviation Administration's Airport Datum Monumentation (ADAM) program in FY 88: Dover, Middletown, and Rehobeth. In FY 89, six horizontal and nine vertical control points were recovered in the state.

In FY 90, a NGSD level crew observed approximately 7 kilometers of level lines near Wilmington and Smyrna to verify discrepancies between published height differences and recent observations by local users.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 679 horizontal control stations within

the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Six new editions of existing nautical charts and a new edition of Coast Pilot 3 were published in FY 90. In FY 89, a new edition of Coast Pilot 3 was published. The charts are:

Number	Scale	Name
12214	80000	Cape May to Fenwick Island Light
12216	40000	Cape Henlopen to Indian River Inlet Breakwater
12261	40000	Honga - Nanticoke - Wicomico Rivers
12277	20000	Chesapeake and Delaware Canal
12304	80000	Delaware Bay
12311	40000	Delaware River - Smyrna River to Wilmington

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of Delaware to NAD 83. In addition, LORAN-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

Aeronautical Charting. The following OC/ODS's were published in FY 90:

458 Wilmington
935 Georgetown

4. Planned C&GS Initiatives in the State of Delaware During FY 92.

Geodesy. A marketing plan is being developed in order to improve services provided to our 25 state affiliates of NOAA/NGSD automatic subscriber service in Delaware. This will also improve services for ad hoc requestors from the state.

Nautical Charting. Seven new editions of existing nautical charts are planned during FY 92. A new edition of Coast Pilot 3 will be published annually. The new chart editions are:

Number	Scale	Name
12211	80000	Fenwick Island Light to Chincoteague Inlet
12216	40000	Cape Henlopen to Indian River Inlet Breakwater

12261	40000	Honga - Nanticoke - Wicomico Rivers
12277	20000	Chesapeake and Delaware Canal
12304	80000	Delaware Bay
12311	40000	Delaware River - Smyrna River to Wilmington
12312	40000	Wilmington to Philadelphia

Aeronautical Charting. One OC/ODS is tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the ten authorized NOS chart agents in the state can be improved during FY 92.

5. Specific Issues of Interest to the State of Delaware

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information About C&GS Programs for Maryland

1. Name and Status of C&GS Programs for Maryland During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 8,906 horizontal control points and 8,951 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS) ; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the state in planning surveys and trains state personnel in geodetic survey operations and procedures.

Beginning in FY 91, geodetic surveys to establish the Statewide High Accuracy GPS Network covering the State of Maryland containing 60 stations will be performed. 160 km of leveling will be done to support the Statewide program.

Nautical Charting. There are 34 nautical charts and 59 bathymetric and topographic/bathymetric maps which provide coverage of Maryland's coastline and waterways, including the Chesapeake Bay and the Potomac River. New editions of nine nautical charts will be issued during FY 91. These charts are:

Number	Scale	Name
12211	80000	Fenwick Island Light to Chincoteague Inlet
12220	200000	Chesapeake Bay - Southern Part
12230	80000	Smith Point to Cove Point
12264	40000	Chesapeake Bay - Patuxent River and Vicinity
12273	80000	Sandy Point to Susquehanna River
12274	40000	Head of Chesapeake Bay
12281	15000	Baltimore Harbor
12284	10000	Patuxent River Solomons Island and Vicinity
12288	40000	Lower Cedar Point to Mattawoman Creek

Nautical Publications. Maryland's coastal and navigable waterway information is contained in Coast Pilot 3. A new edition of this publication is scheduled for printing in FY 91.

There are 44 nautical chart sales agents in this state. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the state.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

One OC/ODS is planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the state of Maryland. Visual chart coverage includes two Sectional Charts and two Terminal Area Charts that are updated every 6 months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 7 low and high altitude Enroute Charts and 45 Instrument Approach Procedure Charts in one bound volume.

Also, during FY 1991, the following instrument aeronautical charts are being produced for use during transition between take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing.

Standard Instrument Departure Charts (SID's).....0
Standard Terminal Arrival Chart (STAR's).....2
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 9

Category II ILS - special aircrew and aircraft certification required 1
Category III A ILS - special aircrew and aircraft certification required 0
Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
Nondirectional Radio Beacon (NDB) 6
Very High Frequency Omnidirectional Range (VOR) 20
Area Navigation (RNAV) 6
Localizer (LOC) and Localizer Backcourse (LOCBC).....3
Localizer Directional Aid (LDA) 0
Simplified Directional Facility (SDF) 0
Visual Approach Procedures 0
Airport Diagrams 2
TOTAL 49

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Maryland. The IAP's are updated on a 56-day cycle.

BALTIMORE-WASHINGTON INTERNATIONAL
CAMBRIDGE-DORCHESTER
CARROLL COUNTY
CLEARVIEW AIRPARK
COLLEGE PARK
CUMBERLAND MUNICIPAL
DULLES INTERNATIONAL
EASTON MUNICIPAL
FREDERICK MUNICIPAL
GARRETT COUNTY
MARTIN STATE
MONTGOMERY COUNTY AIRPARK
OCEAN CITY MUNICIPAL
SALISBURY-WICOMICO COUNTY REGIONAL
ST. MARY'S COUNTY
WASHINGTON COUNTY REGIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Maryland. The STAR's are updated on a 56-day cycle.

BALTIMORE-WASHINGTON INTERNATIONAL
MARTIN STATE

2. Current and Future Funding of C&GS Programs in the State of Maryland

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time
Geodetic Surveys:				
60 GPS Stations	90.0	2.0	-	-
160 km leveling	64.0	1.4	-	-
Strain Network (1 station)	-	-	2.0	0.1

Aeronautical Charting	250.8	2.9	250.8	2.9
OC Program	21.0	0.3	21.0	0.3
Nautical Charting	21.8	0.4	52.6	0.9
TOTAL	373.6	3.3	404.4	3.8

3. Significant Past C&GS Involvement in the State of Maryland

Geodesy. Five Calibration Base Lines were established in Maryland: Baltimore, Cambridge, Hagerstown, Howard County, and Leonardtown. In support of the North American Vertical Datum (NAVD) readjustment project, a total of 386 kilometers (km) of releveling was accomplished in the State during the period FY 79-84.

From 1956 to 1978, the Mason-Dixon lines (north-south and east-west boundaries of the States of Maryland and Delaware) were resurveyed and remonumented, where necessary, by the NGSD.

Geodetic surveys were performed at nine airports in support of the Federal Aviation Administration's Airport Datum Monumentation (ADAM) program in FY 86-88: Baltimore/Martin, Cambridge, Easton, Gaithersburg, Leonardtown, Oakland, Ocean City, Westminister/ Carroll County, and Westminister/Clearview.

In FY 89, 96 horizontal and 115 vertical control marks were recovered.

In FY 90 NGSD field parties completed several projects during FY 90. These included vertical control projects in Harford and Wicomico Counties, Silver Spring, and Maryland Point for a total of 800 km of leveling. The projects in Harford and Wicomico Counties provided vertical control to support Maryland's development of a Geographic Information System (GIS) and strengthen the NGRS. The projects in Silver Spring and at Maryland Point provided first order vertical control to support high precision projects. One geodetic control station at Maryland Point was occupied with a GPS receiver as part of the Eastern Strain Network. Absolute gravity observations were made at the National Institute of Science and Technology in Gaithersburg.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 5,255 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public.

The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. New editions of 21 existing charts and a new edition of Coast Pilot 3 were published in FY 90. In FY 89, editions of three nautical charts and a new edition of Coast Pilot 3 were published. The charts are:

Number	Scale	Name
12210	80000	Chincoteague Inlet to Great Machipongo Inlet
12228	40000	Pocomoke and Tangier Sounds
12231	40000	Tangier Sound - Northern Part
12233	40000	Chesapeake Bay to Piney Point
12260	197250	Chesapeake Bay - Northern Part
12261	40000	Honga - Nanticoke - Wicomico Rivers
12263	80000	Cove Point to Sandy Point
12264	40000	Chesapeake Bay - Patuxent River and Vicinity
12266	40000	Choptank River and Herring Bay
12268	40000	Choptank River - Cambridge to Greensboro
12270	40000	Chesapeake Bay - Eastern Bay and South River
12272	40000	Chesapeake Bay - Kent Island Narrows
12273	80000	Sandy Point to Susquehanna River
12277	20000	Chesapeake and Delaware Canal
12278	40000	Approaches to Baltimore Harbor
12281	15000	Baltimore Harbor
12282	25000	Severn and Magothy Rivers
12283	10000	Annapolis Harbor
12285SC	Various	Potomac River
12286	40000	Piney Point Lower Cedar Point
12287	20000	Potomac River - Dahlgren and Vicinity
12289	40000	Mattawoman Creek to Georgetown

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of Maryland to NAD 83. In addition, LORAN-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

Aeronautical Charting. The following OC/ODS's were published in FY 90:

977	Salisbury
5114	Hagerstown
5212	Gaithersburg
5222	Baltimore
5263	Cumberland

4. Planned C&GS Initiatives in the State of Maryland During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 84 state affiliates of NOAA/NGSD automatic subscriber service in Maryland. This will also improve services for ad hoc requestors from the state.

One geodetic control station will be occupied during the resurvey of the Eastern Strain Network.

Nautical Charting. New editions of 22 existing nautical charts are planned for FY 92. A new edition of Coast Pilot 3 is published annually. The new chart editions are:

Number	Scale	Name
12210	80000	Chincoteague Inlet to Great Machipongo Inlet
12211	80000	Fenwick Island Light to Chincoteague Inlet
12220	200000	Chesapeake Bay - Southern Part
12228	40000	Pocomoke and Tangier Sounds
12230	80000	Smith Point to Cove Point
12231	40000	Tangier Sound - Northern Part
12233	40000	Chesapeake Bay to Piney Point
12260	197250	Chesapeake Bay - Northern PArt
12261	40000	Honga, Nanticoke, Wicomico Rivers
12263	80000	Cove point to Sandy Point
12266	40000	Choptank River and Herring Bay
12270	40000	Chesapeake Bay - Eastern Bay and South River
12272	40000	Chesapeake Bay - Kent Island Narrows
12273	80000	Sandy Point to Susquehanna River
12274	40000	Head of Chesapeake Bay
12277	20000	Chesapeake and Delaware Canal
12278	40000	Approaches to Baltimore Harbor
12281	15000	Baltimore Harbor
12282	25000	Severn and Magothy Rivers
12283	10000	Annapolis Harbor
12285SC	Various	Potomac River
12289	40000	Mattawoman Creek to Georgetown

Aeronautical Charting. One OC/ODS is tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 46 authorized NOS chart agents in the state can be improved during FY 92.

5. Specific Issues of Interest to the State of Maryland

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Statewide High Accuracy GPS Network covering the State of Maryland contains 60 stations. Spacing between adjacent stations in the network will be approximately 30 kilometers. Connection of the network to the National Crustal Motion Network (NCMN) is planned through simultaneously observing selected network stations with the tracking stations of the Cooperative International GPS Network (CIGNET) during three consecutive observing days. Tentatively selected stations are at least four or five stations of the statewide network equally spaced throughout the state, one being NCMN station MD POINT OBS 1957 NO. 5 at the Very Long Baseline Interferometery (VLBI) site at Maryland Point; NCMN/Eastern Strain Network station T-007 DMATC 1971 at the nearby VLBI site at Greenbank, West Virginia; and Eastern Strain Network station BEARTOWN 2 near Beartown, Pennsylvania. In addition, selected stations of the Federal Geodetic Control Committee's (FGCC) GPS receiver testing network will be connected to the statewide network. The FGCC test network is a 11 station highly precise network in the Washington, D.C. metropolitan area, most of the stations being in the Maryland suburbs. The FGCC has conducted measurements with 14 different models of geodetic quality GPS receivers over the FGCC network since 1983.

This state network is being established as a cooperative activity between the Maryland Department of Transportation (MDOT) and the National Geodetic Survey Division (NGSD). Mr. Ralph Poust, NGSD geodetic advisor to the State of Maryland, is assisting the MDOT in developing and coordinating the State's effort in establishing the network. Field observations are scheduled to begin in Fall 1990.

Aeronautical Charting.

See Appendix A

Information About C&GS Programs for the Commonwealth of Virginia

1. Name and Status of C&GS Programs for the Commonwealth of Virginia During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 13,044 horizontal control points and 22,646 vertical control points in the Commonwealth.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

A facility is operated in the Commonwealth of Virginia for the testing, repair, and evaluation of geodetic support equipment by the NGSD at Corbin, Virginia, near Fredericksburg.

Nautical Charting. There are 35 nautical charts and 69 bathymetric and topographic/bathymetric maps on issue that cover portions of Virginia's coastal areas. During FY 91, 16 new editions of nautical charts will be issued for these areas. These charts are:

Number	Scale	Name
12200	416944	Cape May to Cape Hatteras
12205SC	Various	Cape Henry to Pamlico Sound
12207	80000	Cape Henry to Currituck Beach Light
12211	80000	Fenwick Island Light to Chincoteague Inlet
12220	200000	Chesapeake Bay - Southern Part
12221	80000	Chesapeake Bay Entrance
12224	40000	Cape Charles to Wolftrap
12230	80000	Smith Point to Cover Point
12237SC	Various	Rapahannock River, Corrotoman River
12238	40000	Mobjack Bay and York River Entrance
12241	20000	York River - Yorktown and Vicinity
12243	40000	York River - Yorktown to West Pt.
12245	20000	Hampton Roads
12254	20000	Cape Henry to Thimble Shoal Light
12256	20000	Chesapeake Bay - Thimble Shoal Channel
12288	40000	Lower Cedar Point to Mattawoman Creek

In FY 91, two bathymetric maps from data collected in FY 90 will be published. Thse maps will be the first multibeam survey maps produced for the east coast and will be centered around the Norfolk Canyon area. To date, approximately 2500 square nautical miles off Virginia's shores have been surveyed by NOAA multibeam.

Three hydrographic survey ships and Atlantic Hydrographic Party 2 are home ported at the Atlantic Marine Center in Norfolk. Atlantic Hydrographic Party 1 has made a permanent change of station from Norfolk to Corpus Christi, Texas.

During FY 91, NOAA Ship HECK will conduct follow-up wreck and obstruction investigations to previous WHITING survey work at the entrance to Chesapeake Bay in the Traffic Seperation Scheme.

There are 45 nautical chart sales agents in Virginia. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the Commonwealth.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

The C&GS provides aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Virginia. Visual chart coverage includes two Sectional Charts and one Terminal Area Chart that are updated every six months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 7 Low and High Altitude

Enroute Charts, and 112 Instrument Approach Procedure Charts in one bound volume.

During FY 91 the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....5
Standard Terminal Arrival Chart (STAR's).....0
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 15
  Category II ILS - special aircrew and aircraft
                  certification required 1
  Category III A ILS - special aircrew and aircraft
                  certification required 0
  Microwave Landing System (MLS) 1
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB) 33
  Very High Frequency Omnidirectional Range (VOR) 47
  Area Navigation (RNAV) 7
  Localizer (LOC) and Localizer Backcourse (LOCBC).....2
  Localizer Directional Aid (LDA) 1
  Simplified Directional Facility (SDF) 4
Visual Approach Procedures 1
Airport Diagrams 5
TOTAL 122

The following is a list of Instrument approach Procedure (IAP) charts available for the state of Virginia. The IAP's are updated on a 56-day cycle.

ACCOMACK COUNTY
BLACKSTONE AAF-ALLEN C. PERKINSON MUNICIPAL
BLUE RIDGE
BRIDGEWATER AIRPARK
CAMPBELL COUNTY
CHARLOTTESVILLE-ALBEMARLE
CHASE CITY MUNICIPAL
CHESAPEAKE MUNICIPAL
CHESTERFIELD COUNTY
CULPEPPER COUNTY
DANVILLE REGIONAL
DULLES INTERNATIONAL
EMPORIA MUNICIPAL
FARMVILLE MUNICIPAL
FRANKLIN MUNICIPAL-JOHN BEVERLY ROSE
GORDONSVILLE MUNICIPAL
GRUNDY MUNICIPAL
HAMPTON ROADS
HANOVER COUNTY MUNICIPAL
INGALLS FIELD
LEE COUNTY
LEESBURG MUNICIPAL - GODFREY FIELD
LONESOME PINE
LOUISA COUNTY/FREEMAN FIELD
LURAY CAVERNS
LYNCHBURG MUNICIPAL-PRESTON GLENN FIELD
MANASSAS MUNICIPAL-HARRY P. DAVIS FIELD
MECKLENBURG-BRUNSWICK REGIONAL
MOUNTAIN EMPIRE
NEW KENT COUNTY
NEW RIVER VALLEY
NORFOLK INTERNATIONAL
ORANGE COUNTY

PATRICK HENRY INTERNATIONAL
PETERSBURG MUNICIPAL
RICHMOND INTERNATIONAL-BYRD FIELD
ROANOKE REGIONAL/WOODRUM FIELD
SHANNON
SHENANDOAH VALLEY
SMITH MOUNTAIN LAKE
SUFFOLK MUNICIPAL
TANGIER ISLAND
TRI-CITY
TWIN COUNTY
VIRGINIA HIGHLANDS
VIRGINIA TECH
WAKEFIELD MUNICIPAL
WALLOPS FLIGHT FACILITY
WARRENTON-FAUQUIER
WASHINGTON NATIONAL
WEST POINT MUNICIPAL
WILLIAM M. TUCK
WILLIAMSBURG-JAMESTOWN
WINCHESTER REGIONAL

The following is a list of Standard Instrument Departure (SID) charts available for the Commonwealth of Virginia. The SID's are updated on a 56-day cycle.

CHARLOTTESVILLE-ALBEMARLE
NORFOLK INTERNATIONAL
PATRICK HENRY INTERNATIONAL
ROANOKE REGIONAL-WOODRUM FIELD

2. Current and Future Funding of C&GS Programs in the Commonwealth of Virginia

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Strain Network (1 Station)	-	-	2.0	0.1
OC Program	42.0	0.6	42.0	0.6
Aeronautical Charting	557.6	6.3	557.6	6.3
Nautical Charting and Coast Pilot	38.7	0.7	57.6	1.0
TOTAL	638.3	7.6	659.2	8.0

3. Significant Past C&GS Involvement in the Commonwealth of Virginia

Geodesy. Four Calibration Base Lines were established in the State: Belvoir, Corbin, Norfolk, and Virginia Tech. Three major geodetic projects were performed in the Commonwealth of Virginia. These include horizontal control surveys along the entire Interstate Highway system in the Commonwealth (1957-1966); a comprehensive horizontal control project in Fairfax County as part of a Washington, D.C., metropolitan area survey (1969-1976);

and an extensive vertical control survey performed in conjunction with the U.S. Army Corps of Engineers in the Chesapeake Bay area (1972).

In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,835 kilometers (km) of releveling was accomplished in the State during the period FY 79-85.

In 1978, a leveling test network consisting of two loops (approximately 38 km) was established in Fredericksburg. This network was leveled to test motorized leveling systems and precise trigonometric leveling systems.

Geodetic surveys were performed at 36 airports in support of the Federal Aviation Administration ADAM Program in FY 88: Abingdon, Ashland, Hanover, Blacksburg, Blackstone, Chase City, Bridgewater, Chesapeake, Chincoteague, Culpepper, Emporia, Farmville, Franklin, Fredericksburg, Galax, Gloucester, Gordonsville, Grundy, Leesburg, Luray, Marion, Martinsville, Melfa, Midland, Orange County, Pennington, Petersburg, Portsmouth, South Boston, Suffolk, Tangier Island, West Point, Williamsburg, Wakefield, Winchester, and Wise. In FY 89, 58 horizontal and 448 vertical control marks were recovered in the state.

In FY 90 one geodetic control station at Corbin was occupied by a GPS receiver as part of the Eastern Strain Network. In the Norfolk area, 7 km of 1st order leveling were completed.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 7,281 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Twenty new editions of nautical charts and new editions of Coast Pilot 3 and 4 were published in FY 90. In FY 89, there were 5 new editions of nautical charts and new editions of Coast Pilot 3 and 4 published. The new chart editions were:

Number	Scale	Name
12200	416944	Cape May to Cape Hatteras
12205SC	Various	Cape Henry to Pamlico Sound
12206SC	40000	Norfolk to Abemarle Sound
12210	80000	Chincoteague Inlet to Great Machipongo Inlet
12221	80000	Chesapeake Bay Entrance

12222	40000	Cape Charles to Norfolk Harbor
12224	40000	Cape Charles to Wolftrap
12225	80000	Wolftrap to Smith Point
12226	40000	Wolftrap to Pungoteague Creek
12228	40000	Pocomoke and Tangier Sounds
12231	40000	Tangier Sound - Northern Part
12233	40000	Chesapeake Bay to Piney Point
12235	40000	Rappahannock River Entrance
12237SC	40000	Rappahannock River - Corrotoman River
12238	40000	Mobjack Bay and York River Entrance
12241	20000	York River - Yorktown and Vicinity
12245	20000	Hampton Roads
12251	40000	Jamestown Island to Richmond
12253	20000	Norfolk Harbor to Elizabeth River
12254	20000	Cape Henry to Thimble Shoal Light
12256	20000	Chesapeake Bay - Thimble Shoal Channel
12260	197250	Chesapeake Bay - Northern Part
12285SC	Various	Potomac River
12286	40000	Piney Point Lower Cedar Point
12287	20000	Potomac River - Dahlgren and Vicinity
12289	40000	Mattawoman Creek to Georgetown
12300	400000	Nantucket Shoals to Five Fathom Bank

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage for the State of Virginia to NAD 83. In addition, LORAN-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.
In FY 90, NOAA Ship WHITING conducted hydrographic surveys at the entrance to the Chesapeake Bay in the Traffic Separation Scheme. NOAA ship HECK began follow-up wreck and obstruction investigations to previous WHITING survey work at the entrance to the Chesapeake Bay in the Traffic Separation Scheme. Multibeam surveys were conducted by NOAA Ships MT. MITCHELL and WHITING in the Exclusive Economic Zone (EEZ) off the coast of Virginia during FY 90.

The following OC/ODS's were published in FY 90:

291 Norfolk
347 Richmond
349 Roanoke
765 Charlottesville

4. <u>Planned C&GS Initiatives in the Commonwealth of Virginia During FY 92</u>

<u>Geodesy</u>. A marketing plan is being developed in order to improve services provided to our 131 affiliates of NOAA/NGSD automatic subscriber service in Virginia. This will also improve services for ad hoc requestors from the Commonwealth.

One geodetic control station will be occupied during the resurvey of the Eastern Strain Network.

Nautical Charting. Twenty-four new editions of nautical charts and new editions of Coast Pilot 3 and 4 are planned for FY 92. These nautical charts are:

Number	Scale	Name
12205SC	Various	Cape Henry to Pamlico Sound
12206SC	40000	Norfolk to Albemarle Sound
12210	80000	Chincoteague Inlet to Great Machipongo Inlet
12211	80000	Fenwick Island Light to Chincoteague Inlet
12220	200000	Chesapeake Bay - Southern Part
12221	80000	Chesapeake Bay Entrance
12222	40000	Cape Charles to Norfolk Harbor
12225	80000	Wolf Trap to Smith Point
12226	40000	Wolf Trap to Pungoteague Creek
12228	40000	Pocomoke and Tangier Sounds
12230	80000	Smith Point to Cove Point
12231	40000	Tangier Sound - Northern Part
12233	40000	Chesapeake Bay to Piney Point
12235	40000	Rappahannock River Entrance
12245	20000	Hampton Roads
12248	40000	James River - Newport News to Jamestown Island
12251	40000	Jamestown Island to Richmond
12253	20000	Norfolk Harbor to Elizabeth River
12254	20000	Cape Henry to Thimble Shoal Light
12260	197250	Chesapeake Bay - Northern Part
12285SC	Various	Potomac River
12289	40000	Mattawoman Creek to Georgetown
12300	400000	Nantucket Shoals to Five Fathom Bank

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 47 authorized NOS chart agents in the Commonwealth can be improved during FY 92.

Two OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the Commonwealth of Virginia

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in

adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for North Carolina

1. Name and Status of C&GS' Programs for North Carolina During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) Division (NGSD) maintains in the NGSD data base approximately 20,028 horizontal control points and 19,769 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under two separate cooperative agreements with the State, NGSD inspects State control surveys and provides field training as needed; and the State performs mark maintenance activities for NGSD.

Nautical Charting. There are 25 nautical charts, 12 bathymetric and topographic/bathymetric maps which provide coverage of the state's coastline, waterways, and offshore waters. During FY 91, eight new editions of these charts will be issued. These charts are:

Number	Scale	Name (IW = Intracoastal Waterway)
11534SC	40000	IW - Myrtle Sound to Casino Creek
11537	40000	Cape Fear River - Cape Fear to Wilmington
11541SC	40000	IW - Neuse River to Myrtle Sound
11545	40000	Beaufort Inlet - Southern Core Sound Lookout
11547	12500	Morehead City Harbor
11552	40000	Neuse River and Upper Bay River
12205SC	Various	Cape Henry to Pamlico Sound
12207	80000	Cape Henry to Currituck Beach Light

Nautical Publications. North Carolina's coastal and navigable waterway information is contained in Coast Pilot 4. A new edition of Coast Pilot 4 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, the C&GS is currently in the process of converting all of its nautical chart coverage for the state of North Carolina to the new North American Datum of 1983. In addition, Loran-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

There are 70 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

In, FY 91, shoreline mapping is scheduled along the coastline from Cape Hatteras to Cape Lookout. Nine shoreline maps will be produced. These maps will be produced using photogrammetric techniques and will provide the graphic representation of selected features measure from aerial photographs. Feature delineation will include the shoreline, alongshore coastal features, and a narrow zone of natural and man-made features inland from the shore. Shoreline maps are primarily used to support nautical chart maintenance and new chart construction, hydrographic surveys operations, and coastal management programs.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in North Carolina. Visual chart coverage includes four Sectional Charts and one Terminal Area Chart that are updated every six months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 5 Low and High Altitude Enroute Charts and 166 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of the flight and the landing:

Standard Instrument Departure Charts (SID's).....7
Standard Terminal Arrival Charts (STAR's).....8
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....24
  Category II ILS - special aircrew and aircraft
    certification required.....2
  Category III A ILS - special aircrew and aircraft
    certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB).....64
  Very High Frequency Omnidirectional Range (VOR).....58
  Area Navigation (RNAV).....8
  Localizer (LOC) and Localizer Backcourse (LOCBC).....6

Localizer Directional Aid (LDA).....0
Simplified Directional Facility (SDF).....4
Visual Approach Procedures.....0
Airport Diagrams.....6
TOTAL.....183

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of North Carolina. The IAP's are updated on a 56-day cycle.

ALBERT J. ELLIS
ANSON COUNTY
ASHE COUNTY
ASHEBORO MUNICIPAL
ASHEVILLE REGIONAL
BEAUFORT-MOREHEAD CITY
BILLY MITCHELL
BLAIR MUNICIPAL
BRUNSWICK COUNTY
BURLINGTON MUNICIPAL
CAUSEY
CHARLOTTE/DOUGLAS INTERNATIONAL
COLUMBUS COUNTY MUNICIPAL
CRAVEN COUNTY REGIONAL
DARE COUNTY REGIONAL
EDENTON MUNICIPAL
ELIZABETH CITY COAST GUARD AIR STATION/MUNICIPAL
ELKIN MUNICIPAL
FAYETTEVILLE REGIONAL/ GRANNIS FIELD
GASTONIA MUNICIPAL
GOLDSBORO-WAYNE MUNICIPAL
HALIFAX COUNTY
HARNETT COUNTY
HENDERSON FIELD
HENDERSON-OXFORD
HICKORY REGIONAL
HORACE WILLIAMS
JAARS-TOWNSEND
JOHNSTON COUNTY
KINSTON REGIONAL JETPORT AT STALLINGS FIELD
LAURINBURG-MAXTON
LEXINGTON MUNICIPAL
LINCOLN COUNTY
LUMBERTON MUNICIPAL
MARTIN COUNTY
MAY
MEADOW BROOK FIELD
MONROE
MOORE COUNTY
MORGANTON-LENOIR
MT. AIRY-SURRY COUNTY
MT. OLIVE MUNICIPAL
NEW HANOVER COUNTY
OCRACOKE ISLAND
P.B. RAIFORD
PERSON COUNTY
PIEDMONT TRIAD INTERNATIONAL
PITT-GREENVILLE
PLYMOUTH MUNICIPAL
RAEFORD MUNICIPAL
RALEIGH-DURHAM INTERNATIONAL
ROCKINGHAM COUNTY NC SHILOH
ROCKINGHAM-HAMLET
ROCKY MOUNT-WILSON
ROWAN COUNTY
RUTHERFORD COUNTY
SAMPSON COUNTY
SANFORD-LEE COUNTY BRICK FIELD
SHELBY MUNICIPAL
SILER CITY MUNICIPAL
SMITH REYNOLDS
STANLY COUNTY
STATESVILLE MUNICIPAL
TRI-COUNTY
TWIN LAKES
WARREN FIELD
WILKES COUNTY
WILSON INDUSTRIAL AIR CENTER

The following is a list of Standard Instrument Departure (SID) charts available for the state of North Carolina. The SID's are updated on a 56-day cycle.

CHARLOTTE/DOUGLAS INTERNATIONAL
PIEDMONT TRIAD INTERNATIONAL
RALEIGH-DURHAM INTERNATIONAL
SMITH-REYNOLDS

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of North Carolina. The STAR's are updated on a 56-day cycle.

CHARLOTTE/DOUGLAS INTERNATIONAL
RALEIGH-DURHAM INTERNATIONAL

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Four OC/ODS's are planned for publication in FY 91.

2. Current and Future Funding of C&GS Programs in North Carolina

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Strain Network (2 Stations)	-	-	4.0	0.1
OC Program	42.0	0.6	84.0	1.2
Aeronautical Charting	805.4	9.2	805.4	9.2

Nautical Charting	19.4	0.4	37.6	0.7
Strain Network Station (2)	-	-	4.0	0.1
TOTAL	866.8	10.2	935.0	11.3

3. Significant Past C&GS Involvement in the State of North Carolina

Geodesy. Seven calibration base lines were established in the State: Everetts, Hendersonville, Raeford, Raleigh, Rockingham-Hamlet, Statesville, and Wallace. In 1981, a vertical control survey project was performed for the Coastal Engineering Research Center, Fort Belvoir, VA in the Camden-Oregon Inlet, NC area to connect a National Ocean Service tide gage station to a North American Vertical Datum (NAVD) level line. In support of the North America Vertical Datum (NAVD) readjustment project, total of 1,469 kilometers (km) of releveling was accomplished in the State during the period FY 79-83.

In FY 86 and 87, geodetic surveys were conducted at 47 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program: Ahoskie, Albemarle, Beaufort, Burlington, Clinton, Edenton, Elkin, Erwin, Gastonia, Greensboro, Greenville, Hatteras, Kenansville, Lexington, Liberty, Lumberton, Manteo, Maxton, Mocksville, Monroe, Morgantown, Mt. Airy, Mt. Olive, Ocracoke Island, Oxford, Plymouth, Raeford, Reidsville, Roanoke Rapids, Rockingham, Rutherfordton, Salisbury, Sheboro, Shelby, Smithfield, Southport, Statesville, Wadesboro, Wallace, Washington, Waxhaw, West Jefferson, Whiteville, Wilkesboro, Williamston, and Wilson.

In FY 89, 1,202 horizontal and 384 vertical control marks were recovered in the State.

With conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 17,264 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Ten new editions of existing nautical charts were printed in FY 90, along with a new edition of Coast Pilot 4. Seven new editions of existing nautical charts, and a new edition of Coast Pilot 4 were printed in FY 89. These charts were:

Number	Scale	Name (IW = Intracoastal Waterway)
11534SC	40000	IW - Myrtle Sound to Casino Creek
11536	80000	Approaches to Cape Fear River
11537	40000	Cape Fear River - Cape Fear to Wilmington
11541SC	40000	IW - Neuse River to Myrtle Sound
11542	40000	New River
11544	80000	Portsmouth Island to Beaufort
11547	12500	Morehead City Harbor
11548	80000	Pamlico Sound - Western Part
11550	40000	Ocracoke Inlet and Northern Core Sound
11553SC	40000	IW - Ablemarle Sound to Neuse River
11554	40000	Pamlico River
11555	80000	Cape Hattaras - Wimble Shoals to Ocracoke Inlet
12200	416944	Cape May to Cape Hattaras
12204	80000	Currituck Beack Light to Wimble Shoals
12205SC	Various	Cape Henry to Pamlico Sound
12206SC	40000	Norfolk to Ablemarle Sound
13003	1200000	Cape Sable to Cape Hattaras

Aeronautical Charting. The following OC/OD's and SNS's were published in FY 90:

78 Charlotte (OC/ODS)
706 Hickory (OC/ODS)
5095 Beaufort (SNS)
5521 Greenville (OC/ODS)

4. Planned C&GS Initiatives for the State of North Carolina During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to the 209 state affiliates of the NOAA/NGSD automatic subscriber service in North Carolina. This also will improve services for ad hoc requestors from this State.

Geodetic Control Surveys are planned at survey stations in Charlotte and Rocky Mount as part of the U.S. Eastern Strain Network.

Nautical Charting. Fourteen new editions of existing nautical charts are scheduled for publication during FY 92. A new edition of Coast Pilot 4 is published annually. The chart editions are:

Number	Scale	Name (IW = Intracoastal Waterway)
11520	432720	Cape Hatteras to Charleston
11534SC	40000	IW - Myrtle Sound to Casino Creek
11535	80000	Little River Inlet to Winyah Bay Entrance
11539	80000	New River Inlet to Cape Fear

11541SC	40000	Neuse River to Myrtle Sound
11544	80000	Portsmouth Island to Beaufort
11545	40000	Beaufort Inlet - Southern Core Sound Lookout
11547	12500	Morehead City Harbor
11548	80000	Pamlico Sound - Western Part
11553SC	40000	IW - Ablemarle Sound to Neuse River
11555	80000	Cape Hatteras - Wimble Shoals to Ocracoke Inlet
12200	416944	Cape May to Cape Hattaras
12204	80000	Currituck Beack Light to Wimble Shoals
12205SC	Various	Cape Henry to Pamlico Sound
12206SC	40000	Norfolk to Ablemarle Sound

In FY 92, shoreline mapping of Albemarle Sound and Currituck Sound is schedule to begin. This effort will take about three years to complete.

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 60 authorized NOS chart agents in the state can be improved during FY 92.

Four OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest for the State of North Carolina

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

In 1988, C&GS conducted a cooperative project with the National Marine Fisheries Service to inventory the Submerged Aquatic Vegetation in Core and Pamlico Sounds, North Carolina. Aerial

photography can capture the location and extent of the submerged seagrass quickly and accurately. The Photogrammetry Branch secured approximately 225 linear miles of color photography at 1:24,000 scale over the project area. This photography will be used primarily for identification and extent of the seagrass. There was also approximately 150 linear miles of 1:50,000 scale color photography secured to help accurately position the off-shore seagrass beds. The Photogrammetry Branch has completed seven submerged aquatic vegetation maps. These maps accurately depict the location and broad type of seagrass beds. One composite map was prepared from the original seven maps to depict the entire study area and to review the methodology used in developing this study.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for South Carolina

1. Name and Status of C&GS' Programs for South Carolina During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 8,490 horizontal control points and 12,085 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement with South Carolina, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Nautical Charting. Twenty-one nautical charts and 15 bathymetric and topographic/bathymetric maps cover the waterways and coastline of this state. New editions of ten nautical charts will be issued during FY 91. These charts are:

Number	Scale	Name (IW = Intracoastal Waterway)
11480	449659	Charleston Light to Cape Canaveral
11507SC	40000	IW - Beafort River to St. Simons Sound
11514SC	20000	Savannah River - Savannah to Brier Creek
11519	40000	Parts of Coosaw and Broad Rivers
11520	432720	Cape Hatteras to Charleston
11522	40000	Stono and North Edisto Rivers
11524	20000	Charleston Harbor
11526	20000	Wando River - Upper Part
11532	40000	Winyah Bay
11534SC	40000	IW - Myrtle Sound to Casino Creek

Nautical Publications. South Carolina's coastal and navigable waterway information is contained in Coast Pilot 4. A new edition of Coast Pilot 4 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, the C&GS is currently in the process of converting all of its

nautical chart coverage for the state of South Carolina to the new North American Datum of 1983. In addition, Loran-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

There are 57 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in South Carolina. Visual chart coverage includes two Sectional Charts that are updated every six months and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 6 Low and High Altitude Enroute Charts and 97 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of the flight and the landing:

Standard Instrument Departure Charts (SID's).....0
Standard Terminal Arrival Charts (STAR's).....0
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....12
  Category II ILS - special aircrew and aircraft
                  certification required.....2
  Category III A ILS - special aircrew and aircraft
                  certification required.....0
  Microwave Landing System.....0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB).....40
  Very High Frequency Omnidirectional Range (VOR).....32
  Area Navigation (RNAV).....9
  Localizer (LOC) and Localizer Backcourse (LOCBC).....2
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....2
TOTAL 99

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of South Carolina. The IAP's are updated on a 56-day cycle.

AIKEN MUNICIPAL
ALLENDALE COUNTY
ANDERSON COUNTY
CHARLESTON AFB-INTERNATIONAL
BARNWELL COUNTY
BEAUFORT COUNTY
BERKELEY COUNTY

CHARLESTON EXECUTIVE
CHERAW MUNICIPAL
CHESTER MUNICIPAL
CLARENDON COUNTY
CLEMSON-OCONEE COUNTY
COLUMBIA METROPOLITAN
COLUMBIA OWENS DOWNTOWN
CONWAY-HORRY COUNTY
CORPORATE
DARLINGTON COUNTY
DILLON COUNTY
DONALDSON CENTER
FAIRFIELD COUNTY
FLORENCE REGIONAL
GEORGETOWN COUNTY
GRAND STRAND
GREENVILLE DOWNTOWN
GREENVILLE SPARTANBURG
GREENWOOD COUNTY
HARTSVILLE MUNICIPAL
HEMINGWAY-STUCKEY
HILTON HEAD
LAKE CITY MUNICIPAL-
C.J. EVANS FIELD
LANCASTER COUNTY-
MCWHIRTER FIELD
LAURENS COUNTY
MARION COUNTY
MARLBORO COUNTY
MYRTLE BEACH AFB
NEWBERRY MUNICIPAL
ORANGEBURG MUNICIPAL
PICKENS COUNTY
ROCK HILL MUNICIPAL-
BRYANT FIELD
SPARTANBURG DOWNTOWN MEMORIAL
ST. GEORGE MUNICIPAL
SUMTER MUNICIPAL
TWIN CITY
WALTERBORO MUNICIPAL
WILLIAMSBURG COUNTY
WOODWARD FIELD

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication FY 91.

2. Current and Future Funding of C&GS Programs in South Carolina

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing	80.0	1 part-time	80.0	1 part-time
Strain Network Station (1)	-	-	2.0	0.1
OC Program	42.0	0.6	42.0	0.6
Aeronautical Charting	439.6	5.0	439.6	5.0
Nautical Charting	24.2	0.4	30.1	0.5
TOTAL	585.8	6.5	593.7	6.7

3. Significant Past C&GS Involvement in the State of South Carolina

Geodesy. Thirteen calibration base lines were established in the State: Charleston, Chester, Clemson, Columbia, Conway, Greenville, Greenwood, Jasper, Lake City, Lancaster, Orangeburg, Rock Hill, and Spartanburg. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,625 kilometers (km) of releveling was accomplished in the State during the period FY 79-83.

In FY 86 and 87, geodetic surveys were performed at 31 airports in the State in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program.

During FY 89, 235 horizontal and 266 vertical control marks were recovered in the State.

In FY 89, 90 GPS points were established in Sumter County (40) and in the Edisto River Basin (50).

In FY 90 several geodetic control surveys were performed as follows: 73 stations were occupied in York County, and 78 stations were occupied in the South Edisto River Basin as part of a cooperative agreement between NGSD and the State to densify the National Geodetic Reference System. Two hundred fifty-seven survey stations were occupied and about 150 km of 1st order vertical control were performed along the coastal area most effected by the 1989 hurricane Hugo as part of an agreement between NGSD and the state. This control will be used by the South Carolina Coastal Council to aid in the rebuilding

effort. Two stations were occupied in the Charleston area as part of the U.S. Eastern Strain Network.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 5,436 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Thirteen new editions of existing nautical charts were printed in FY 90, along with a new edition of Coast Pilot 4. Four new editions of existing nautical charts, and a new edition of Coast Pilot 4 were printed in FY 89. The charts were:

Number	Scale	Name (IW = Intracoastal Waterway)
11480	449659	Charleston Light to Cape Canaveral
11507SC	40000	IW - Beafort River to St. Simons Sound
11512	40000	Savannah River to Wassaw Sound
11513	80000	St. Helena Sound to Savannah River
11514SC	20000	Savannah River - Savannah to Brier Creek
11515SC	20000	Savannah River - Brier Creek to Augusta
11516	40000	Port Royal Sound and Inland Passages
11517	40000	St. Helena Sound
11518SC	40000	IW - Casino Creek to Beaufort River
11521	80000	Charleston Harbor and Approaches
11522	40000	Stono and North Edisto Rivers
11524	20000	Charleston Harbor
11527	20000	Cooper River Above Goose Creek
11531	80000	Winyah Bay Entrance to Isle of Palms
11534SC	40000	IW - Myrtle Sound to Casino Creek

The entire coastline is now covered by modern hydrographic surveys conducted for nautical charting and bathymetric mapping.

Aeronautical Charting. The following OC/ODS was published in FY 90:

5124 Greer

4. Planned C&GS Initiatives for the State of South Carolina During FY 92

Geodesy. A marketing plan is being developed in order to improve service to C&GS' 57 state affiliates of the NOAA/NOS/NGSD automatic subscriber service in South Carolina. This also will improve services for ad hoc requestors from the State.

Geodetic control surveys are planned in the Charleston area as part of the U.S. Eastern Strain Network.

Nautical Charting. Twelve new editions of existing nautical charts are scheduled for publication during FY 92. A new edition of Coast Pilot 4 is published annually. The new editions are:

Number	Scale	Name (IW = Intracoastal Waterway)
11480	449659	Charleston Light to Cape Canaveral
11507SC	40000	IW - Beafort River to St. Simons Sound
11512	40000	Savannah River to Wassaw Sound
11513	80000	St. Helena Sound to Savannah River
11514SC	20000	Savannah River - Savannah to Brier Creek
11516	40000	Port Royal Sound and Inland Passages
11518SC	40000	IW - Casino Creek to Beaufort River
11520	432720	Cape Hatteras to Charleston
11521	80000	Charleston Harbor and Approaches
11531	80000	Winyah Bay Entrance to Isle of Palms
11534SC	40000	IW - Myrtle Sound to Casino Creek
11535	80000	Little River Inlet to Winyah Bay Entrance

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 32 authorized NOS chart agents in the State can be improved during FY 92.

Two OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to South Carolina

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

In FY 88, Federal financial assistance was awarded to the South Carolina Water Resources Commission to begin a multiyear research and demonstrative project using geographic information system techniques and public policy procedures to develop a natural resources decision system. The project will be conducted within the Edisto River System in the State. Technical standards and public policy formulation procedures will be chosen to promote the applicability of the decision system to South Carolina and other states. Financial assistance was also granted to the South Carolina Budget and Control Board to perform a multiyear, multipurpose mapping project in Sumter County.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for the State of Georgia

1. Name and Status of C&GS Programs for Georgia During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 16,873 horizontal control points and 18,774 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement with Georgia, a full-time resident geodetic advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

In support of the NGRS 135 kms of leveling will be performed.

Nautical Charting. There are 17 nautical charts, 40 bathymetric and topographic/bathymetric maps which will provide coverage of Georgia's coastline, waterways and offshore waters. During FY 91 eight new editions of these charts will be issued. These charts are:

Number	Scale	Name (IW = Intracoastal Waterway)
11480	449659	Charleston Light to Cape Canaveral
11502	80000	Doboy Sound to Fernandina
11503	20000	Fernandina Harbor to Kings Bay
11504	40000	St. Andrews Sound and Satilla River
11506	40000	St. Simons Sound Brunswick Harbor Turtle River
11507SC	40000	IW - Beafort River to St. Simons Sound
11509	80000	Tybee Island to Doboy Sound
11514SC	20000	Savannah River - Savannah to Brier

Nautical Publications. South Carolina's coastal and navigable waterway information is contained in Coast Pilot 4. A new edition of Coast Pilot 4 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, the C&GS is currently in the process of converting all of its nautical chart coverage for the state of Georgia to the new North American Datum of 1983. In addition, Loran-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

There are 22 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Three OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes 3 Sectional Charts and one Terminal Area Chart which is updated every 6 months, and three World Aeronautical Charts that is updated annually. Instrument chart coverage includes 8 Low and High Altitude Enroute Charts, and 181 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Charts (STAR's).....8
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....25
  Category II ILS - special aircrew and aircraft
                certification required.....3
  Category III A ILS - special aircrew and aircraft
                certification required.....2
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Non-Directional Radio Beacon (NDB).....55
  Very High Frequency Omni-directional Range (VOR).....59
  Area Navigation (RNAV).....18
  Localizer (LOC) and Localizer Backcourse (LOCBC).....19
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....4
TOTAL.....185

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Georgia. The IAP's are updated on a 56-day cycle.

ATHENS/BEN EPPS
BACON COUNTY
BALDWIN COUNTY
BAXLEY MUNICIPAL
BERRIEN COUNTY
BURKE COUNTY
BUSH FIELD
CAIRO-GRADY COUNTY
CALLAWAY GARDENS-HARRIS COUNTY
CAMILLA-MITCHELL COUNTY
CARTERSVILLE
CHEROKEE COUNTY
COBB COUNTY-NCCOLLUM FIELD
COCHRAN
COLUMBUS METROPOLITAN
CORNELIUS-MOORE FIELD
COVINGTON MUNICIPAL
CRISP COUNTY-CORDELE
DALTON MUNICIPAL
DANIEL FIELD
DECATUR COUNTY INDUSTRIAL AIRPARK
DEKALB-PEACHTREE
DONALSONVILLE MUNICIPAL
DOUGLAS MUNICIPAL
DR. C. P. SAVAGE SR.
EASTMAN-DODGE COUNTY
ELBERT COUNTY-PATZ FIELD
EMANUEL COUNTY
FALCON FIELD
FITZGERALD MUNICIPAL
FULTON COUNTY AIRPORT-BROWN FIELD
GLYNCO JETPORT
GREENE COUNTY AIRPARK
GRIFFIN-SPALDING COUNTY
GWINNETT COUNTY-BRISCOE FIELD
HABERSHAM COUNTY
HAZLEHURST
HENRY TIFT MYERS
HERBERT SMART DOWN TOWN
HOMERVILLE
JACKSON COUNTY
JEKYLL ISLAND
JESUP-WAYNE COUNTY
KAOLIN FIELD
LEE GILMER MEMORIAL
LEWIS B. WILSON
LIBERTY COUNTY
MADISON MUNICIPAL
MALCOLM-MCKINNON
METTER MUNICIPAL
MIDDLE GEORGIA REGIONAL
MONROE-WALTON COUNTY

MOULTRIE MUNICIPAL
NEWNAN-COWETA COUNTY
PERRY-FORT VALLEY
PETERSON FIELD
PICKENS COUNTY
PLANTATION AIRPARKI
REGINALD GRANT MEMORIAL
REIDSVILLE
RICHARD B. RUSSELL
SAVANNAH INTERNATIONAL
SOOUTHER FIELD
SOUTHWEST GA. REGIONAL
ST. MARYS
STATESBORO MUNICIPAL
TELFAIR-WHEELER
THE WILLIAM B. HARTSFIELD ATLANTA INTERNATIONAL
THOMASVILLE MUNICIPAL
THOMSON-MCDUFFIE COUNTY
TOCCOA RG LETOURNEAU FIELD
TOM B. DAVID FIELD
VALDOSTA REGIONAL
VIDALIA MUNICIPAL
H. H. BUD BARRON
WASHINGTON-WILKES COUNTY
WAYCROSS-WARE COUNTY
WEST GEORGIA REGIONAL
WINDER

The following is a list of Standard Instrument Departure (SID) charts available for the State of Georgia. The SID's are updated on a 56-day cycle.

THE WILLIAM B. HARTSFIELD ATLANTA INTERNATIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the State of Georgia. The STAR's are updated on a 56-day cycle.

COBB COUNTY-MCCOLLUM FIELD
DEKALB-PEACHTREE
DOBBINS AFB/ATLANTA NAS
FULTON COUNTY AIRPORT - BROWN FIELD
THE WILLIAM B. HARTSFIELD ATLANTA INTERNATIONAL

2. Current and Future Funding of C&GS Programs in Georgia

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 cost sharing)	80.0	1 part-time	80.0	1 part-time
Geodetic Surveys: NGRS Leveling (135 km)	54.0	1.2	-	-
Strain Network Station (1)	-	-	2.0	0.1
Aeronautical Charting	826.0	9.4	826.0	9.4
OC Program	63.0	0.9	63.0	0.9
Special Aeronautical NAVAID Surveys	63.0	1.5	-	-

Nautical Charting	19.4	0.4	17.5	0.3
TOTAL	1105.4	13.4	988.5	11.2

3. Significant Past C&GS Involvement in Georgia

Geodesy. Twenty-one Calibration Base Lines were established in the State: Albany (2), Athens, Atlanta, Augusta, Bainbridge, Brunswick, Cartersville, Columbus, Dalton, Eastman, Gainesville, LaGrange, Macon, Madray Springs, Milledgeville, Sandersville, Statesboro, Thomaston, Thomasville, and Tifton. A reimbursable Federal Geodetic Control Committee GPS project (14 points) was performed for the Defense Mapping Agency on the Fort Stewart Military Reservation in FY 84. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,280 kilometers (km) of releveling was accomplished in the State during the period FY 79-83. Cooperative reimbursable horizontal geodetic surveys were performed in Georgia during the period from FY 75 to FY 80. In FY 85-87, NGSD performed reimbursable GPS surveys for the Georgia Department of Transportation in the Savannah-Jesup (91 points) and Vidalia (136 points) areas.

Geodetic surveys in support of the Federal Aviation Administration's Airport Datum Monumentation (ADAM) program were completed in FY 86 and FY 87 at the following airports:

ALMA
AMERICUS
AUGUSTA
BAINBRIDGE
BAXLEY
CAIRO
CALHOUN
CAMILLA
CARROLLTON
CARTERSVILLE
CEDERTOWN
COCHRAN
CORDELE
CORNELIA
COVINGTON
DONALDSONVILLE
DOUGLAS
DUBLIN
EASTMAN
ELBERTON
FITZGERALD
GAINESVILLE
GRIFFIN
VIDALLIA
HAINESVILLE-JESUP
HAZLEHURST
HOMERVILLE
JEFFERSON
JEKYLL ISLAND
LA GRANGE
LAWRENCEVILLE
MACON
MCRAE
MILLEDGEVILLE
MONROE
NEWMAN
PEACHTREE CITY
PERRY
PINE MT
PLAINS
REIDSVILLE
SANDERVILLE
SWAINSBORO
THOMASVILLE
THOMSON
TIFTON
TOCCOA
WASHINGTON

WAYNESBORO
WINDER

In FY 89, 78 horizontal and 101 vertical control points were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 9,855 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Ten new editions of existing nautical charts were printed in FY 90, along with a new edition of Coast Pilot 4. Three new editions of existing nautical charts and a new edition of Coast Pilot 4 were printed in FY 89. The charts were:

Number	Scale	Name (IW = Intracoastal Waterway)
11480	449659	Charleston Light to Cape Canaveral
11489SC	40000	IW - St. Simons Sound to Tolomato River
11502	80000	Doboy Sound to Fernandina
11503	20000	Fernandina Harbor to Kings Bay
11507SC	40000	IW - Beafort River to St. Simons Sound
11508	40000	Altamaha Sound
11510	40000	Sapelo and Doboy Sound
11511	40000	Ossabaw and St. Catherines Sound
11512	40000	Savannah River and Wassaw Sound
11513	80000	St. Helena Sound to Savannah River
11514SC	20000	Savannah River - Savannah to Brier
11515SC	20000	Savannah River - Brier Creek to Augusta

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

8 Albany (OC/ODS)
26 Atlanta (OC/ODS)
243 Macon (OC/ODS)
983 Athens (OC/ODS)
5398 Tifton (OC/ODS)

4. Planned C&GS Initiatives in Georgia During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to C&GS' 94 state affiliates of the NOAA/NGSD automatic subscriber service in Georgia. This will also improve services for ad hoc requestors from the State.

A geodetic control survey is planned at a survey station in Atlanta as part of the U.S. Eastern Strain Network.

Nautical Charting. Seven new editions of existing nautical charts are scedule for publication during FY 92. A new edition of Coast Pilot 4 is published annually. The chart editions are:

Number	Scale	Name (IW = Intracoastal Way)
11480	449659	Charleston Light to Cape Canaveral
11489SC	40000	IW - St. Simons Sound to Tolomato River
11506	40000	St. Simons Sound Brunswick Harbor Turtle River
11507SC	40000	IW - Beaufort River to St. Simons Sound
11512	40000	Savannah River and Wassaw Sound
11513	80000	St. Helena Sound to Savannah River
11514SC	20000	Savannah River - Savannah to Brier

Aeronautical Charting. Three OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 55 authorized National Ocean Service chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Georgia

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable

cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services (C&GS) Programs for Florida

1. Name and Status of C&GS Programs for Florida During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 21,465 horizontal control points and 35,788 vertical control points in Florida.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative National Ocean Service (NOS) advisor agreement with the State's Department of Natural Resources, geodetic and tidal related activities are performed for the State.

In support of NGRS 960 kms of leveling will be performed.

Nautical Charting. There are 78 nautical charts, 118 bathymetric, topographic/bathymetric and fishing maps on issue which provide coverage of Florida's coastline, the St. Johns River and Lake Okeechobee waterways. During FY 91, new editions for 35 nautical charts will be issued. These charts are:

Number	Scale	Name (IW = Intracoastal Waterway)
411	2160000	Gulf of Mexico
11009	1200000	Cape Hatteras to Straits of Florida
11013	1200000	Straits of Florida and Approaches
11378SC	40000	IW - Santa Rosa Sound to Dauphin Island
11382	80000	Pensacola Bay and Approaches
11385SC	40000	IW - West Bay to Santa Rosa Sound
11390SC	40000	IW - East Bay to West Bay
11391	25000	St. Andrews Bay
11401	80000	Apalachicola Bay to Cape San Blas
11404SC	40000	IW - Carrabelle to Apalachicola Bay
11407	80000	Horseshoe Point to Rocks Island - Horseshoe Beach

11408	80000	Crystal River to Horseshoe Point Suwannee River
11412	80000	Tampa Bay and St. Joseph Sound
11414	40000	Tampa Bay - Southern Part
11426	80000	Estero Bay
11427SC	40000	IW - Fort Myers to Charlotte Harbor
11431	80000	East Cape to Mormon Key
11434	180000	Florida Keys - Sombrero Key to Dry Tortugas
11438	30000	Dry Tortugas - Tortugas Harbor
11441	30000	Key West Harbor and Approaches
11442	80000	Sombrero Key to Sand Key
11445	40000	IW - Habia Honda Key to Key West
11447	10000	Key West Harbor
11448	40000	IW - Big Spanish Channel to Johnson Key
11449	40000	Matecumbe to Bahia Honda Key
11451SC	80000	Miami to Marathon and Floria Bay
11460	466940	Cape Canaveral to Key West
11463	40000	IW - Elliot Key to Matecumbe
11465	40000	IW - Miami to Elliot Key
11466	80000	Jupiter Inlet to Fowey Rocks Palm Beach Channel
11467SC	40000	IW - West Palm Beach to Miami
11472SC	40000	IW - Palm Shores to West Palm Beach
11480	449659	Charleston Light to Cape Canaveral
11485SC	40000	IW - Tolomato River to Palm Shores
11491SC	20000	St. Johns River Atlantic Ocean to Jacksonville
11502	80000	Doboy Sound to Fernandina
11503	20000	Fernandina Harbor to Kings Bay

In FY 91, NOAA Ship HECK will begin wreck and obstruction investigations in the approaches to Pensacola, Florida.

Nautical Publications. Florida's coastal and navigable waterway information is contained in Coast Pilot 4 and 5. New editions of these two Coast Pilots are scheduled for publications in FY 91.

As part of a continuous maintenance and improvement program, the C&GS is currently in the process of converting all of its nautical chart coverage for the state of Florida to the new North American Datum of 1983. In addition, Loran-C lines of positioning have been added to all coastal and offshore series charts as an electronic aid to navigation.

There are 314 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations

Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Six OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes three Sectional Charts and two Terminal Area Charts that are updated every 6 months and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 4 Low and High Altitude Enroute Charts and 225 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing.

Standard Instrument Departure Charts (SID's).....18
Standard Terminal Arrival Charts (STAR's).....17
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....40
  Category II ILS - special aircrew and aircraft
    certification required.....4
  Category III A ILS - special aircrew and aircraft
    certification required.....1
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB).....44
  Very High Frequency Omni-Directional Range (VOR).....73
  Area Navigation (RNAV).....9
  Localizer (LOC) and Localizer Backcourse (LOCBC).....13
  Localizer Directional Aid.....0
  Simplified Directional Facility.....0

Visual Approach Procedures.....1
Airport Diagrams.....18
TOTAL 238

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Florida. The IAP's are updated on a 56-day cycle.

ALBERT WHITTED
BARTOW MUNICIPAL
BOB SIKES
CENTRAL FLORIDA REGIONAL
CHARLOTTE COUNTY
CRAIG MUNICIPAL
CROSS CITY
DADE-COLLIER (TRAINING AND TRANSITION)
DAYTONA BEACH REGIONAL
DELAND MUNICIPAL-SIDNEY H. TAYLOR FIELD
DESTIN-FORT WALTON BEACH
FERNANDINA BEACH MUNICIPAL
FLAGLER COUNTY
FORT LAUDERDALE EXECUTIVE
FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL
GAINESVILLE REGIONAL
HERNANDO COUNTY
IMMOKALEE
JACKSONVILLE INTERNATIONAL
KAY LARKIN
KENDALL-TAMIAMI EXECUTIVE
KEY WEST INTERNATIONAL
KEYSTONE AIRPARK
KISSIMMEE MUNICIPAL
LAKE CITY MUNICIPAL
LAKE WALES MUNICIPAL
LAKELAND MUNICIPAL
LEESBURG MUNICIPAL
MACDILL AFB
MARATHON
MARCO ISLAND
MARIANNA MUNICIPAL
MELBOURNE REGIONAL
MIAMI INTERNATIONAL
NAPLES MUNICIPAL
NEW SMYRNA BEACH MUNICIPAL
OCALA MUNICIPAL (JIM TAYLOR FIELD)
OPA LOCKA
ORLANDO EXECUTIVE
ORLANDO INTERNATIONAL
ORMOND BEACH MUNICIPAL
PAGE FIELD
PALM BEACH COUNTY PARK
PALM BEACH COUNTY GLADES
PALM BEACH INTERNATIONAL
PANAMA CITY-BAY COUNTY
PENSACOLA REGIONAL
PERRY-FOLEY
PETER O. KNIGHT
PLANT CITY MUNICIPAL
POMPANO BEACH AIRPARK
QUINCY MUNICIPAL
SARASOTA-BRADENTON
SEBRINGREGIONAL
SOUTHWEST FLORIDA REGIONAL
SPACE CENTER EXECUTIVE
ST. AUGUSTINE
ST. LUCIE COUNTY INTERNATIONAL
ST. PETERSBURG-CLEARWATER INTERNATIONAL
TALLAHASSEE COMMERCIAL
TALLAHASSEE REGIONAL
TAMPA BAY EXECUTIVE
TAMPA INTERNATIONAL
TRI COUNTY
VENICE MUNICIPAL
VERO BEACH MUNICIPAL
WILLISTON MUNICIPAL
WINTER HAVEN'S GILBERT

The following is a list of Standard Instrument Departure (SID) charts available for the State of Florida. The SID's are updated on a 56-day cycle.

DAYTONA BEACH REGIONAL
FORT LAUDERDALE EXECUTIVE
FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL

KENDALL-TAMIAMI EXECUTIVE
MELBOURNE REGIONAL
MAIAMI INTERNATIONAL
OPA LOCKA
ORLANDO EXECUTIVE
ORLANDO INTERNATIONAL
PALM BEACH INTERNATIONAL
POMPANO BEACH AIRPARKSARASOTA-BRADENTON
TAMPA INTERNATIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the State of Florida. The STAR's are updated on a 56-day cycle.

ALBERT WHITTED
BOCA RITON
CRAIG MUNICIPAL
FORT LAUDERDALE EXECUTIVE
FORT LAUDERDALE HOLLYWOOD INTERNATIONAL
HOMESTEAD AFB
KENDALL-TAMIAMI EXECUTIVE
KISSIMMEE MUNICIPAL
MACDILL AFB
MELBOURNE REGIONAL
MIAMI INTERNATIONAL
NASA SHUTTLE
NORTH PERRY
OPA LOCKA
ORLANDO EXECUTIVE
ORLANDO INTERNATIONAL
PALM BEACH INTERNATIONAL
PATRICK AFB
PETER O. KNIGHT
POMPANO BEACH AIRPARK
SANFORD REGIONAL
SARASOTA-BRADENTON
SPACE CENTER EXECUTIVE
ST. PETERSBURG-CLEARWATER INTERNATIONAL
TAMPA INTERNATIONAL
VENICE MUNICIPAL

2. Current and Future Funding of C&GS Programs in the State of Florida

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys:				
Strain Network Station (2)	-	-	4.0	0.1
NGRS Leveling (960 kms)	384.0	8.5	-	-
NOS Advisor (50-50 Cost Sharing)	100.0	2 part-time	100.0	2 part-time
Aeronautical Charting	973.5	11.1	973.5	11.1
OC Program	126.0	1.8	126.0	1.8
Hydrographic Field Party 2	133.5	3.0	-	-
Nautical Charting	89.5	1.7	132.5	2.4
TOTAL	1806.5	27.1	1336.0	16.4

3. Significant Past C&GS Involvement in the State of Florida

Geodesy. Twenty-one Calibration Base Lines were established in the State: Belle Glade, Boca Raton, Cape Coral, Fort Lauderdale, Gainesville, Holly Hill, Jacksonville, Lake City, Lake Wales, Miami, Naples, North Palm Beach, Ocala, Orlando, Panama City, Pensacola, St. Petersburg, Sebring, Tallahassee, Venice, and Vero Beach.

The NOS assisted in establishing primary horizontal geodetic control in Hillsborough County by training county personnel in field operations, data recordation, and computation procedures in FY 81; and performed special horizontal network adjustments for them in FY 84, FY 85, and FY 86. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,839 kilometers (km) of releveling was accomplished in the State during the period FY 79-90. NGSD established a Very Long Base Line Interferometry (VLBI) station at Richmond, Florida, which is part of a three-station Polar Motion Analysis by Radio Interferometry Survey Network. This network was established in the early 1980's to measure the wobbling motion of the Earth's rotational axis. Information obtained at these stations corrects land-based geodetic measurements by providing an absolute coordinate reference in space, and is used to refine satellite orbit predictions and to monitor crustal motion over continental distances. The other two stations are located at Westford, Massachusetts, and Fort Davis, Texas.

During FY 78-88, NGSD received and processed 32 vertical control survey projects for the FLDNR covering coastal areas and tidal station connections.

Geodetic surveys were conducted at the following airports in support of the FAA ADAM Program during FY 88: Bartow, Lake City, Perry, Brookville, Lake Wales, Plant City, Bunnell, Leesburg, Pompano Beach, Crestview, Marathon, Punta Gorda, Cross City, Marco Island, Quincy, Deland, Miami/Collier, Sebring, Destin, New Port Richey, St Augustine, Ft Pierce, Lormond Beach, Tallahassee, Immokalee, Pahokee ,Tampa, Kissimmee, Venice, West Palm Beach, and Winter Havens.

In FY 89, NGSD performed reimbursable cooperative geodetic control surveys at 32 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program; 35 airports for the Florida Department of Transportation (FLDOT); and established control at 78 new sites were selected by the Florida Department of Natural Resources (FLDNR). These surveys were performed to support the FLDNR and FLDOT corner restoration program underway to establish three-mile grid points as part of the development of a state-wide Geographic Information System. In support of this program, GPS surveys in Orange, Manatee, and Alachua counties were performed. This program is

expected to continue until all counties in Florida are completed. To support this effort, as well as other high accuracy GPS surveys, a homogeneous state-wide GPS reference network, with horizontal accuracy of Order B (8mm + 1:1,000,000), will be established.

In FY 89, 705 horizontal and 2,779 vertical control points were recovered in the state.

In FY 90 several geodetic control surveys were performed as follows: about 22 kms of vertical control was performed in Cape Canaveral as part of a joint test by NGSD and the Naval Surface Warfare Center to use pseudo-kinematic GPS observations and leveling to determine the deflection of the vertical in Cape Canaveral. A geodetic control survey was performed by GPS at Richmond and Gainesville as part of the U.S. Eastern Strain Network. Absolute gravity measurements were made at Richmond to support the establishment of vertical reference for the sea level monitoring portion of the NOAA's Climate and Global Change Program.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 15,481 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Thirty-seven new editions of existing nautical charts were printed in FY 90, along with new editions of Coast Pilots 4 and 5. Twenty-three new editions of existing nautical charts, and new editions of Coast Pilots 4 and 5 were printed in FY 89. These charts were:

Number	Scale	Name (IW = Intracoastal Waterway)
11013	1200000	Straits of Florida and Approaches
11378SC	40000	IW - Santa Rosa Sound to Dauphin Island
11382	80000	Pensacola Bay and Approaches
11383	30000	Pensacola Bay
11384	10000	Pensacola Bay Entrance
11389	80000	St. Joseph and St. Andrews Bays
11391	25000	St. Andrews Bay
11393SC	40000	IW - Lake Wimico to East Bay
11400	456394	Tampa Bay to Cape San Blas
11402SC	40000	Apalachicola Bay to Lake Wimico
11405	80000	Apalachee Bay
11409	80000	Anclote Keys to Crystal River
11411SC	40000	IW - Tampa Bay to Port Richey
11412	80000	Tampa Bay and St. Joseph Sound

11413	40000	Tampa Bay - Northern Part St. Petersburg Tampa
11414	40000	Tampa Bay - Southern Part
11420	470940	Habama to Tampa Bay
11424	80000	Lemon Bay to Passage Key Inlet
11425SC	40000	IW - Charlotte Harbor to Tampa Bay
11426	80000	Estero Bay to Lemon Bay - Charlotte Harbor
11427SC	40000	IW - Fort Myers to Charlotte Harbor
11428SC	80000	IW - Okeechobee Waterway - St. Lucie to Fort Myers
11429	80000	Chatham River to Clam Pass
11430SC	40000	Everglades National Park - Lostmans River to Wiggins
11432SC	50000	Everglades National Park - Shark River to Lostmans River
11433SC	50000	Everglades National Park - Whitewater Bay
11439	80000	Sand Key to Rebecca Shoal
11441	30000	Key West Harbor and Approaches
11447	10000	Key West Harbor
11450	180000	Fowey Rocks to American Shoal
11452	80000	Alligator Reef to Sombrero Key
11462	80000	Fowey Rocks to Alligator Reef
11465	40000	IW - Miami to Elliot Key
11466	80000	Jupiter Inlet to Fowey Rocks Palm Beach Channel
11467SC	40000	IW - West Palm Beach to Miami
11468	10000	Miami Harbor
11470	5000	Port Everglades
11472SC	40000	IW - Palm Shores to West Palm Beach
11474	80000	Bethel Shoal to Jupiter Inlet
11475	10000	Fort Pierce Harbor
11476	80000	Cape Canaveral to Bethel Shoal
11478	10000	Port Canaveral - Canaveral Barge Canal
11480	449659	Charleston Light to Cape Canaveral
11485SC	40000	IW - Tolomato River to Palm Shores
11486	80000	St. Augustine Light to Ponce De Leon Inlet
11488	40000	Amelia Island to St. Augustine
11489SC	40000	IW - St. Simons Sound to Tolomato River
11490	40000	Approaches to St. Johns River - St. Johns River Entrance
11491SC	20000	St. Johns River Atlantic Ocean to Jacksonville
11492	40000	Jacksonville to Crescent Lake
11495	40000	Dunns Creek to Lake Harney
11502	80000	Doboy Sound to Fernandina
11503	20000	Fernandina Harbor to Kings Bay

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

154	Ft Myers (OC/ODS)
305	Orlando (OC/ODS)
571	Orlando (OC/ODS)
606	Key West (OC/ODS)
625	St Petersburg (OC/ODS)
973	Gainesville (OC/ODS)
5048	Tallahassee (OC/ODS)
5055	Ocala (OC/ODS)
5349	Miami (OC/ODS)
5942	Ft Lauderdale (OC/ODS)
6757	Ft Myers (OC/ODS)

4. Planned C&GS Initiatives in the State of Florida During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS' 181 state affiliates of the NOAA/NOS automatic subscriber service in Florida. This also will improve services for ad hoc requestors from the State.

A geodetic control survey is planned for Richmond and Gainesville as part of the U.S. Eastern Strain Network.

Nautical Charting. Thirty-eight new editions of existing nautical charts are scheduled for publication during FY 92. New editions of Coast Pilots 4 and 5 are published annually. The chart editions are:

Number	Scale	Name (IW = Intracoastal Waterway)
11006	875000	Gulf Coast - Key West to Mississippi River
11383	30000	Pensacola Bay
11384	10000	Pensacola Bay Entrance
11385SC	40000	IW - West Bay to Santa Rosa Sound
11388	80000	Choctawatchee Bay
11389	80000	St. Joseph and St. Andrews Bays
11390SC	40000	IW - East Bay to West Bay
11393SC	40000	IW - Lake Wimico to East Bay
11400	456394	Tampa Bay to Cape San Blas
11401	80000	Apalachicola Bay to Cape San Blas
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11408	80000	Crystal River to Horseshoe Pouint Suwannee River
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11413	40000	Tampa Bay - Northern Part St. Petersburg Tampa
11414	40000	Tampa Bay - Southern Part
11420	470940	Havana to Tampa Bay
11425SC	40000	IW - Charlotte Harbor to Tampa Bay
11428SC	80000	IW - Okeechobee Waterway - St. Lucie to Fort Myers
11430SC	40000	Everglades National Park - Lostmans River to Wiggins
11434	180000	Florida Kays - Sombrero Key to Dry Tortugas
11442	80000	Sombrero Key to Sand Key
11445	40000	Bahia Honda Key to Key West
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11451SC	80000	Miami to Marathon and Florida Bay
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Aeronautical Charting. Six OC/ODS's are tenatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 137 authorized NOS chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Florida

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) had maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum

of 1929 (NGVD) 29 to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Statewide High Accuracy GPS Network covering the State of Florida contains 145 stations. Average station spacing is approximately 48 kilomters. In addition to the 145 main state network stations, another 107 existing stations, including bench marks, horizontal stations, and tide stations, were occupied for at least one observing session during the project. Two network stations, TIMER and FLNRC1, reference the network to the National Crustal Motion Network (NCMN). Station TIMER is at the Very Long Baseline Interferometry (VLBI)/Cooperative International GPS Tracking Network (CIGNET) site at Richmond U.S. Naval Observatory located at Perrine, and station FLNRC1, located at Gainesville, is in the US Eastern Strain Network. A third station, MC DAVID RM A, in western Florida was occupied in the 1990 occupied of the US Eastern Strain Network, thus providing an additional connection of the network to the NCMN.

The statewide network was established as a cooperative activity between the National Geodetic Survey Division (NGSD) and several Florida State agencies including the Florida Department of Transportation, Bureau of Aviation, and the Florida Department of Natural Resources. Mr. Ronnie Taylor, NGSD geodetic advisor to the State of Florida, coordinated the state's effort in establishing the network. Observations were performed during the period February through July 1989. Data reduction and analysis are presently in progress.

Nautical Charting. Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Alabama

1. Name and Status of C&GS Programs for Alabama During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 4,850 horizontal control points and 19,089 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains state personnel in geodetic surveying operations and procedures.

A calibration baseline will be established in Birmingham.

Nautical Charting. There are two topographic/bathymetric maps and 14 bathymetric maps which provide coverage of Alabama's marine waters. In addition are eight nautical charts which provide coverage of the State's waters. New editions of three nautical charts and a new edition of Coast Pilot 5 will be issued during FY 91. These charts are:

Number	Scale	Name
411	2160000	GULF OF MEXICO
11373	80000	MISSISSIPPI SOUND AND APPROACHES
11376	80000	MOBILE BAY-MOBILE SHIP CHANNEL

There are 14 Nautical Chart Sales Agents in Alabama. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and

other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

The following OC/ODS's and SNS's are scheduled for publication in FY 91:

50 Birmingham (OC/ODS)
277 Muscle Shoals (OC/ODS)

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes three Sectional Charts and one Terminal Area Chart which are updated every 6 months, and four World Aeronautical Charts that are updated annually. Instrument chart coverage includes 5 Low and High Altitude Enroute Charts and 90 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's)..... 1
Standard Terminal Arrival Charts (STAR's)..... 0
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....13
  Category II ILS - special aircrew and aircraft
                  certification required.....1
  Category III A ILS - special aircrew and aircraft
                  certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Non-directional Radio Beacon (NDB).....21
  Very High Frequency Omni-Directional Range (VOR).....48
  Area Navigation (RNAV) 3
  Localizer (LOC) and Localizer Backcourse (LOCBC).....4
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility.....0

Visual Approach Procedures.....0
Airport Diagrams.....6
TOTAL 97

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Alabama. The IAP's are updated on a 56-day cycle.

ANDALUSIA-OPP
ANNISTON METROPOLITAN
AUBURN-OPELIKA/
ROBERT G. PITTS
AUTAUGA COUNTY
BATES FIELD
BAY MINETTE MUNICIPAL
BESSEMER
BIRMINGHAM
BLACKWELL FIELD
BREWTON MUNICIPAL
BROOKLEY
BUTLER-CHOCTAW COUNTY
CENTRE MUNICIPAL
CLAYTON MUNICIPAL
CRAIG FIELD
DANNELLY FIELD
DOTHAN
ENTERPRISE MUNICIPAL
FAIRHOPE MUNICIPAL
FOLEY MUNICIPAL
FOLSOM FIELD
GADSDEN MUNICIPAL
GRAGG-WADE FIELD
GREENSBORO MUNICIPAL
HUNTSVILLE AIRPORT NORTH
HUNTSVILLE INTERNATIONAL-
CARL T. JONES FIELD
HUNT AHP
JACK EDWARDS
LAMAR COUNTY
LANETT MUNICIPAL
LAWSON AAF
MARION COUNTY
MERKLE FIELD -
SYLACAUGA MUNICIPAL
MIDDLETON FIELD
MONROE COUNTY
MUSCLE SHOALS
POSEY FIELD
PRYOR FIELD
ROUNDTREE FIELD
SAINT CLAIR COUNTY
SHELBY COUNTY
TALLADEGA MUNICIPAL
THE ALBERTVILLE MUNICIPAL-
THOMAS J BRUMLIK FIELD
THOMAS C. RUSSELL FIELD
TROY MUNICIPAL
TUSCALOOSA MUNICIPAL
TUSKEGEE MUNICIPAL
WALKER COUNTY-BEVILL FIELD
WEEDON FIELD
WETUMPKA MUNICIPAL
WHEELLESS

The following is a list of Standard Instrument Departure (SID) charts available for the State of Alabama. The SID's are updated on a 56-day cycle.

BIRMINGHAM

2. Current and Future Funding of C&GS Programs in Alabama

Program Items	FY 91 Current Funding $K	FY 91 Positions	FY 92 Future Funding $K	FY 92 Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time

Calibration baseline (1)	2.0	0.1	-	-
OC Program	42.0	0.6	42.0	0.6
Aeronautical Charting	418.9	4.8	418.9	4.8
EEZ Surveys - NOAA Ship MT MITCHELL, and NOAA Ship WHITING	--	--	1476.0	27.3
Nautical Charting	7.3	0.1	12.5	0.2
TOTAL	550.2	6.1	2029.4	33.4

3. Significant Past C&GS Involvement in Alabama

Geodesy. Eleven Calibration Base Lines were established in the State: Albertville, Auburn, Birmingham, Eufala, Gainesville, Huntsville, Mobile, Montgomery, Muscle Shoals, Pine Hill, and Tuscaloosa. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,160 kilometers (km) of releveling was accomplished in the State during the period FY 80-84. In FY 84, the primary tide station on Dauphin Island was tied to the National Vertical Geodetic Control Network.

Geodetic surveys in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) Program were completed in FY 87 at the following airports: Alabaster, Albertville, Alexander City, Andalusia, Auburn, Bay Minette, Bessemer, Brewton, Butler, Centre, Clanton, Clayton, Cullman, Demopolis, Dothan, Enterprise, Eufaula, Evergreen, Fairhope, Greenville, Haleyville, Hamilton, Hartsell, Huntsville, Jasper, Lanett, Mobile, Monroeville, Ozark, Pell City, Prattville, Sylacauga, Tuskegee, Vernon, and Wetumpka.

In FY 89, 43 horizontal and 24 vertical control points were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 1,951 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. A new edition of Coast Pilot 5 was not published during FY 90. New editions of three charts were published during FY 90. These charts are:

Chart No.	Chart Description
11006	GULF COAST-KEY WEST TO MISSISSIPPI RIVER
11374 SC	INTRACOASTAL WATERWAY-DAUPHIN ISLAND TO DOG KEYS PASS
11378 SC	INTRACOASTAL WATERWAY-SANTA ROSA SOUND TO DAUPHIN ISLAND

In FY 89, there were four new editions of nautical charts and a new edition of Coast Pilot 5 published for Alabama's near and offshore waters. These charts are:

Chart No.	Chart Description
411	GULF OF MEXICO
11373	MISSISSIPPI SOUND AND APPROACHES
11374 SC	INTRACOASTAL WATERWAY-DAUPHIN ISLAND TO DOG KEYS PASS
11376	MOBILE BAY-MOBILE SHIP CHANNEL
11378 SC	INTRACOASTAL WATERWAY-SANTA ROSA SOUND TO DAUPHIN ISLAND

Two bathymetric maps at 1:100,000 scale compiled from multibeam data were published in FY 90 and included an area due south of the coast of Alabama in water depths greater than 150 meters. These two maps are Chandeleur Valley and Mitchell Dome.

In FY 89, there were no topographic/bathymetric maps published for Alabama.

In FY 89, shoreline mapping was completed for the Fowl River Bay to Grand Bay section of coast. These maps were produced using photogrammetric techniques and instruments and will provide the graphic representation of selected features measured from aerial photographs. Feature delineation will include the shoreline, alongshore coastal features, and a narrow zone of natural and man-made features inland from the shore. Shoreline maps are primarily used to support nautical chart maintenance and new chart construction, hydrographic survey operations, and coastal management programs.

Aeronautical Charting. The following OC/ODS's and SNS's were published FY 90:

267	Mobile (OC/ODS)
272	Montgomery (OC/ODS)
487	Tuscaloosa (OC/ODS)
5488	Huntsville (OC/ODS)
5720	Troy (OC/ODS)

4. Planned C&GS Initiatives in Alabama During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS' 55 state affiliates of the NOAA/NOS automatic subscriber service in Alabama. This also will improve services for ad hoc requestors from the State.

Nautical Charting. The C&GS is planning to publish five new editions of nautical charts and a new edition of Coast Pilot 5 during the FY 92 period. These charts are:

Number	Scale	Name
11006	875000	GULF COAST-KEY WEST TO MISSISSIPPI RIVER
11373	80000	MISSISSIPPI SOUND AND APPROACHES
11374 SC	40000	INTRACOASTAL WATERWAY-DAUPHIN ISLAND TO DOG KEYS PASS
11376	80000	MOBILE BAY-MOBILE SHIP CHANNEL
11378 SC	40000	INTRACOASTAL WATERWAY-SANTA ROSA SOUND TO DAUPHIN ISLAND

New editions of Coast Pilot 5 are published yearly.

The multibeam surveys of the Exclusive Economic Zone (EEZ) will continue with one ship assigned to the area off the Alabama coast in FY 92. Special emphasis will be placed on defining the seafloor relief in an area of possible salt dome formations seaward of the Continental Shelf.

Aeronautical Charting. Two OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 32 authorized NOS chart agents can be improved during FY 92.

5. Specific Issues of Interest to the State of Alabama

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Mississippi

1. Name and Status of C&GS Programs for Mississippi During FY 91

Geodesy. The National Geodetic Sruvey Division (NGSD) maintains in the NGSD data base approximately 8,714 horizontal control points and 13,105 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement with Mississippi, a full-time resident geodetic advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Nautical Charting. There are two topographic/bathymetric, four bathymetric maps and four multibeam bathymetric maps which provide coverage of Mississippi's marine waters. There also are 10 nautical charts which provide coverage of the State's waters.

Five new chart editions and a new edition of Coast Pilot 5 are planned for FY 91. These charts are:

Number	Scale	Name
411	2160000	GULF OF MEXICO
11367SC	40000	INTRACOASTAL WATERWAY-WAVELAND TO CATAHOULA BAY
11371	80000	LAKE BORGNE AND APPROACHES
11373	80000	MISSISSIPPI SOUND AND APPROACHES
11375	20000	PASCAGOULA HARBOR

There are 11 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

The following OC/ODS's and SNS's are scheduled for publication in FY 91:

5132 Jackson (OC/ODS)

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the state. Visual chart coverage includes three Sectional Charts and one Terminal Area Chart that are updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 5 low and high altitude Enroute Charts and 112 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use in during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing.

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Chart (STAR's).....0
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 13
  Category II ILS - special aircrew and aircraft
                certification required 1
  Category III A ILS - special aircrew and aircraft
                certification required 1
  Microwave Landing System (MLS) 0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB) 35

Very High Frequency Omnidirectional Range (VOR) 45
Area Navigation (RNAV) 11
Localizer (LOC) and Localizer Backcourse (LOCBC).....6
Localizer Directional Aid (LDA) 0
Simplified Directional Facility (SDF) 0
Visual Approach Procedures 0
Airport Diagrams 1
TOTAL 114

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Mississippi. The IAP's are updated on a 56-day cycle.

BARRIER FIELD
BOBBY L. CHAIN MUNICIPAL
BOONEVILLE/BALDWYN
BROOKHAVEN-LINCOLN COUNTY
BRUCE CAMPBELL FIELD
C. A. MOORE
CLEVELAND MUNICIPAL
COLUMBIA-MARION COUNTY
COLUMBIA-LOWDNES COUNTY
COLUMBUS AFB
FLETCHER FIELD
GEORGE M. BRYAN
GOLDEN TRIANGLE REGIONAL
GREENVILLE MUNICIPAL
GREENWOOD-LEFLORE
GRENADA MUNICIPAL
GULFPORT-BILOXI REGIONAL
HARDY-ANDERS FIELD/
NACHEZ-ADAMS COUNTY
HAWKINS FIELD
HESLER-NOBLE FIELD
HOLLY SPRINGS-MARSHALL
COUNTY
INDIANOLA MUNICIPAL
JACKSON COUNTY
JACKSON INTERNATIONAL
JOHN BELL WILLIAMSKEY FIELD
KOSCIUSKO-ATTALA COUNTY
LOUISVILLE-WINSTON COUNTY
MCCHAREN FIELD
MCCOMB-PIKE COUNTY-
JOHN E. LEWIS FIELD
MONROE COUNTY
OKOLONA MUNICIPAL-
RICHARD STOVALL FIELD
OKTIBBEHA
OLIVE BRANCH
PICAYUNE-PEARL RIVER
COUNTY
PINE BELT REGIONAL
PRENTISS-JEFFERSON DAVIS
COUNTY
RIPLEY
ROSCOE TURNER
RULEVILLE-DREW
SELFS
STENNIS INTERNATIONAL
TUPELO MUNICIPAL-
C.D. LEMONS
TWINKLETOWN
UNIVERSITY-OXFORD
VICKSBURG MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the State of Mississippi. The SID's are updated on a 56-day cycle.

JACKSON INTERNATIONAL

2. Current and Future Funding of C&GS Programs in the State of Mississippi

	FY 91 Current Funding $K	FY 91 Positions	FY 92 Future Funding $K	FY 92 Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time
Strain Network Station (1)	-	-	2.0	0.1
Aeronautical Charting	504.5	5.7	504.5	5.7
OC Program	21.0	0.3	63.0	0.9
NOAA Ship RUDE	171.6	2.4	-	-
Nautical Charting	12.1	0.2	17.5	0.3
EEZ Surveys NOAA Ship MT. MITCHELL, and NOAA Ship WHITING	--	--	738.0	13.6
TOTAL	789.2	9.1	1405.0	21.1

3. Significant Past C&GS Involvement in the State of Mississippi

Geodesy. Three Calibration Base Lines were established in the State: Hattiesburg, Jackson, and Starkville. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 682 kilometers (km) of releveling was accomplished in the State during the period FY 80-84. Thirty-three Global Positioning Sytem stations were occupied and 174 km of leveling were accomplished in the Rena Lara, Mississippi/Memphis, Tennessee area for the Army Corps of Engineers Memphis District Office on a reimbursable basis in 1984. Along the Tennessee-Tombigbee Waterway for the Corps of Engineers Memphis District, 138 km of leveling were accomplished in 1985.

Geodetic control surveys in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program were completed in FY 86 at the following airports: Madison, Ocean Springs, and Raymond and in FY 88 at the following airports: Aberdeen, Bay St. Louis, Belzoni, Brookhaven, Clarksdale, Cleveland, Columbia, Corinth, Drew, Grenada, Holly Springs, Indianola, Kosciusko, Lexington, Louisville, Yazoo City, Marks, Okolona, Olive Branch, Picayune, Ripley, Starkville, and West Point.

In FY 89, 43 horizontal and 232 vertical control marks were recovered.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,669 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. A new edition of Coast Pilot 5 was not published during FY 90, however, new editions of four existing nautical charts were published for Mississippi's near and offshore waters. These charts are:

Chart No.	Chart Description
11006	GULF COAST-KEY WEST TO MISSISSIPPI RIVER
11371	LAKE BORGNE AND APPROACHES
11372 SC	INTRACOASTAL WATERWAY-DOG KEYS PASS TO WAVELAND
11374 SC	INTRACOASTAL WATERWAY-DAUPHIN ISLAND TO DOG KEYS PASS

In FY 89, there were new editions of five existing nautical charts and a new edition of Coast Pilot 5 published for Mississippi's near and offshore waters. These charts are:

Chart No.	Chart Description
411	GULF OF MEXICO
11367 SC	INTRACOASTAL WATERWAY-WAVELAND TO CATAHOULA BAY
11372 SC	INTRACOASTAL WATERWAY-DOG KEYS PASS TO WAVELAND
11374	INTRACOASTAL WATERWAY-DAUPHIN ISLAND TO DOG KEYS PASS
11375	PASCAGOULA HARBOR

Four new shoreline maps were registered during FY 88. They were:

Project No.	No. of Maps	Location
CM-8504	4	Ship Island Pass to Petit Bois Pass

The NOAA Ship RUDE completed wreck and obstruction investigations in the approaches to Biloxi and Pascagoula in early FY 90.

Two bathymetric maps at 1:100,000 scale compiled from multibeam data were published in FY 90 and included an area due south of the coast of Mississippi in water depths greater than 150 meters. These two maps are Chandeleur Valley and Mitchell Dome. Multi-beam surveys were conducted by the NOAA Ships WHITING and

MT. MITCHELL in the Exclusive Economic Zone (EEZ) off the coast of Mississippi during FY 88 and FY 89.

In FY 89, shoreline mapping was completed for entire coastal zone and some offshore islands, consisting of nine shoreline maps. These shoreline maps were produced using photogrammetric techniques and instruments and will provide the graphic representation of selected features measured from aerial photographs. Feature delineation includes the shoreline, alongshore coastal features, a narrow zone of natural and man-made features inland from the shore. Shoreline maps are primarily used to support nautical chart maintenance and new chart construction, hydrographic survey operations, and coastal management programs.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

206 Jackson (OC/ODS)
572 Greenville (OC/ODS)
5802 Brookhaven (SNS)

4. Planned C&GS Initiatives in the State of Mississippi During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS' 40 state affiliates of the NOAA/NOS automatic subscriber service in Mississippi. This also will improve services for ad hoc requestors from the State.

A geodetic control survey is planned to be performed by GPS in Columbia as part of the U.S. Eastern Strain Network.

Nautical Charting. The C&GS is planning to publish seven new editions of existing nautical charts, and a new edition of Coast Pilot 5 for FY 92. The charts are:

Number	Scale	Name
11006	875000	GULF COAST-KEY WEST TO MISSISSIPPI RIVER
11367 SC	40000	INTRACOASTAL WATERWAY-WAVELAND TO CATAHOULA BAY
11371	80000	LAKE BORGNE AND APPROACHES
11372 SC	40000	INTRACOASTAL WATERWAY-DOG KEYS PASS TO WAVELAND
11373	80000	MISSISSIPPI SOUND AND APPROACHES
11374 SC	40000	INTRACOASTAL WATERWAY-DAUPHIN ISLAND TO DOG KEYS PASS
11375	20000	PASCAGOULA HARBOR

The multibeam surveys of the Exclusive Economic Zone (EEZ) will resume with one ship assigned to the area off the Mississippi coast in FY 92. Special emphasis will be placed on defining the seafloor relief in an area of possible salt dome formations seaward of the Continental Shelf.

Aeronautical Charting. Three OC/ODS's and are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 17 authorized NOS chart agents can be improved during FY 92.

5. Specific Issues of Interest to the State of Mississippi

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Louisiana

1. Name and Status of C&GS Programs for Louisiana During FY 91

Geodesy. The National Geodetic Sruvey Division (NGSD) maintains in the NGSD data base approximately 12,448 horizontal control points and 22,974 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement with Louisiana, a full-time resident geodetic advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Nautical Charting. There are 11 topographic/bathymetric maps, 9 bathymetric maps, 4 fishing maps, and 12 multibeam bathymetric maps which provide coverage of Louisiana's marine waters. There also are 33 nautical charts which provide coverage of the State's waters.

New editions of 26 nautical charts and a new edition of Coast Pilot 5 will be issued during FY 91. The charts are:

Number	Scale	Name
411	2160000	GULF OF MEXICO
11330	250000	MERMENTAU RIVER TO FREEPORT
11331 SC	40000	INTRACOASTAL WATERWAY-ELLENDER TO GALVESTON BAY
11340	458596	MISSISSIPPI RIVER TO GALVESTON
11341	80000	CALCASIEU PASS TO SABINE PASS
11342	40000	SABINE PASS AND LAKE
11343	40000	SABINE AND NECHES RIVERS
11345	175000	NEW ORLEANS TO CALCASIEU RIVER-WEST SECTION
11348 SC	40000	INTRACOASTAL WATERWAY-FORKED ISLAND TO ELLENDER INCLUDING THE MERMENTAU RIVER, GRAND LAKE, AND WHITE LAKE

11349		80000	VERMILLION BAY AND APPROACHES
11351		80000	POINT AU FER TO MARSH ISLAND
11352		175000	NEW ORLEANS TO CALCASIEU RIVER-EAST SECTION
11354	SC	80000	INTRACOASTAL WATERWAY-MORGAN CITY TO PORT ALLEN
11355	SC	40000	INTRACOASTAL WATERWAY-CATAHOULA BAY TO WAX LAKE OUTLET
11356		80000	ISLES DERNIERS TO POINT AU FER
11358		80000	BARATARIA BAY AND APPROACHES
11359		50000	LOOP DEEPWATER PORT
11360		456394	CAPE ST GEORGE TO MISS PASSES
11361		80000	MISSISSIPPI RIVER DELTA
11363		80000	CHANDELEUR AND BRETON SOUNDS
11364		80000	MISSISSIPPI RIVER - VENICE TO NEW ORLEANS
11365	SC	50000	BARATARIA AND BAYOU LAFOURCHE WATERWAYS
11367	SC	40000	INTRACOASTAL WATERWAY-WAVELAND TO CATAHOULA BAY
11368		15000	NEW ORLEANS HARBOR
11369		80000	LAKE PONTCHARTRAIN AND MAUREPAS
11371		80000	LAKE BORGNE AND APPROACHES

There are 38 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

During FY 91, shoreline mapping will be conducted for the Calcasieu Lake entrance inshore to Lake Charles. The survey is depicted through 8 shoreline maps covering the project site. A photogrammetric survey will be initiated for the adjacent geographic area during FY 91 extending easterly to 92 degrees 30 minutes consisting of 10 shoreline maps. These maps were produced using photogrammetric techniques and instruments and will provide the graphic representation of selected features measured from aerial photographs. Feature delineation will include the shoreline, alongshore coastal features, and a narrow zone of natural and man-made features inland from the shore. Shoreline maps are primarily used to support nautical chart maintenance and new chart construction, hydrographic survey operations, and coastal management programs.

The NOAA ship RUDE continued with wreck and obstruction investigations in the approaches to Cameron in early FY 91.

During FY 91, NOAA will complete the surveys of that portion of the EEZ offshore from Louisiana deeper than 150 meters.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational

aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

The following OC/ODS's and SNS's are scheduled for publication in FY 91:

609	New Orleans (OC/ODS)
865	Lafayette (OC/ODS)
5037	Houma (OC/ODS)
6238	New Roads (SNS)

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the state. Visual chart coverage includes three Sectional Charts and one Terminal Area Chart that are updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 5 Low and High Altitude Enroute Charts and 129 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing.

Standard Instrument Departure Charts (SID's).....0
Standard Terminal Arrival Chart (STAR's).....1
Precision Instrument Approach Charts:
  Instrument Landing System (ILS) 18
  Category II ILS - special aircrew and aircraft
                certification required 2
  Category III A ILS - special aircrew and aircraft
                certification required 0
  Microwave Landing System (MLS) 0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB) 40
  Very High Frequency Omnidirectional Range (VOR) 53

Area Navigation (RNAV) 5
Localizer (LOC) and Localizer Backcourse (LOCBC).....11
Localizer Directional Aid (LDA) 0
Simplified Directional Facility (SDF) 0
Visual Approach Procedures 0
Airport Diagrams 8
TOTAL 138

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Louisiana. The IAP's are updated on a 56-day cycle.

ABBEVILLE MUNICIPAL
ACADIANA REGIONAL
BATON ROUGE METROPOLITAN-
RYAN FIELD
BEAUREGARD PARISH
BUNKIE MUNICIPAL
BYERLEY
CHENNAULT INDUSTRIAL AIRPARK
DAVID G. JOYCE
DE QUINCY INDUSTRIAL AIRPARK
DESOTO PARISH
ESLER REGIONAL
EUNICE
FALSE RIVER AIR PARK
GARDEN ISLAND BAY
SEAPLANE BASE
GEORGE R. CARR MEMORIAL
AIR FIELD
GRAND ISLE SEAPLANE BASE
GREATER ST. TAMMANY
HAMMOND MUNICIPAL
HARRY P. WILLIAMS MEMORIAL
HART
HOMER MUNICIPAL
HOUMA-TERREBONNE
JENNINGS
JONESBORO
LAFAYETTE REGIONAL
LAKE CHARLES REGIONAL
LAKEFRONT
LAKE CHARLES REGIONAL
MARKSVILLE MUNICIPAL
MCFILLEN AIRPARK
MINDEN-WEBSTER
MONROE REGIONAL
MOREHOUSE MEMORIAL
NATCHITOCHES REGIONAL
NEW ORLEANS INTERNATIONAL-
MOISANT FIELD
PORT SULPHUR SEAPLANE BASE
RAYVILLE MUNICIPAL
RUSTON MUNICIPAL
SHREVEPORT DOWNTOWN
SHREVEPORT REGIONAL
SLIDELL
SOUTHLAND FIELD
SPRINGHILL
ST. LANDRY PARISH-
AHART FIELD
THIBODAUX MUNICIPAL
VIVIAN
WELSH

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Louisiana. The STAR's are updated on a 56-day cycle.

NEW ORLEANS INTERNATIONAL
(MOISANT FIELD)

2. Current and Future Funding of C&GS Programs in the State of Louisiana

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 cost sharing)	80.0	1 part-time	80.0	1 part-time
Strain Network Station (1)	-	-	2.0	0.1
Aeronautical Charting	604.8	6.9	604.8	6.9
OC Program	63.0	0.9	84.0	1.2
NOAA Ship RUDE	429.0	6.0	-	-
Nautical Charting	62.9	1.2	57.6	1.0
EEZ Surveys NOAA Ship WHITING	2016.0	25.0	-	-
TOTAL	3255.7	40.5	828.4	9.7

3. Significant Past C&GS Involvement in the State of Louisiana

Geodesy. Eight Calibration Base Lines were established in the State: Abita Spring, Alexandria, Baton Rouge, Bossier City, Lafayette, Lake Charles, Monroe, and New Orleans. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 202 kilometers (km) of releveling was accomplished in the State during the period FY 80.

During FY 84, reimbursable leveling projects were performed for Jefferson Parish (76km), Plaqumines Parish (244km), and the NASA facility at Michoud (5km). A horizontal control survey using an inertial survey system was performed in 1979 to support coastal mapping and hydrographic surveys along the Gulf Coast.

Vertical control surveys were conducted in 1977 to serve as a basis for future studies at salt dome sites proposed for oil storage in Louisiana. Extensive vertical control surveys were conducted in 1976 at the request of the Army Corps of Engineers along the Mississippi River to provide data for flood control systems. Vertical control surveys were conducted for a Department of Energy/Louisiana Geological Survey geothermal development project in Southern Louisiana in 1982.

In FY 85, 12 GPS stations were established in the Darlington reservoir area for the Louisiana Department of Transportation.

Also, in FY 85, a reimbursable vertical control survey of approximately 230 kilometers was completed in Orleans Parish. The NGSD received and processed two Global Positioning System (GPS) horizontal control projects from the Louisiana Department of Transportation (25 stations) in the Darlington Reservoir area and in the Chandeleur Islands (27 stations) for fixed Aids to Navigation.

In FY 87, grant monies were awarded to Jefferson Parrish ($300,400) and the city of Sulphur ($187,689) in Calcasieu Parish to support the development of local Geocadastre projects. NGSD performed Global Positioning System (GPS) surveys (approximately 100 stations) in Jefferson and Calcasieu Parishes (Cities of Sulpha and Lake Charles) in support of these projects.

In FY 89, NGSD established 50 GPS points in Orleans Parish under a reimbursable cooperative agreement.

In FY 89, 167 horizontal and 230 vertical control points were recovered.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 6,491 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. In FY 90, a new edition of Coast Pilot 5 was not published; however, there were 15 new editions of nautical charts published for Louisiana's near and offshore waters. The charts are:

Chart No.	Chart Description (IW = Intracoastal Waterway)
11006	GULF COAST-KEY WEST TO MISSISSIPPI RIVER
11332	SABINE BANK
11341	CALCASIEU PASS TO SABINE PASS
11344	ROLLOVER BAYOU TO CALCASIEU PASS
11347 SC	CALCASIEU RIVER AND LAKE
11350 SC	IW-WAX LAKE OUTLET TO FORKED ISLAND
11351	POINT AU FER TO MARSH ISLAND
11357	TIMBALIER AND TERREBONNE BAYS
11358	BARATARIA BAY AND APPROACHES
11361	MISSISSIPPI RIVER DELTA
11363	CHANDELEUR AND BRETON SOUNDS
11369	LAKE PONTCHARTRAIN AND MAUREPAS
11370 SC	MISSISSIPPI RIVER-NEW ORLEANS TO BATON ROUGE
11371	LAKE BORGNE AND APPROACHES
11372 SC	INTRACOASTAL WATERWAY-DOG KEYS PASS TO WAVELAND

In FY 89, there were 20 new editions of nautical charts and a new edition of Coast Pilot 5 published for Louisiana's near and offshore waters. The charts are:

Chart No.	Chart Description
411	GULF OF MEXICO
11330	MERMENTAU RIVER TO FREEPORT
11331 SC	INTRACOASTAL WATERWAY-ELLENDER TO GALVESTON BAY
11340	MISSISSIPPI RIVER TO GALVESTON
11342	SABINE PASS AND LAKE
11345	NEW ORLEANS TO CALCASIEU RIVER-WEST SECTION
11347 SC	CALCASIEU RIVER AND LAKE
11348 SC	INTRACOASTAL WATERWAY-FORKED ISLAND TO ELLENDER
11349	VERMILLION BAY AND APPROACHES
11351	POINT AU FER TO MARSH ISLAND
11354 SC	INTRACOASTAL WATERWAY-MORGAN CITY TO PORT ALLEN
11355 SC	INTRACOASTAL WATERWAY-CATAHOULA BAY TO WAX LAKE OUTLET
11358	BARATARIA BAY AND APPROACHES
11360	CAPE ST GEORGE TO MISSISSIPPI PASSES
11361	MISSISSIPPI RIVER DELTA
11364	MISSISSIPPI RIVER-VENICE TO NEW ORLEANS
11365 SC	BARATARIA AND BAYOU LAFOURCHE WATERWAYS
11367 SC	INTRACOASTAL WATERWAY-WAVELAND TO CATAHOULA BAY
11368	NEW ORLEANS HARBOR
11372 SC	INTRACOASTAL WATERWAY-DOG KEYS PASS TO WAVELAND
11373	MISSISSIPPI SOUND AND APPROACHES

During FY 89, shoreline mapping was completed in the Louisiana/ Mississippi coastal boundary area. The map of this area was part of a 6 map project covering the boundary area easterly to Gulfport, Mississippi.

The NOAA Ship RUDE conducted wreck and obstruction investigations in the approaches to Cameron during FY 90.

During FY 88, FY 89, and FY 90 the NOAA Ships WHITING and MT. MITCHELL conducted multibeam surveys in the Exclusive Economic Zone (EEZ) offshore from Louisiana. Four maps from multibeam data have been published at 1:100,000 scale in the area offshore from Louisiana. These maps are Mitchell Dome, Chandeleur Valley, Mitchell Basin, and Researcher Basin. These maps cover approximately 6500 square nautical miles while another 16000 square nautical miles have been surveyed by multibeam methods offshore from Louisiana.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

392 Shreveport (OC/ODS)
5717 Patterson (OC/ODS)
6035 Hammond (OC/ODS)
6378 Bogalusa (SNS)

4. Planned C&GS Initiatives in the State of Louisiana During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS' 100 state affiliates of the NOAA/NOS automatic subscriber service in Louisiana. This also will improve services for ad hoc requestors from the State.

In FY 92, a geodetic control survey is planned to be performed by the Global Positioning System in Winnfield as part of the U.S. Eastern Strain Network.

Nautical Charting. The C&GS is planning to publish 23 new editions of nautical charts and a new edition of Coast Pilot 5 for FY 90. These charts are:

Number	Scale	Name
11006	875000	GULF COAST-KEY WEST TO MISSISSIPPI RIVER
11330	250000	MERMENTAU RIVER TO FREEPORT
11332	80000	SABINE BANK
11340	458596	MISSISSIPPI RIVER TO GALVESTON
11341	80000	CALCASIEU PASS TO SABINE PASS
11342	40000	SABINE PASS AND LAKE
11343	40000	SABINE AND NECHES RIVERS
11344	80000	ROLLOVER BAYOU TO CALCASIEU PASS
11347 SC	50000	CALCASIEU RIVER AND LAKE
11349	80000	VERMILLION BAY AND APPROACHES
11350 SC	40000	INTRACOASTAL WATERWAY-WAX LAKE OUTLET TO FORKED ISLAND
11356	80000	ISLES DERNIERS TO POINT AU FER
11357	80000	TIMBALIER AND TERREBONNE BAYS
11358	80000	BARTARIA BAY AND APPROACHES
11361	80000	MISSISSIPPI RIVER DELTA
11363	80000	CHANDELEUR AND BRETON SOUNDS
11364	80000	MISSISSIPPI RIVER-VENICE TO NEW ORLEANS
11365 SC	50000	BARATARIA AND BAYOU LAFOURCHE WATERWAYS
11367 SC	40000	INTRACOASTAL WATERWAY-WAVELAND TO CATAHOULA BAY
11370 SC	40000	MISSISSIPPI RIVER-NEW ORLEANS TO BATON ROUGE
11371	80000	LAKE BORGNE AND APPROACHES

11372 SC	40000	INTRACOASTAL WATERWAY-DOG KEYS PASS TO WAVELAND
11373	80000	MISSISSIPPI SOUND AND APPROACHES

In FY 92, a photogrammetric survey will be conducted in the Sabine Pass Inlet, Sabine Lake and Sabine River area. This survey will yield three maps depicting the Louisiana coastal zone region in conjunction with maps depicting the Texas coastal zone of the tangent geographic area. A photogrammetric survey of the Mermentau River to White Lake region of Louisiana will continue during FY 92 with completion scheduled for FY 93. This project will result in the production of 10 shoreline maps.

Aeronautical Charting. Four OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 28 authorized NOS chart agents can be improved during FY 92.

5. Specific Issues of Interest to the State of Louisiana

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Texas

1. Name and Status of C&GS (C&GS) Programs for Texas During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains approximately 28,267 horizontal control points and 65,781 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Nautical Charting. There are nine topographic/bathymetric maps and seven bathymetric maps which provide coverage of Texas' marine waters. There also are 32 nautical charts which provide coverage of the State's waters. New editions for 20 of these charts and a new edition of Coast Pilot 5 will be published during FY 91. The new editions are:

Number	Scale	Name
411	2160000	GULF OF MEXICO
11300	460732	GALVESTON TO RIO GRANDE
11301	80000	SOUTHERN PART OF LAGUNA MADRE
11302 SC	40000	INTRACOASTAL WATERWAY-LAGUNA MADRE-STOVER POINT TO PORT BROWNSVILLE
11306 SC	40000	INTRACOASTAL WATERWAY-LAGUNA MADRE-MIDDLE GROUND TO CHUBBY ISLAND
11307	80000	ARANSAS PASS TO BAFFIN BAY
11308 SC	40000	INTRACOASTAL WATERWAY-REDFISH BAY-MIDDLE GROUND-BAFFIN BAY
11313	80000	MATAGORDA LIGHT TO ARANSAS PASS
11316	80000	MATAGORDA BAY AND APPROACHES
11321	80000	SAN LUIS PASS TO MATAGORDA BAY
11322 SC	40000	INTRACOASTAL WATERWAY-GALVESTON BAY TO CEDAR LAKES
11323	80000	APPROACHES TO GALVESTON BAY
11326 SC	80000	GALVESTON BAY

11329	10000	HOUSTON SHIP CHANNEL-ALEXANDER ISLAND TO HOUSTON
11330	250000	MERMENTAU RIVER TO FREEPORT
11331 SC	40000	INTRACOASTAL WATERWAY-ELLENDER TO GALVESTON BAY
11340	458596	MISSISSIPPI RIVER TO GALVESTON
11341	80000	CALCASIEU PASS TO SABINE PASS
11342	40000	SABINE PASS AND LAKE
11343	40000	SABINE AND NECHES RIVERS

In FY 91, shoreline mapping will be completed for Matagorda Bay and vicinity resulting in the production of 10 shoreline maps. Shoreline mapping was also completed for the Mullet Island to Rio Grande River of the Texas coastal zone resulting in the production of six shoreline maps. Shoreline mapping for the Matagorda to West Bay coastal zone will be initiated in FY 91 with completion scheduled for FY 93 resulting in the production of 8 shoreline maps. These maps were produced using photogrammetric techniques and instruments and provide the graphic representation of selected features measured from aerial photographs. Feature delineation includes the shoreline, alongshore coastal features, and a narrow zone of natural and man-made features inland from the shore. Shoreline maps are primarily used to support nautical chart maintenance and new chart construction, hydrographic survey operations, and coastal management programs.

In FY 91, the NOAA Ship WHITING will begin side scan sonar surveys in the approaches to Corpus Christi and the NOAA Ship HECK will follow-up with wreck and obstruction investigations in FY 92.

Atlantic Hydrographic Party 2 will complete survey operations in Corpus Christi and Aransas Bays and begin to survey in Matagorda and Lavaca Bays during FY 91.

The NOAA Ships MT. MITCHELL and WHITING will begin multibeam surveys in the Exclusive Economic Zone (EEZ) offshore from Texas during FY 91.

There are 36 Nautical Chart Sales Agents in the State of Texas. These agents are typically small retail sporting goods and marine service businesses, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

The following OC/ODS's and SNS's are scheduled for publication in FY 91:

106	Dallas (OC/ODS)
622	Tyler (OC/ODS)
5138	Greenville (OC/ODS)
6917	(OC/ODS)

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes eight Sectional Charts and two Terminal Area Charts that are updated every 6 months, and four World Aeronautical Charts that are updated annually. Instrument chart coverage includes 11 Low and High Altitude Enroute Charts and 480 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....71
Standard Terminal Arrival Charts (STAR's).....18
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....74
  Category II ILS - special aircrew and aircraft
    certification required.....5
  Category III A ILS - special aircrew and aircraft
    certification required.....1
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB).....147
  Very High Frequency Omni-Directional Range (VOR).....187
  Area Navigation (RNAV).....38
  Localizer (LOC) and Localizer Backcourse (LOCBC).....27
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility.....0

Visual Approach Procedures.....1
Airport Diagrams.....17
TOTAL 586

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Texas. The IAP's are updated on a 56-day cycle.

A. L. MANGHAM JR. REGIONAL
ABILENE REGIONAL
ADDISON
ALICE INTERNATIONAL
ALPINE-CASPARIS MUNICIPAL
AMARILLO INTERNATIONAL
ANDRAU AIRPARK
ANDREWS COUNTY
ANGELINA COUNTY
ARANSAS COUNTY
ARLEDGE FIELD
ARLINGTON MUNICIPAL
ATHENS MUNICIPAL
ATLANTA MUNICIPAL
AUSTIN EXECUTIVE AIRPARK
AVENGER FIELD
BAY CITY MUNICIPAL
BAYTOWN
BEAUMONT MUNICIPAL
BEEVILLE MUNICIPAL
BERGSTROM AFB
BIG SPRING MCMAHON - WRINKLE
BIGGS AAF
BIRMINGHAM
BOURLAND FIELD
BOWIE MUNICIPAL
BRAZORIA COUNTY
BRENHAM MUNICIPAL
BRIDGEPORT MUNICIPAL
BROOKS COUNTY
BROWNSVILLE/SOUTH PADRE ISLAND INTERNATIONAL
BROWNWOOD MUNICIPAL
BRUCE FIELD
BURNET MUNICIPAL - KATE CRADDOCK FIELD
C. DAVID CAMPBELL FIELD-CORSICANA MUNICIPAL
CABANISS FIELD NALF
CADDO MILLS MUNICIPAL
CALDWELL MUNICIPAL
CALHOUN COUNTY
CASTROVILLE MUNICIPAL
CENTER MUNICIPAL
CHAMBERS COUNTY
CHEROKEE COUNTY
CHILDRESS MUNICIPAL
CLARENDON MUNICIPAL
CLARK FIELD MUNICIPAL
CLEBURNE MUNICIPAL
CLEVELAND MUNICIPAL
CLOVER FIELD
CLUCK RANCH
COLEMAN MUNICIPAL
COMMERCE MUNICIPAL
CORPUS CHRISTI INTERNATIONAL
COTULLA MUNICIPAL
COULTER FIELD
COX FIELD
CROSBYTON MUNICIPAL
CUDDIHY FIELD
CULBERSON COUNTY
CURTIS FIELD
DALHART MUNICIPAL
DALLAS NORTH
DALLAS-FORT WORTH INTERNATIONAL
DALLAS-LOVE FIELD
DAN E. RICHARDS MUNICIPAL
DAVID WAYNE HOOKS MEMORIAL
DECATUR MUNICIPAL
DEL RIO INTERNATIONAL
DEMING MUNICIPAL
DENTON MUNICIPAL
DEVINE MUNICIPAL
DIMMIT COUNTY
DRAUGHON-MILLER MUNICIPAL
DUMAS MUNICIPAL
EAGLE LAKE
EASTERWOOD FIELD
EASTLAND MUNICIPAL
EDWARDS COUNTY
EL PASO INTERNATIONAL
ENNIS MUNICIPAL
FOLLETT-LIPSCOMB COUNTY
FORT STOCKTON-PECOS COUNTY
FORT WORTH ALLIANCE

FORT WORTH MEACHAM
FORT WORTH SPINKS
GAINES COUNTY
GAINESVILLE MUNICIPAL
GALLUP MUNICIPAL
GARNER FIELD
GEORGETOWN MUNICIPAL
GIDDINGS-LEE COUNTY
GILLESPIE COUNTY
GILMER-UPSHUR COUNTY
GLADEWATER MUNICIPAL
GOODFELLOW AFB
GRAHAM MUNICIPAL
GRANBURY MUNICIPAL
GRAND PRAIRIE MUNICIPAL
GRAYSON COUNTY
GREGG COUNTY
GRUVER MUNICIPAL
HALE COUNTY
HARRISON COUNTY
HASKELL MUNICIPAL
HAWTHORNE FIELD
HEMPHILL COUNTY
HEREFORD MUNICIPAL
HIGGINS-LIPSCOMB COUNTY
HONDO MUNICIPAL
HOOD AAF
HOUSTON GULF
HOUSTON HULL
HOUSTON INTERCONTINENTAL
HOUSTON SOUTHWEST
HUNTSVILLE MUNICIPAL
HUTCHINSON COUNTY
INC.
JACKSON COUNTY
JASPER COUNTY-BELL FIELD
JEFFERSON COUNTY
JIM HOGG COUNTY
JOHNSON CITY
JONES FIELD
KARNES COUNTY
KERRVILLE MUNICIPAL-
LOUIS SCHREINER FIELD
KICKAPOO DOWNTOWN AIRPARK
KILLAM AND HURD
KILLEEN MUNICIPAL
KIMBLE COUNTY
KLEBERG COUNTY
LA PORTE MUNICIPAL
LAGO VISTA BAR-K AIRPARK
LAKEWAY AIRPARK
LAMESA MUNICIPAL
LAMPASAS
LANCASTER
LAREDO INTERNATIONAL
LAUGHLIN AFB
LA PORTE MUNICIPAL
LEVELLAND MUNICIPAL
LIBERTY MUNICIPAL
LITTLEFIELD MUNICIPAL
LIVE OAK COUNTY
LLANO MUNICIPAL
LOCKHART MUNICIPAL
LUBBOCK INTERNATIONAL
LUCK FIELD
MADISONVILLE MUNICIPAL
MAJORS
MARFA MUNICIPAL
MARLIN
MASON COUNTY
MATHIS FIELD
MAY
MCGREGOR MUNICIPAL
MCKINNEY MUNICIPAL
MEXIA-LIMESTONE COUNTY
MID VALLEY
MIDLAND AIRPARK
MIDLAND INTERNATIONAL
MILLER INTERNATIONAL
MINEOLA WISENER FIELD
MINEOLA-QUITMAN
MINERAL WELLS
MONTGOMERY COUNTY
MT. PLEASANT MUNICIPAL
NAVASOTA MUNICIPAL
NEW BRAUNFELS MUNICIPAL
NUECES COUNTY
ODESSA-SCHLEMEYER FIELD
OLNEY MUNICIPAL
ORANGE COUNTY
PALACIOS MUNICIPAL
PALESTINE MUNICIPAL
PANOLA COUNTY-SHARPE FIELD
PARKER COUNTY
PECOS MUNICIPAL
PERRY LEFORS FIELD
PERRYTON OCHILTREE COUNTY
PHIL L. HUDSON MUNICIPAL
PLEASANTON MUNICIPAL
PORT ISABEL-CAMERON COUNTY
POSSUM KINGDOM
REAGAN COUNTY
REDBIRD

RIO GRANDE VALLEY INTERNATIONAL
ROBERT MUELLER MUNICIPAL
ROCKWALL MUNICIPAL
ROY HURD MEMORIAL
RUSK COUNTY
RWJ AIRPARK
SAN ANTONIO INTERNAITONAL
SAN MARCOS MUNICIPAL
SAN PATRICIO COUNTY
SCHOLES FIELD
SHEPPARD AFB/WICHITA FALLS MUNICIPAL
SHERMAN MUNICIPAL
SKYLAKE
SONORA MUNICIPAL
SPEARMAN MUNICIPAL
STEPHENS COUNTY
STINSON MUNICIPAL
STRATFORD FIELD
SULPHUR SPRINGS MUNICIPAL
TAYLOR MUNICIPAL
TERRELL MUNICIPAL
TERRY COUNTY
TOM DANAHER
TRADEWIND
TSTI-WACO
TWIN OAKS
TYLER POUNDS FIELD
VICTORIA REGIONAL
WACO REGIONAL
WEISER AIR PARK
WEST HOUSTON-LAKESIDE
WEST TEXAS
WHARTON MUNICIPAL
WHEELER MUNICIPAL
WICHITA VALLEY
WILBARGER COUNTY
WILLIAM P. HOBBY
WINKLER COUNTY
WINNSBORO MUNICIPAL
WINSTON FIELD
WINTERS MUNICIPAL
YOAKUM MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Texas. The SID's are updated on a 56-day cycle.

ADDISON
ANDRAU AIRPARK
ARLINGTON MUNICIPA
BRAZORIA COUNTY
BROWNSVILLE/SOUTH PADRE ISLAND INTERNATIONAL
CARSWELL AFB
DALLAS NAS (HENSLEY FIELD)
DALLAS-FORT WORTH INTERNATIONAL
DALLAS-LOVE FIELD
DAVID WAYNE HOOKS MEMORIAL
DENTON MUNICIPAL
ELLINGTON FIELD
FORT WORTH MEACHAM
HOUSTON HULL
HOUSTON INTERCONTINENTAL
HOUSTON SOUTHWEST
KILLEEN MUNICIPAL
LA PORTE MUNICIPAL
MIDLAND INTERNATIONAL
MONTGOMERY COUNTY
OAK GROVE
PHIL L. HUDSON MUNICIPAL
REDBIRD
SAN ANTONIO INTERNATIONAL
SCHOLES FIELD
WEST HOUSTON-LAKESIDE
WILLIAM P. HOBBY

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Texas. The STAR's are updated a 56-day cycle.

ADDISON
ANDRAU AIRPARK
ARLINGTON MUNICIPAL
BAYTOWN
BRAZORIA COUNTY
CARSWELL AFB
DALLAS-FORT WORTH INTERNATIONAL
DALLAS-LOVE FIELD
DALLAS-NAS

DAVID WAYNE HOOKS MEMORIAL	OAK GROVE
DENTON MUNICIPAL	PHIL L. HUDSON MUNICIPAL
ELLINGTON FIELD	R.W.J. AIRPARK
FORT WORTH-MEACHAM	RANDOLPH AFB
FORT WORTH-SPINKS	REDBIRD
HOUSTON GULF	SAN ANTONIO INTERNATIONAL
HOUSTON HULL	SCHOLES FIELD
HOUSTON INTERCONTINENTAL	SPINKS
HOUSTON SOUTHWEST	STINSON MUNICIPAL
KELLY AFB	WEISER AIRPARK
LA PORTE MUNICIPAL	WEST HOUSTON-LAKESIDE
MEACHAM	WILLIAM P. HOBBY
MONTGOMERY COUNTY	

2. Current and Future Funding of C&GS Programs in Texas

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Strain Network Station (5)	-	-	10.0	0.3
OC Program	84.0	1.2	168.0	2.4
Aeronautical Charting	2401.3	27.3	2401.3	27.3
Hydrographic Field Party 1	657.4	15.0	690.0	15.0
Hydrographic Field Party 2	-	-	140.0	3.0
NOAA Ship RUDE	-	-	780.0	11.0
Nautical Charting	48.4	0.9	45.1	0.8
EEZ Surveys NOAA Ship MT. MITCHELL and NOAA Ship WHITING	2214.0	41.0	2016.0	25.0
TOTAL	5405.1	85.4	6250.4	84.8

3. Significant Past C&GS Involvement in the State of Texas

Geodesy. Five Calibration Base Lines were established in the State: Amarillo, Fort Worth, Houston, Lampassas, and Midland. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 8,164 kilometers (km) of releveling was accomplished in the State during the period FY 80-86. Horizontal, astronomic, vertical, and gravity surveys were conducted at the McDonald Observatory at Fort Davis to

evaluate the applicability of space geodesy systems to measure motions of the Earth's crust. A horizontal control survey was performed in 1981 at the request of the City of El Paso to update the city's control network. In FY 79, National Geodetic Survey Division (NGSD) participated in the Harris-Galveston Coastal Subsidence District project which required releveling surveys of approximately 3,000 kilometers to monitor land subsidence in the area. NGSD also releveled this area and established 86 Global Positioning System (GPS) points in FY 87. The NGSD also participated in the Texas Gulf Coast Project, a cooperative effort of NOS and the Department of Energy to establish a network of vertical control marks prior to geothermal energy development. NGSD established a Very Long Base Line Interferometry station at Ft. Davis, Texas which is part of a three-station Polar Motion Analysis by Radio Interferometry Survey Network. This network was established in the early 1980's to measure the wobbling motion of the Earth's rotational axis. Information obtained at these stations connects land-based geodetic measurements by providing an absolute coordinate reference in space, and is used to refine satellite orbit predictions and to monitor crustal motion over continental distances. The other two stations are located at Westford, Massachusetts, and Richmond, Florida. Three Global Positioning System (GPS) stations were occupied at the Very Long Base Line Interferometry (VLBI) observatory at Fort Davis in 1983.

In FY 87-88, geodetic control surveys were performed at 151 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program.

In FY 89, geodetic control surveys were performed at 26 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program. One Calibration Base Line (Houston) was established in FY 89.

In FY 89, 359 horizontal and 4,822 vertical control marks were recovered.

In FY 90, a geodetic control survey was performed by GPS in Austin, Dallas, Fort Davis, Houston, and Lubbock as part of the U.S. Eastern Strain Network. Calibration Baselines were verified in Amarillo, Fort Worth, Lampasas, and Midland. Absolute Gravity observation were made in Fort Davis.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 12,109 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2 was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. New editions for 16 nautical charts were published during FY 90, however, a new edition of Coast Pilot 5 was not published. The charts are:

Chart No.	Chart Description
11303 SC	INTRACOASTAL WATERWAY-LAGUNA MADRE-CHUBBY ISLAND TO STOVER POINT
11306 SC	INTRACOASTAL WATERWAY-LAGUNA MADRE-MIDDLE GROUND TO CHUBBY ISLAND
11309	CORPUS CHRISTI BAY
11311	CORPUS CHRISTI HARBOR
11314 SC	INTRACOASTAL WATERWAY-CARLOS BAY TO REDFISH BAY TO COPANA BAY
11315 SC	INTRACOASTAL WATERWAY-ESPIRITU SANTO BAY TO CARLOS BAY
11317	MATAGORDA BAY-LAVACA BAY-TRES PALAICOS BAY
11319 SC	INTRACOASTAL WATERWAY-CEDAR LAKES TO ESPIRITU SANTO BAY
11322 SC	INTRACOASTAL WATERWAY-GALVESTON BAY TO CEDAR LAKES
11323	APPROACHES TO GALVESTON BAY
11324	GALVESTON BAY ENTRANCE
11327	UPPER GALVESTON BAY
11328	HOUSTON SHIP CHANNEL-ATKINSON ISLAND TO ALEXANDER ISLAND
11329	HOUSTON SHIP CHANNEL-ALEXANDER ISLAND TO HOUSTON
11332	SABINE BANK
11341	CALCASIEU PASS TO SABINE PASS

In FY 89, there were nine new editions of nautical charts and a new edition of Coast Pilot 5 published for Texas' near and offshore waters. The charts are:

Chart No.	Chart Description
411	GULF OF MEXICO
11300	GALVESTON TO RIO GRANDE
11302 SC	INTRACOASTAL WATERWAY-LAGUNA MADRE-STOVER POINT TO PORT BROWNSVILLE
11307	ARANSAS PASS TO BAFFIN BAY
11316	MATAGORDA BAY AND APPROACHES
11330	MERMENTAU RIVER TO FREEPORT
11331 SC	INTRACOASTAL WATERWAY-ELLENDER TO GALVESTON BAY
11340	MISSISSIPPI RIVER TO GALVESTON
11342	SABINE PASS AND LAKE

During FY 89, seven shoreline maps were completed for the Corpus Christi Bay to Cuba Island coastal zone. During FY 90, seven maps were completed for the Corpus Christi Bay to Copano Bay area of the Texas coastal zone. Also during FY 90, a photogrammetric survey was completed for the Cuba Island to Mullet Island area resulting in the production of eight shoreline maps.

Atlantic Hydrographic Party 2 began surveys in Corpus Christi and Aransas Bays in FY 90.

During FY 90, the NOAA Ship RUDE conducted wreck and obstruction investigations in the approaches to Sabine.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

481 Alice (OC/ODS)
768 Dallas (OC/ODS)
807 Longview (OC/ODS)
827 Harlingen (OC/ODS)
928 College Station (OC/ODS)
6039 Dallas-Fort Worth (OC/ODS)
6453 Angleton-Lake Jackson (OC/ODS)

4. Planned C&GS Initiatives in the State of Texas During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS's 250 state affiliates of the NOAA/NOS automatic subscriber service in Texas. This also will improve services for ad hoc requestors from the State.

In FY 92, a geodetic control survey is planned to be performed by the Global Positioning System in Austin, Dallas, Fort Davis, Houston, and Lubbock as part of the U.S. Eastern Strain Network.

Nautical Charting. The C&GS is planning to publish 18 new editions of nautical charts and a new edition of Coast Pilot 5 during FY 90. The new chart editions will be:

Number	Scale	Name
11300	460732	GALVESTON TO RIO GRANDE
11302 SC	40000	INTRACOASTAL WATERWAY-LAGUNA MADRE-STOVER POINT TO PORT BROWNSVILLE
11303 SC	40000	INTRACOASTAL WATERWAY-LAGUNA MADRE-CHUBBY ISLAND TO STOVER POINT
11309	40000	CORPUS CHRISTI BAY
11311	10000	CORPUS CHRISTI HARBOR
11314 SC	40000	INTRACOASTAL WATERWAY-CARLOS BAY TO REDFISH BAY TO COPANA BAY
11315 SC	40000	INTRACOASTAL WATERWAY-ESPIRITU SANTO BAY TO CARLOS BAY
11317	50000	MATAGORDA BAY-LAVACA BAY-TRES PALAICOS BAY
11319 SC	40000	INTRACOASTAL WATERWAY-CEDAR LAKES TO ESPIRITU SANTO BAY
11324	25000	GALVESTON BAY ENTRANCE
11326 SC	80000	GALVESTON BAY
11327	25000	UPPER GALVESTON BAY.

11330	250000	MERMENTAU RIVER TO FREEPORT
11332	80000	SABINE BANK
11340	458596	MISSISSIPPI RIVER TO GALVESTON
11341	80000	CALCASIEU PASS TO SABINE PASS
11342	40000	SABINE PASS AND LAKE
11343	40000	SABINE AND NECHES RIVERS

During FY 92, a photogrammetric survey will progress for the Matagorda to West Bay area of the Texas coastal zone with completion planned for FY 93. This survey will result in 8 shoreline maps depicting cartographic features used in nautical chart maintenance and new chart construction, hydrographic survey operations, and coastal management programs.

The NOAA Ship WHITING will continue with side scan sonar surveys in the approaches to Corpus Christi during FY 92. NOAA Ship HECK will begin to follow-up with wreck and obstruction investigations in FY 92.

During FY 92, Atlantic Hydrographic Party 2 will complete surveys in Matagorda and Lavaca Bays.

The NOAA Ships MT. MITCHELL and WHITING will continue multibeam surveys in the Exclusive Economic Zone (EEZ) offshore from Texas during FY 92.

Aeronautical Charting. Eight OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 177 authorized NOS chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Texas

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as

hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

High precision statewide Global Positioning System (GPS) networks meeting high accuracy standards are being established, in response to individual state requests, throughout the United States to support surveying and mapping activities with those states. This Statewide High Accuracy GPS Network covering the State of Texas contains 11 Stations. All stations of this network plus station HARVARD RM 4, at the Very Long Baseline Interferometry (VLBI) site at Fort Davis have been observed simultaneously with stations of the National Crustal Motion Network (NCMN). Recently all stations were occupied during the 1990 observations of the U.S. Eastern Strain Network. This network was established by the Texas State Department of Highways and Public Transportation (TSDHPT), with support from other organizations including the National Geodetic Survey Division (NGSD). Mr. Roger Merrell, TSDHPT, has developed and coordinated the State's effort in establishing the network.

The network was established to support deployment of continuously operating GPS stations known as Regional Reference Points (RRP). Field observations to position the RRP have been performed in conjunction with other concurrent crustal dynamics projects, the first being in 1985 and 1986. Further data reduction and analysis continue as additional observations are made.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for California

1. Name and Status of C&GS Programs for California During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 36,055 horizontal control points and 101,569 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

In FY 91, geodetic control will be established at 17 airports in the State in support of the FAA's ADAM program.

Under a cooperative agreement with the State, NGSD inspects control surveys performed by State personnel and provides field training as needed. Beginning in FY 91, geodetic surveys to establish the Statewide High Accuracy GPS Network covering the State of California containing 230 stations will be performed.

There will be 295 kms of leveling performed in support of the NGRS.

Nautical Charting. There are 20 topographic/bathymetric, 13 bathymetric maps, 3 fishing maps, and 12 multibeam bathymetric maps which provide coverage of California's marine waters. There also are 64 nautical charts which provide coverage of the State's waters. New editions for 29 of these charts will be issued during FY 91. These new editions are:

Number	Scale	Name
18020	1444000	SAN DIEGO TO CAPE MENDOCINO
18622	25000	HUMBOLDT BAY
118626	40000	ELK TO FORT BRAGG
18640	207840	SAN FRANCISCO TO POINT ARENA
18649	40000	SAN FRANCISCO ENTRANCE

18650	20000	SAN FRANCISCO BAY CANDLESTICK POINT TO ANGEL ISLAND
18651	40000	SAN FRANCISCO BAY SOUTHERN PART
18652	80000	SAN FRANCISCO BAY TO ANTIOCH
18654	40000	SAN PABLO BAY
18656	40000	SUISUN BAY
18658	10000	SUISUN BAY-ROE ISLAND AND VICINITY
18659	10000	SUISUN BAY-MALLARD ISLAND TO ANTIOCH
18661	40000	SACRAMENTO AND SAN JOAQUIN RIVERS
18685	50000	MONTEREY BAY
18703	40000	ESTERO BAY
18720	232188	POINT DUME TO PURISIMA POINT
18721	50000	PORT HUENEME TO SANTA BARBARA
18740	234270	SAN DIEGO TO SANTA ROSA ISLAND
18746	80000	SAN PEDRO CHANNEL
18749	20000	SAN PEDRO BAY
18751	12000	LOS ANGELES AND LONG BEACH HARBORS
18754	10000	NEWPORT BAY
18756	20000	SANTA BARBARA ISLAND
18762	40000	SAN CLEMENTE ISLAND
18764	15000	SAN CLEMENTE ISLAND PYRAMID COVE AND APPROACHES
18765	100000	APPROACHES TO SAN DIEGO BAY
18773	12000	SAN DIEGO BAY
18774	100000	GULF OF SANTA CATALINA

Surveys in Sacramento and San Joaquin Rivers were conducted by the Pacific Hydrographic Field Party during FY 91.

There are 123 Nautical Chart Sales Agents in the State of California. These agent are typically retail sporting goods and marine service businesses, bookstores, map dealers, etc.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:112,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to

obstruction clearing and airport facility improvements.

Seventeen OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes five Sectional Charts and four Terminal Area Charts that are updated every 6 months and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 7 Low and High Altitude Enroute Charts and 247 Instrument Approach Charts in one bound volume. Also during FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....77
Standard Terminal Arrival Charts (STAR's).....40
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....60
Category II ILS - special aircrew and aircraft
                certification required.....6
  Category III A ILS - special aircrew and aircraft
                certification required.....2
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Non-Directional Radio Beacon (NDB).....41
  Very High Frequency Omni-Directional Range (VOR).....112
  Area Navigation (RNAV).....5
  Localizer (LOC) and Localizer Backcours (LOCBC).....19
  Localizer Directional Aid (LDA).....5
  Simplified Directional Facility.....0
  Visual Approach Procedures.....7
Airport Diagrams.....35
TOTAL 409

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of California. The IAP's are updated on a 56-day cycle.

ALTURAS MUNICIPAL
ARCATA
BARSTOW-DAGGETT
BERMUDA DUNES
BISWHOP
BLYTHE
BRACKETT FIELD
BRAWLEY MUNICIPAL
BROWN FIELD MUNICIPAL
BUCHANAN FIELD
BURBANK-GLENDALE-PASADENA
CABLE
CAMARILLO
CATALINA
CHICO MUNICIPAL
COLUMBIA
COLUSA COUNTY
COMPTON
CORONA MUNICIPAL
DELANO MUNICIPAL
EL MONTE
FALLBROOK COMMUNITY AIRPARK
FIREBAUGH
FRESNO AIR TERMINAL

FRESNO-CHANDLER DOWNTOWN
FULLERTON MUNICIPAL
GENERAL WILLIAM J. FOX
GILLESPIE FIELD
HAIGH FIELD
HALF MOON BAY
HANFORD MUNICIPAL
HAWTHORNE MUNICIPAL
HAYWARD AIR TERMINAL
HEMET-RYAN
IMPERIAL COUNTY
JACK MCNAMARA FIELD
JOHN WAYNBE AIRPORT-
ORANGE COUNTY
LAKE TAHOE
LAMPSON
LINCOLN MUNICIPAL
LIVERMORE MUNICIPAL
LODI
LOMPOC
LONG BEACH (DAUGHERTY FIELD)
LOS ANGELES INTERNATIONAL
LOS BANOS MUNICIPAL
MADERA MUNICIPAL
MCCLELLAN-PALOMAR
MEADOWS FIELD
MERCED MUNICIPAL-
MACREADY FIELD
METROPOLITAN OAKLAND
INTERNATIONAL
MIRAMAR NAS
MODESTO CITY-COUNTY AIRPORT/
HARRY SHAM FIELD
MOFFETT FIELD NAS
MONTE VISTA MUNICIPAL
MONTEREY PENINSULA
MONTGOMERY FIELD
MURRAY FIELD
NAPA COUNTY
NEEDLES
NEVADA COUNTY AIR PARK
NUT TREE
OAKDALE
OCEANSIDE MUNICIPAL
ONTARIO INTERNATIONAL
OROVILLE MUNICIPAL
OXNARD
PALM SPRINGS REGIONAL
PALMDALE PRODUCTION FLT/TEST
INSTLN AF PLANT NR 42PASO
ROBLES MUNICIPAL
PETALUMA MUNICIPAL
PORTERVILLE MUNICIPAL
RAMONA
RED BLUFF MUNICIPAL
REDDING MUNICIPAL
REID-HILLVIEW OF SANTA CLARA
COUNTY
RIALTO MUNICIPAL-MIRO FIELD
RIO VISTA MUNICIPAL
RIVERSIDE MUNICIPAL
ROHNERVILLE
SACRAMENTO EXECUTIVE
SACRAMENTO METROPOLITAN
SALINAS MUNICIPAL
SAN DIEGO INTERNATIONAL-
LINDBERGH FIELD
SAN FRANCISCO INTERNATIONAL
SAN JOSE INTERNATIONAL
SAN LUIS OBISPO COUNTY-
MC CHESNEY FIELD
SANTA BARBARA MUNICIPAL
SANTA MARIA PUBLIC
SANTA MONICA MUNICIPAL
SANTA YNEZ
SANTA ROSA AIR CENTER
SHAFTER-MINTER FIELD
SISKIYOU COUNTY
SONOMA COUNTY
STOCKTON METROPOLITAN
THERMAL
TORRANCE MUNICIPAL
TRACY MUNICIPAL
TRUCKEE-TAHOE
TWENTYNINE PALMS
UKIAH MUNICIPAL
UNIVERSITY
VAN NUYS
VISALIA MUNICIPAL
WATSONVILLE MUNICIPAL
WATTS-WOODLAND
WHITEMAN
WILLOWS-GLENN COUNTY
YUBA COUNTY

The following is a list of Standard Instrument Departure (SID) charts available for the State of California. The SID's are updated on 56-day cycle.

ARCATA
BUCHANAN FIELD
BURBANK-GLENDALE-PASADENA
FRESNO AIR TERMINAL
JOHN WAYNE AIRPORT-
ORANGE COUNTY
LAKE TAHOE
LOS ANGELES INTERNATIONAL
MEADOWS FIELD
METROPOLITAN OAKLAND
INTERNATIONAL
MONTEREY PENINSULA
NAPA COUNTY
ONTARIO INTERNATIONAL
OXNARD
PALM SPRINGS REGIONAL
REDDING MUNICIPAL
SACRAMENTO METROPOLITAN
SALINAS MUNICIPAL
SAN DIEGO INTERNATIONAL-
LINDBERGH FIELD
SAN FRANCISCO INTERNATIONAL
SAN JOSE INTERNATIONAL
SAN LUIS OBISPO COUNTY-
MC CHESNEY FIELD
SANTA BARBARA MUNICIPAL
SANTA MARIA PUBLIC
SONOMA COUNTY
STOCKTON METROPOLITAN
VAN NUYS

The following is a list of Standard Terminal Arrival (STAR) charts available for the State of California. The STAR's are updated on 56-day cycle.

BRACKETT FIELD
BURBANK-GLENDALE-PASADENA
CHINO
CORONA MUNICIPAL
EL MONTE
FRESNO AIR TERMINAL
FULLERTON MUNICIPAL
JOHN WAYNE-ORANGE COUNTY
LAS ALAMITOS AAF
LONG BEACH (DAUGHERTY FIELD)
LOS ANGELES INTERNATIONAL
MARCH AFB
METROPOLITAN OAKLAND
INTERNATIONAL
NORTH ISLAND NAS
(HALSEY FIELD)
NORTON AFB
ONTARIO INTERNATIONAL
RIALTO MUNICIPAL-MIRO FIELD
RIVERSIDE MUNICIPAL
SACRAMENTO METROPOLITAN
SAN DIEGO INTERNATIONAL-
LINDBERGH FIELD
SAN FRANCISCO INTERNATIONAL
SAN JOSE INTERNATIONAL
TORRANCE MUNICIPAL
TRAVISW AFB
VAN NUYS

2. Current and Future Funding of C&GS Programs in California

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys:				
NGRS Leveling (295 km)	118.0	2.6	-	-
230 GPS Stations	345.0	7.7		
17 FAA Airports	144.5	3.2	-	-
OC Program	357.0	5.1	357.0	5.1
Aeronautical Charting	1761.2	20.0	1761.2	20.0
Pacific Hydrographic Party	189.5	5.0	199.0	5.0

Nautical Charting	346.5	6.0	476.0	7.9
TOTAL	3261.7	49.6	2793.2	38.0

3. Significant Past C&GS Involvement in California

Geodesy. Thirteen Calibration Base Lines were established in the State: Concord, Fremont, Inyokern, Marina, Monterey Bay, Natomas Levee, Ontario, Redding, Riggecrest, Silverado, Sacramento, Ventura, and Yreka. In support of the North American Vertical Datum (NAVD) readjustment project, a total of 3,976 kilometers (km) of releveling was accomplished in California during the period FY 81-89. In FY 84, FY 85, and FY 86, leveling projects to monitor crustal motion were performed in Southern California for the USGS. In FY 86, a leveling project (37km) was performed at the San Francisco International Airport and six Class A marks were set at the Pinon Flat Observatory for the Scripps Institute. The Southern California Releveling Project, which was completed in 1978, involved 18 leveling and five gravity teams from the NGSD, NOS, and the USGS. Several counties and municipalities also assisted in the investigation of crustal motion over the San Andreas and Garlock Faults. The Positron Electron Project, a two-phase effort for the construction of a radial design accelerator near Palo Alto, was completed in 1978. FY 84-86, 60 GPS points were established in California at Black Butte, Mammoth Lake, Deadman Lake, Ocotillo, Pinyon Flat, and Monument Peak in support of the National Crustal Motion Network site development.

In FY 87, 17 GPS reobservations were performed in the Southern California Salton Trough and the Long Valley Caldera, for the USGS to support its continuing crustal motion studies.

During FY 87 and FY 88, geodetic control surveys in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program were conducted at 38 airports.

In FY 89, NGSD performed GPS surveys at Salton Trough and Catalina in support of the National Crustal Motion Network Program. Reimbursable releveling surveys (130 kms) were performed in the Parkfield-Long Valley, CA, area for the U.S. Geological Survey (USGS) in FY 89.

In FY 89, 605 horizontal and 1,861 vertical control points were recovered in the state.

In FY 90, geodetic control surveys were performed throughout California. Twenty-three survey stations were occupied by GPS as part of the Loma Prieta earthquake study. This was in support of a planned survey by the Lamont-Doherty Geological Observatory. Thirty-six survey stations were occupied by GPS in Southern

California to provide crustal motion information. These observations were coordinated with the California Institute of Technology, the Lamont Doherty Geophysical Observatory, and the Massachusetts Institute of Technology as part of the 1990 Salton Trough GPS Campaign.

Three hundred forty-five km of 1st order levels were run in Santa Clara and Santa Cruz counties as part of the Loma Prieta earthquake study. Approximately 240 km of 1st order levels were run in Santa Cruz county to reestablish 1st order vertical control and to determine the extent of damage to the system caused by the Lola Prieta earthquake. Calibration Baselines (CBL's) were established at Redding and Ridgecrest. Existing CBL's were verified at Silverado Trail, Concord, Freemont, Marina, Monterey Bay, Ventura and Ontario. Absolute Gravity measurements were performed at the UCSD Pinyon Flats observatory in Palm Desert and at the NASA Goldstone DSC complex in Barstow.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 17,860 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Twenty-seven new editions of nautical charts and a new edition of Coast Pilot 7 will be published during FY 90. The charts are:

Chart No.	Chart Description
530	SAN DIEGO TO ALEUTIAN ISLANDS AND HAWAIIAN ISLANDS
18007	SAN FRANCISCO TO CAPE FLATTERY
18022	SAN DIEGO TO SAN FRANCISCO BAY
18600	TRINIDAD HEAD TO CAPE BLANCO
18602	PYRAMID POINT TO CAPE SEBASTIAN
18605	TRINIDAD HARBOR
18620	POINT ARENA TO TRINIDAD HEAD
18623	CAPE MENDOCINO AND VICINITY
18628	ALBIAN TO CASPER
18643	BODEGA AND TOMALES BAYS
18645	GULF OF THE FARALONES
18647	DRAKES BAY
18653	SAN FRANCISCO BAY-ANGEL ISLAND TO POINT SAN PEDRO
18661SC	SACRAMENTO AND SAN JOAQUIN RIVERS
18662SC	SACRAMENTO RIVER-ANDRUS TO SACRAMENTO
18680	POINT SUR TO SAN FRANCISCO
18682	HALF MOON BAY
18703	ESTERO BAY
18704	SAN LUIS OBISPO BAY, PORT SAN LUIS

18721	SANTA CRUZ ISLAND TO PURISIMA POINT
18728	SANTA CRUZ CHANNEL
18729	ANACAPA PASSAGE
18744	SANTA MONICA BAY
18749	SAN PEDRO BAY
18751	LOS ANGELES AND LONG BEACH HARBORS
18755	SAN NICOLAS ISLAND
18763	SAN CLEMENTE ISLAND-NORTHERN PART

In FY 90, the Pacific Hydrographic Party completed surveys in Suisun and Honker Bays and begun surveys in Sacramento and San Joaquin Rivers. Another hydrographic survey was also conducted in the vicinity of Huntington Beach during FY 90.

NOAA Ship DISCOVERER conducted multibeam surveys in the Exclusive Economic Zone (EEZ) off the central California coast during FY 90. Six bathymetric maps at 1:100,000 scale compiled from multibeam data were published in FY 90 and included the central California coast in water depths greater than 150 meters. These six maps are Pioneer Canyon, Guide Seamount, Monterey Canyon, Monterey Fan, Shepard Meander, and Davidson Seamount.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

53	Blyth
161	Fresno (Downtown)
236	Long Beach
357	Sacramento (SNS)
552	Van Nuys
643	Modesto
667	Merced
688	Redding
696	Santa Rosa
858	Paso Robles
5136	Fullerton
5218	La Vern
5416	South Lake Tahoe
5490	Sacramento (Metro)
5599	Chino
5730	Santa Ynez
5737	Bishop
5987	Corona

4. Planned C&GS Initiatives in California During FY 92

Geodesy: A marketing plan is being developed in order to improve services to C&GS' 311 state affiliates of the NOAA/NOS automatic subscriber service in California. This also will improve services for ad hoc requestors from the State.

Nautical Charting. Seven shoreline maps are scheduled to be registered in FY 90. The C&GS is planning to publish 27 new editions of existing nautical charts and a new edition of Coast Pilot 7 for FY 92. The new chart editions are:

Number	Scale	Name
501	3500000	WEST COAST OF NORTH AMERICA MEXICAN BORDER TO DIXON ENTRANCE
530	4860700	SAN DIEGO TO ALEUTIAN ISLAND AND HAWAIIAN ISLANDS
18020	1444000	SAN DIEGO TO CAPE MENDOCINO
18022	868003	SAN DIEGO TO SAN FRANCISCO BAY
18620	200000	POINT ARENA TO TRINIDAD HEAD
18645	100000	GULF OF THE FARALLONES
18649	40000	SAN FRANCISCO ENTRANCE
18650	20000	SAN FRANCISCO BAY CANDLESTICK POINT TO ANGEL ISLAND
18651	40000	SAN FRANCISCO BAY SOUTHERN PART
18653	20000	SAN FRANCISCO BAY ANGEL ISLAND TO POINT SAN DIEGO
18654	40000	SAN PABLO BAY
18657	10000	CARQUINEZ STRAIT
18658	10000	SUISUN BAY-ROE ISLAND AND VICINITY
18659	10000	SUISUN BAY-MALLARD ISLAND TO ANTIOCH
18661	40000	SACRAMENTO AND SAN JOAQUIN RIVERS
18662	70000	SACRAMENTO RIVER-ANDRUS ISLAND TO SACRAMENTO
18663	20000	SAN JOAQUIN RIVER-MEDFORD ISLAND TO STOCKTON
18664	20000	SACRAMENTO RIVER-SACRAMENTO TO FOURMILE BEND
18680	210668	POINT SUR TO SAN FRANCISCO
18700	216116	POINT CONCEPTION TO POINT SUR
18720	232188	POINT DUME TO PURISIMA POINT
18744	10000	KING HARBOR
18746	80000	SAN PEDRO CHANNEL
18749	20000	SAN PEDRO BAY
18757	40000	SANTA CATALINA ISLAND
18772	20000	APPROACHES TO SAN DIEGO BAY
18773	12000	SAN DIEGO BAY

In FY 92, the Pacific Hydrographic Field Party will complete surveys in Sacramento and San Joaquin Rivers. They will also begin survey operations in San Francisco Bay anchorages during FY 92.

Aeronautical Charting. Seventeen OC/ODS's and one SNS are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 220 authorized NOS chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of California

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

High precision statewide GPS networks meeting high accuracy standards are being established throughout the United States to support surveying and mapping activities. The Statewide High Accuracy GPS Network covering the State of California contains 230 stations. Spacing between adjacent stations in the network will be approximately 50 kilometers. Of the proposed 230 stations, 160 will be new monuments; 45 existing monuments; and 25 existing crustal motion observation stations including those at the 21 Very Long Baseline Interferometry (VLBI) sites in the state. Reference of the network to the National Crustal Motion Network (NCMN) will be accomplished through the collocated NCMN stations within the network. The network will include selected stations of local high precision GPS networks and crustal monitoring networks established in the state, some of which are in the Loma Prieta Earthquake/San Francisco area, the Imperial Valley and San Diego County areas, and the Mammoth Lakes area. Also stations in local GPS networks which were established by NGSD for monitoring mark stability at VLBI sites at Pinyon Flats, Ocotillio, Deadman, Mammoth Lakes, Black Butte, Monument Peak, Flagstaff, and Yuma will be connected.

This network is being established as a cooperative activity between the California Department of Transportation (CALTRAN) and the National Geodetic Survey Division (NGSD). Mr. Robert Nelson, CALTRAN, is developing and coordinating the State's effort in establishing the network. Field observations have been tentatively scheduled for early 1991 using GPS receivers from a variety of sources.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Oregon

1. Name and Status of C&GS' Programs for Oregon During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 14,321 horizontal control points and 24,405 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning system; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Nautical Charting. There are five topographic/bathymetric, eight bathymetric maps, one fishing map, and eight multibeam bathymetric maps which provide coverage of Oregon's marine waters. There also are 35 nautical charts which provide coverage of the State's waters. New editions for 18 of these charts will be issued during FY 91. The charts are:

Number	Scale	Name
18003	736560	CAPE BLANCO TO CAPE FLATTERY
18010	811980	MONTEREY TO COOS BAY
18520	185238	YAQUINA HEAD TO COLUMBIA RIVER
18521	40000	COLUMBIA RIVER-PACIFIC OCEAN TO HARRINGTON POINT
18523	40000	COLUMBIA RIVER-HARRINGTON POINT TO CRIMS ISLAND
18524	40000	COLUMBIA RIVER-CRIMS ISLAND TO VANCOUVER
18526	20000	PORT OF PORTLAND, INCLUDING VANCOUVER
18528	15000	WILLAMETTE RIVER-PORTLAND TO NEWBERG
18531	40000	COLUMBIA RIVER-VANCOUVER TO THE DALLES
18535	20000	COLUMBIA RIVER-JOHN DAY DAM TO BLALOCK
18536	20000	COLUMBIA RIVER-SUNDALE TO HEPPNER JUNCTION
18539	20000	COLUMBIA RIVER-BLALOCK ISLANDS TO McNARY DAM
18558	20000	TILLAMOOK BAY
18580	191730	CAPE BLANCO TO YAQUINA HEAD

18581	10000	YAQUINA BAY AND RIVER
18583	20000	SIUSLAW RIVER
17587	20000	COOS BAY
18601	40000	CAPE SEBASTIAN TO HUMBUG MOUNTAIN

There are 20 Nautical Chart Sales Agents in the State of Oregon. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements. Aeronautical Charting.

Four OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes two Sectional Charts that are updated every 6 months and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 4 Low and High Altitude Enroute Charts and 77 Instrument Approach Procedure Charts in one bound volume.

Also, during FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....13
Standard Terminal Arrival Charts (STAR's).....3

Precision Instrument Approach Charts:
- Instrument Landing System (ILS).....15
- Category II ILS - special aircrew and aircraft certification required.....1
- Category III A ILS - special aircrew and aircraft certification required.....1
- Microwave Landing System (MLS).....0

Nonprecision Instrument Approach Charts:
- Non-Directional Radio Beacon (NDB).....16
- Very High Frequency Omni-Directional Range (VOR).....35
- Area Navigation (RNAV).....1
- Localizer (LOC) and Localizer Backcourse (LOCBC).....6
- Localizer Directional Aid (LDA).....0
- Simplified Directional Facility.....0

Visual Approach Procedures.....2
Airport Diagrams.....4
TOTAL 97

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Oregon. The IAP's are updated on a 56-day cycle.

AURORA STATE
BAKER MUNICIPAL
BEND MUNICIPAL
BURNS MUNICIPAL
CORVALLIS MUNICIPAL
HERMISTON MUNICIPAL
KLAMATH FALLS INTERNATIONAL
LA GRANDE-UNION COUNTY
LAKE COUNTY
MAHLON SWEET FIELD
MCMINNVILLE MUNICIPAL
MCNARY FIELD
MEDFORD-JACKSON COUNTY
NEWPORT MUNICIPAL
NORTH BEND MUNICIPAL
ONTARIO MUNICIPAL
PEARSON AIRPARK
PENDLETON MUNICIPAL
PORT OF ASTORIA
PORTLAND INTERNATIONAL
PORTLAND INTERNATIONAL JETPORT
PORTLAND-HILLSBORO
PORTLAND-TROUTDALE
ROBERTS FIELD
ROSEBURG MUNICIPAL
SCAPPOOSE INDUSTRIAL AIRPARK
THE DALLES MUNICIPAL
TILLAMOOK

The following is a list of Standard Instrument Departure (SID) charts available for the state of Oregon. The SID's are updated on a 56-day cycle.

KLAMATH FALLS INTERNATIONAL
MAHLON SWEET FIELD
MCNARY FIELD
MEDFORD-JACKSON COUNTY
NORTH BEND MUNICIPAL
PORTLAND INTERNATIONAL JETPORT
PORTLAND-HILLSBORO
PORTLAND-TROUTDALE

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Oregon. The STARs are updated on a 56-day cycle.

PORTLAND INTERNATIONAL JETPORT
PORTLAND-HILLSBORO
PORTLAND-TROUTDALE
PORTLAND INTERNATIONAL

2. Current and Future Funding of C&GS Programs in Oregon

Program Items	FY 91 $K	FY 91 Positions	FY 92 $K	FY 92 Positions
Geodetic Advisor (50/50 cost sharing)	80.0	1 part-time	80.0	1 part-time
OC Program	84.0	1.2	84.0	1.2
Aeronautical Charting	406.2	5.2	406.2	5.2
Nautical Charting	43.6	0.8	25.1	0.4
EEZ Surveys NOAA Ship DAVIDSON	-	-	954.5	17.1
TOTAL	614.0	7.7	1549.8	24.4

3. Significant Past C&GS Involvement in the State of Oregon

Geodesy. Fifteen calibration base lines were established in the State: Albany, Astoria, Bandon, Blue Mountain, Central Oregon, Hermiston, Hillsboro, Klamath Falls, McMinnville, Medford, Newport, Ontario, Portland, Roseburg, and Salem. In support of the North American Vertical Datum (NAVD) readjustment project, a total of 3,653 kilometers (km) of releveling was accomplished in Oregon during the period FY 84-88. A Global Positioning System (GPS) survey was performed in FY 87 for Marin County, Oregon; and NAVAIDS were positioned along the Columbia River for the U.S. Coast Guard (113 stations, approximately one-half of which will be in the State of Washington). Geodetic control surveys in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) Program were performed in FY 87 at two airports: LaGrange and the Dalles. Thirty GPS stations were established for the Oregon Department of Transportation in FY 88.

In FY 89, 203 horizontal and 773 vertical control marks were recovered in the State.

In FY 90, geodetic survey stations were occupied by GPS at 12 dam sites throughout the State per cooperative agreement with

the Department of Interior, Bureau of Reclamation. A Calibration Baseline was established in Roseburg.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 7,414 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Twelve new editions of nautical charts and a new edition of Coast Pilot 7 will be published during FY 90. The new editions are:

Chart No.	Chart Description
530	SAN DIEGO TO ALEUTAIN ISLANDS AND HAWAIIAN ISLANDS
18007	SAN FRANCISCO TO CAPE FLATTERY
18521	PACIFIC OCEAN TO HARRINGTON POINT
18526	PORT OF PORTLAND, INCLUDING VANCOUVER
18531	VANCOUVER TO THE DALLES
18533	LAKE CELILO
18541	McNARY DAM TO JUNIPER
18556	NEHALEM RIVER
18580	CAPE BLANCO TO YAQUINA HEAD
18589	PORT ORFORD TO CAPE BLANCO
18600	TRINIDAD HEAD TO CAPE BLANCO
18602	PYRAMID POINT TO CAPE SEBASTIAN

In FY 90, NOAA Ship SURVEYOR conducted multibeam surveys in the Exclusive Economic Zone (EEZ) off the coast of Oregon. One bathymetric map at 1:100,000 scale compiled from multibeam data was published in FY 90 and included the central Oregon coast in water depths greater than 500 meters. This map is the Heceta Escarpment.

Aeronautical Charting. The following OC/ODS's were published in FY 90:

140 Eugene
330 Portland
782 Corvallis
802 Ontario
929 North Bend

4. Planned C&GS Initiatives for the State of Oregon During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS' 68 state affiliates of the NOAA/NOS automatic subscriber service in Oregon. This also will improve services for ad hoc requestors from the State.

Nautical Charting. The C&GS is planning to publish 10 new editions of nautical charts during FY 92. A new edition of Coast Pilot 7 is published annually. The new chart editions are:

Number	Scale	Name
501	3500000	WEST COAST OF NORTH AMERICA-MEXICAN BORDER TO DIXON ENTRANCE
530	4860700	SAN DIEGO TO ALEUTIAN ISLANDS AND HAWAIIAN ISLANDS
18007	1200000	SAN FRANCISCO TO CAPE FLATTERY
18010	811980	MONTEREY BAY TO COOS BAY
18524	40000	CRIMS ISLAND TO VANCOUVER
18527	5000	WILLAMETTE RIVER-SWAN ISLAND BASIN
18537	20000	COLUMBIA RIVER-ALDERDALE TO BLALOCK ISLANDS
18542	20000	COLUMBIA RIVER-JUNIPER TO PASCO
18583	20000	SIUSLAW RIVER
18588	10000	COQUILLE RIVER ENTRANCE

Aeronautical Charting. Four OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 37 authorized NOS chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Oregon

Geodesy. For 10 years the National Geodetic Survey (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency

Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations. High precision statewide Global Positioning System (GPS) networks meeting high accuracy standards are being established throughout the United States to support surveying and mapping activities. The Statewide High Accuracy GPS Network covering the State of Oregon contains 83 stations. Station spacing on the eastern side of the Cascade Mountain Range is approximately 50 to 100 km and approximately 25 to 50 km on the more developed western side of the Cascade Range. Five stations of the statewide network, NICKOLI RIDGE, BIG FALLS, BIG HILL, H118, and SHORT USGS, and the National Crustal Motion Network (NCMN) station, AVIATION 2, at the Very Long Baseline Interferometry (VLBI) site in Seattle, Washington were observed simultaneously with tracking stations of the Cooperative International GPS Network (CIGNET) during three consecutive observing days. Existing triangulation stations along the western side of the State which are part of ongoing crustal motion studies were incorporated into statewide network where possible. Other existing geodetic control marks were occupied in the statewide network that were determined to be stable and located where desired. Approximately 50 percent of the state network stations in Oregon are existing control station marks.

This network is being established as a cooperative activity between the Oregon Department of Transportation (ODOT) and the National Geodetic Survey Division (NGSD). Cost of the project is shared between the State, several Federal agencies, and local governments. Mr. Lyle Riggers, NGSD geodetic advisor to the State of Oregon, assisted the statewide GPS Users Group in coordinating the State's effort in establishing the network. Field observa- tions began in October 1989. Further data reduction and analysis continue as data are being collected.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Washington

1. Name and Status of C&GS Programs for Washington During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 21,068 horizontal control points and 19,688 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

A geodetic control survey involving 209 GPS stations is planned in cooperation with the State of Washington; 99 stations were positioned in FY 90, with the remaining 110 stations to be positioned in FY 91.

Nautical Charting. There are 9 topographic/bathymetric maps, 12 bathymetric maps and 6 fishing maps which provide coverage of Washington's marine waters. There also are 64 nautical charts which provide coverage of the State's waters. Twenty five new editions of these charts will be issued during FY 91. The new chart editions are:

Number	Scale	Name
18003	736560	CAPE BLANCO TO CAPE FLATTERY
18421	80000	STRAIT OF JUAN DE FUCA TO STRAIT OF GEORGIA
18423	30000	BELLINGHAM TO EVERETT, INCLUDING SAN JUAN ISLANDS
18431	25000	ROSARIO STRAIT TO CHERRY POINT
18433	25000	HARO STRAIT-MIDDLE BANK TO STUART ISLAND
18440	150000	PUGET SOUND
18441	80000	PUGET SOUND-NORTHERN PART
18445	80000	POSSESSION SOUND TO OLYMPIA
18447	10000	LAKE WASHINGTON SHIP CANAL AND LAKE WASHINGTON

18448	80000	PUGET SOUND-SOUTHERN PART
18450	10000	SEATTLE HARBOR, ELLIOT BAY, AND DUWAMISH WATERWAY
18456	20000	OLYMPIA HARBOR AND BUDD INLET
18458	25000	HOOD CANAL-SOUTH POINT TO QUATSAP POINT, INCLUDING DABOB BAY
18465	80000	STRAIT OF JUAN DE FUCA-EASTERN PART
18471	40000	APPROACHES TO ADMIRALTY INLET
18473	40000	OAK BAY TO SHILSHOLE BAY PUGET SOUND
18476	40000	PUGET SOUND-HOOD CANAL AND DABOB BAY
18484	10000	NEAH BAY
18500	180789	COLUMBIA RIVER TO DESTRUCTION ISLAND
18502	40000	GRAYS HARBOR
18504	40000	WILLAPA BAY
18520	185238	YAQUINA HEAD TO COLUMBIA RIVER
18521	40000	COLUMBIA RIVER-PACIFIC OCEAN TO HARRINGTON POINT
18523	40000	COLUMBIA RIVER-HARRINGTON POINT TO CRIMS ISLAND
18524	40000	COLUMBIA RIVER-CRIMS ISLAND TO VANCOUVER
18526	20000	PORT OF PORTLAND, INCLUDING VANCOUVER
18531	40000	COLUMBIA RIVER-VANCOUVER TO THE DALLES
18535	20000	COLUMBIA RIVER-JOHN DAY DAM TO BLALOCK
18539	20000	COLUMBIA RIVER-BLALOCK ISLANDS TO McNARY DAM

Two hydrographic survey vessels and two multibeam survey vessels are presently home ported at the Pacific Marine Center in Seattle. The Pacific Hydrographic Party has made a permanent change of station from Seattle to Rio Vista, California.

The Washington EEZ remains classified because of national defense considerations.

There are 75 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated

runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes one Sectional Chart and one Terminal Area Chart that are updated every 6 months, and one World Aeronautical Chart that is updated annually.

Instrument chart coverage includes 3 Low and High Altitude Enroute Charts and 87 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's)	17
Standard Terminal Arrival Charts (STAR's)	9
Precision Instrument Approach Charts:	
Instrument Landing System (ILS)	18
Category II ILS - special aircrew and aircraft certification required	2
Category III A ILS - special aircrew and aircraft certification required	0
Microwave Landing System (MLS)	0
Nonprecision Instrument Approach Charts:	
Nondirectional Radio Beacon (NDB)	20
Very High Frequency Omni-Directional Range (VOR)	34
Area Navigation (RNAV)	4
Localizer (LOC) and Localizer Backcourse (LOCBC)	5
Localizer Directional Aid (LDA)	1
Simplified Directional Facility	0
Visual Approach Procedures	3
Airport Diagrams	7
TOTAL	120

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Washington. The IAP's are updated on a 56-day cycle.

ARLINGTON MUNICIPAL
BELLINGHAM INTERNATIONAL
BOEING FIELD/KING COUNTY INTERNATIONAL

BOWERMAN
BOWERS FIELD
BREMERTON NATIONAL
EPHRATA MUNICIPAL
FAIRCHILD AFB
FELTS FIELD
FRIDAY HARBOR
GRANT COUNTY
KELSO-LONGVIEW
KENMORE AIR HARBOR SEAPLANE BASE
OAK HARBOR AIR PARK
OLYMPIA
OMAK
PANGBORN MEMORIAL
PEARSON AIRPARK
PORT ANGELES CGAS
PULLMAN-MOSCOW REGIONAL
QUINCY MUNICIPAL
RENTON MUNICIPAL
RICHLAND
SANDERSON FIELD
SEATTLE-TACOMA INTERNATIONAL
SNOHOMISH COUNTY-PAINE FIELD
SPOKANE INTERNATIONAL
TACOMA NARROWS
TRI-CITIES
WALLA WALLA CITY-COUNTY
WILLIAM R. FAIRCHILD INTERNATIONAL
YAKIMA AIR TERMINAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Washington. The SID's are updated on a 56-day cycle.

BOEING FIELD/KING COUNTY INTERNATIONAL
FELTS FIELD
SEATTLE-TACOMA INTERNATIONAL
SNOHOMISH COUNTY-PAINE FIELD
SPOKANE INTERNATIONAL
TRI-CITIES
WALLA WALLA CITY-COUNTY
WILLIAM R. FAIRCHILD INTERNATIONAL
YAKIMA AIR TERMINAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Washington. The STAR's are updated on a 56-day cycle.

BOEING FIELD/KING COUNTY INTERNATIONAL
MC CHORD AFB
SEATTLE-TACOMA INTERNATIONAL

2. Current and Future Funding of C&GS Programs in Washington

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time
Geodetic Surveys: 110 GPS stations	165.0	3.7	-	-
OC Program	42.0	0.6	42.0	0.6
Aeronautical Charting	536.9	6.1	536.9	6.1

Nautical Charting	70.2	1.3	45.0	0.8
TOTAL	894.1	12.2	703.9	8.0

3. Significant Past C&GS Involvement in the State of Washington

Geodesy. Seventeen Calibration Base Lines were established in the State: Arlington, Bayview, Chewelah, Callam County, Dalles, Ellensburg, Kelso, Kitsap, Olympia, Pacific County, Sand Point, Seattle, Spokane, Tri-cities, Vancouver, Wenatchee, and Yakima. In support of the North American Vertical Datum (NAVD) readjustment project, a total of 2,086 kilometers (km) of releveling was accomplished in Washington during the period FY 80-87. During FY 85, Global Positioning System (GPS) surveys were performed in the Mt. St. Helens area (15 stations) for the State's Department of Transportation.

GPS surveys were performed in FY 87-88 for the State Highway Department (51 stations), Boeing Aircraft Company (5 stations), a tide gage for NOS (1 tide gage station) and NAVAIDS were positioned along the Columbia River for the U. S. Coast Guard (247 stations) approximately one-half of which were in the State of Oregon. Geodetic Control Surveys in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) Program were completed in FY 87 at the following six airports: Ellensburg, Omak, Spanaway, Vancouver, Port Angeles, and Shelton.

During FY 88, a GPS survey (41 points) was performed for the Washington Department of Transportation. In FY 89, 339 horizontal and 1,073 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 11,519 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. In FY 90, 32 new editions of nautical charts and a new edition of Coast Pilot 7 will be published for Washington's near and off shore waters. The charts are:

Chart No.	Chart Description
530	SAN DIEGO TO ALEUTIAN ISLANDS AND HAWAIIAN ISLANDS

531	GULF OF ALASKA-STRAIT OF JUAN de FUCA TO KODIAK ISLAND
18007	SAN FRANCISCO TO CAPE FLATTERY
18400	STRAIT OF GEORGIA AND STRAIT OF JUAN de FUCA
18423SC	BELLINGHAM TO EVERETT, INCLUDING SAN JUAN ISLANDS
18428	OAK AND CRESCENT HARBORS
18429	ROSARIO STRAIT-SOUTHERN PART
18430	ROSARIO STRAIT-NORTHERN PART
18440	PUGET SOUND
18441	PUGET SOUND-NORTHERN PART
18443	APPROACHES TO EVERETT
18445SC	PUGET SOUND-POSSESSION SOUND TO OLYMPIA, INCLUDING HOOD CANAL
18446	PUGET SOUND-APPLE COVE POINT TO KEYPORT
18447SC	LAKE WASHINGTON SHIP CANAL
18452	SINCLAIR INLET
18457	PUGET SOUND-HAMMERSLEY INLET TO SHELTON
18465	STRAIT OF JUAN de FUCA-EASTERN PART
18468	PORT ANGELES
18473	PUGET SOUND-OAK BAY TO SHILSHOLE BAY
18477	PUGET SOUND-ENTRANCE TO HOOD CANAL
18480	APPROACHES TO STRAIT OF JUAN de FUCA-DESTRUCTION ISLAND TO AMPHITRITE POINT
18485	CAPE FLATTERY
18521	PACIFIC OCEAN TO HARRINGTON POINT
18526	PORT OF PORTLAND, INCLUDING VANCOUVER
18531	VANCOUVER TO THE DALLES
18533	LAKE CELILO
18541	McNARY DAM TO JUNIPER
18545	LAKE SACAJAWEA
18546SC	SNAKE RIVER-LAKE HERBERT G. WEST
18547PF	SNAKE RIVER-LAKE BRYAN
18551	FRANKLIN D. ROOSEVELT LAKE-SOUTHERN PART
18553	FRANKLIN D. ROOSEVELT LAKE-NORTHERN PART

Aeronautical Charting. The following OC/ODS's were published in FY 90:

45	Bellingham
138	Ephrata
465	Yakama
886	Port Angeles
5186	Tacoma
5396	Renton
5966	Richland
6598	Friday Harbor

4. Planned C&GS Initiatives in Washington During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS's 124 state affiliates of the NOAA/NOS automatic

subscriber service in Washington. This also will improve services for ad hoc requestors from the State.

Nautical Charting. The C&GS is planning to publish 19 new editions of nautical charts and a new edition of Coast Pilot 7 during FY 92. The new chart editions are:

Number	Scale	Name
501	3500000	WEST COAST OF NORTH AMERICA-MEXICAN BORDER TO DIXON ENTRANCE
530	4860700	SAN DIEGO TO ALEUTION ISLANDS AND HAWAIIAN ISLANDS
18421	80000	STRAIT OF JUAN DE FUCA TO STRAIT OF GEORGIA
18423	30000	BELLINGHAM TO EVERETT INCLUDING SAN JUAN ISLANDS DRAYTON HARBOR
18432	25000	BOUNDARY PASS
18434	25000	SAN JUAN CHANNEL
18440	150000	ADMIRALTY INLET AND PUGET SOUND
18441	80000	ADMIRALTY INLET AND PUGET SOUND TO SEATTLE
18444	10000	EVERETT HARBOR
18445	80000	POSSESSION SOUND TO VASHON ISLAND
18448	25000	PUGET SOUND SEATTLE TO BREMERTON
18453	15000	TACOMA HARBOR
18465	80000	STRAIT OF JUAN DE FUCA EASTERN PART
18471	40000	APPROACHES TO ADMIRALTY INLET
18477	25000	PUGET SOUND
18480	176253	APPROACHES TO STRAIT OF JUAN DE FUCA - DESTRUCTION ISLAND TO AMPHITRITE
18537	20000	COLUMBIA RIVER ALDERDALE TO BLALOCK ISLANDS
18542	20000	COLUMBIA RIVER JUNIPER TO PASCO

Aeronautical Charting. Two OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 58 authorized NOS chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Washington

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen

the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

High precision statewide Global Positioning System (GPS) networks meeting high accuracy standards are being established throughout the United States to support surveying and mapping activities. The Statewide High Accuracy GPS Network covering the State of Washington contains 209 stations. Station spacing is approximately 10 kilometers in the highly developed Seattle-Tacoma area and approximately 15 to 35 kilometers in the remainder of the state. Seven stations of the network, of which four are in the state and three are in nearby areas adjacent to Washington, will be observed simultaneously with tracking stations of the Cooperative International GPS Network (CIGNET) during three consecutive observing days. The seven stations are: stations JUSTICE, SAT TRACK STA 003, AVIATION 2, NW VLBA in Washington; two strain stations, NICKOLI RIDGE and BIG HILL, in the high precision geodetic network in the State of Oregon; and station 887006 at the Very Long Baseline Interferometry (VLBI) site at Penticton, British Columbia. Two of the stations in the Washington network are also part of the National Crustal Motion Network (NCMN): station AVIATION 2 is at the VLBI site near Seattle, Washington, and station NW VLBA is at the Very Long Baseline Array site near Bridgeport, Washington. Several existing geodetic stations which are part of the local Juan de Fuca strain network and sea-level monitoring network are incorporated in the Washington network. In addition, connections are planned to seven GPS stations in the high precision network in Oregon and to seven existing GPS stations across the Washington border with Canada, one of the stations being near the proposed VLBI site at Victoria, Vancouver Island. Existing geodetic control marks will be occupied in the statewide network that have been determined to be stable and located where desired. Approximately 50 percent of the network stations in Washington will be existing control station marks. Leveling is planned over approximately 75 percent of the 209 stations in the network.

This network is being established as a cooperative activity between the Washington Department of Natural Resources and the National Geodetic Survey (NGS). Cost of the project is shared between the State, several Federal agencies, and local governments which form a GPS Users Group. Mr. Dennis Wegenast,

NGSD geodetic advisor to the State of Washington, assisted the statewide GPS Users Group in developing and coordinating the State's effort in establishing the network. Field observations begin in 1990 and will continue into 1991.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Alaska

1. Name and Status of C&GS' Programs for Alaska During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 47,265 horizontal control points and 3,826 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident NOS advisor is responsible for the planning and execution of the following programs: assisting the state in tidal observations, coastal mapping, and geodetic control surveys.

In FY 91, NGSD will provide technical assistance to the Alaska Department of Transportation and Public Facilities with its GPS surveys along the State's Federal Highway System.

Nautical Charting. There are 245 nautical charts, 151 topographic/bathymetric and bathymetric maps, 4 multibeam bathymetric maps, and 2 Coast Pilot publications which provide coverage of Alaska's marine waters. During FY 91, 57 new editions of these charts will be issued. They are:

Number	Scale	Name
16004	700000	POINT BARROW TO HERSCHEL ISLAND
16005	700000	BERING SEA-EASTERN PART
16042	51024	GRIFFIN POINT AND APPROACHES
16046	50204	MCCLURE AND STOCKTON ISLANDS AND VICINITY
16081	48149	SCOTT POINT TO TANGENT POINT
16084	50000	PEARD BAY AND APPROACHES
16088	50000	UTUKOK PASS TO BLOSSOM SHOALS
16101	50000	POINT LAY AND APPROACHES
16102	50000	KOOCHEOK RIVER TO KUKPOWRUK PASS
16103	50000	CAPE BEAUFORT
16104	50000	CAPE SABINE

16121	50000	EAST OF CAPE LISBURNE
16122	50000	CAPE OYER TO CAPE LISBURNE
16123	50000	POINT HOPE TO CAPE DYER
16305	100000	BRISTOL BAY - CAPE NEWENHAM AND HAGEMEISTER STRAIT
16315	100000	BRISTOL BAY - TOGIAK BAY AND WALRUS ISLANDS
16381	50000	ST GEORGE ISLAND
16382	50000	ST PAUL ISLAND
16431	20000	TEMNAC BAY
16432	25000	MASSACRE BAY
16434	40000	ATTU ISLAND
16440	300000	RAT ISLANDS
16441	80000	RAT ISLANDS - KISKA ISLAND AND APPROACHES
16446	10000	CONSTANTINE HARBOR
16462	50000	TANAGA BAY AND APPROACHES
16463	50000	KANAGA PASS AND APPROACHES
16474	12000	BAY OF ISLANDS
16480	300000	AMUKTA ISLAND TO IGITKIN ISLAND
16500	300000	UNALASKA ISLAND TO AMUKTA ISLAND
16515	40000	UNALASKA ISLAND-CHERNOFSKI HARBOR TO SKAN BAY
16521	40000	UNALASKA ISLAND-PROTECTION BAY TO EAGLE BAY
16529	10000	DUTCH HARBOR
16531	80000	KRENITZIN ISLANDS
16532	20000	AKUTAN BAY
16551	80000	UNGA ISLAND TO PAVLOF BAY
16568	106600	WIDE BAY TO CAPE KUMLIK
16576	80000	SHELIKOF STRAIT - CAPE NUKSHAK TO DAKAVAK BAY
16592	80726	GULL POINT TO KAGUYAK BAY
16604	78000	SHUYAK AND AFOGNAK ISLANDS AND ADJACENT WATERS
16606	77062	BARREN ISLANDS
16662	100000	COOK INLET KALGIN ISLAND TO NORTH FORELAND
16683	81436	POINT ELRINGTON TO CAPE RESURRECTION
16707	40000	PRINCE WILLIAM SOUND
16708	79291	PRINCE WILLIAM SOUND PORT FIDALGO AND VALDEZ ARM
16741	40000	ICY BAY
16760	300000	CROSS SOUND TO YAKUTAT BAY
17314	20000	SLOCUM AND LIMESTONE INLETS AND TAKU HARBOR
17317	80000	LYNN CANAL-POINT SHERMAN TO SKAGWAY
17318	80000	GLACIER BAY
17320	217828	CORONATION ISLAND TO LISIANSKI STRAIT
17325	40000	SOUTH AND WEST COASTS OF KRUZOF ISLAND
17339	30000	HOOD BAY AND KOOTZNAHOO INLET
17360	217828	ETOLIN ISLAND TO MIDWAY ISLAND
17363	40000	PYBUS BAY-FREDERICK SOUND
17365	20000	WOEWODSKI AND ELIZA HARBORS
17368	40000	KEKU STRAIT NORTHERN PART
17376	40000	TEBENKOF BAY

There are 42 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine

service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

During FY 91, the NOAA ship RAINIER completed surveys in Icy Strait and began surveying in Cross Sound. Survey operations will also continue in Togiak Bay in FY 91. The NOAA Ship DAVIDSON will be reactivated in FY 91, and will survey in Rudyerd Bay and Northern Cook Inlet.

In FY 91, NOAA Ships SURVEYOR and DISCOVERER will resume multibeam surveys in the Exclusive Economic Zone (EEZ) in the Gulf of Alaska.

Shoreline mapping is scheduled for a portion of Lynn Canal, Stephens Passage, and Shelikof Strait in FY 91. Twenty-five maps are targeted for production. These maps will be produced using photogrammetric techniques and instruments and will provide the graphic representation of selected features measured from aerial photographs. Feature delineation will include the shoreline, alongshore coastal features, and a narrow zone of natural and man-made features inland from the shore. Shoreline maps are primarily used to support nautical chart maintenance and new chart construction, hydrographic survey operations, and coastal management programs.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

No OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in Alaska.

Visual chart coverage includes 16 Sectional Charts and one Terminal Area Chart that are updated every 6-12 months, and eight World Aeronautical Charts that are updated annually. Instrument chart coverage includes 6 Low and High Enroute Charts and 241 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....23
Standard Terminal Arrival Charts (STAR's).....4
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....33
  Category II ILS - special aircrew and aircraft
                  certification required.....2
  Category III A ILS - special aircrew and aircraft
                  certification required.....0
  Microwave Landing System.....1
Nonprecision Instrument Approach Charts:
  Non-Directional Radio Beacon (NDB).....82
  Very High Frequency Omni-Directional Range (VOR).....85
  Area Navigation (RNAV).....2
  Localizer (LOC) and Backcourse (LOCBC).....16
  Localizer Directional Aid (LDA).....6
  Simplified Directional Facility.....0
Visual Approach Procedures.....1
Airport Diagrams.....13
TOTAL. 266

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Alaska. The IAP's are updated on a 56-day cycle.

ALLEN AAF
AMBLER
ANCHORAGE INTERNATIONAL
ANIAK
BETHEL
BETTLES
BIG LAKE
COLD BAY
DEADHORSE
DILLINGHAM
ELMENDORF AFB
EMMONAK
FAIRBANKS INTERNATIONAL
FORT YUKON
GALENA
GAMBELL
GARY MUNICIPAL
GULKANA
HOMER
HOOPER BAY
ILIAMNA
JUNEAU INTERNATIONAL
KENAI MUNICIPAL
KETCHIKAN INTERNATIONAL
KING SALMON
KIPNUK
KODIAK
MCGRATH
MEKORYUK
MERLE K (MUDHOLE) SMITH
MERRILL FIELD
MIDDLETON ISLAND
MINCHUMINA
NENANA MINICIPAL
NEW SHISHMAREF
NOME

GUSTAVUS
NORTHWAY
PETERSBURG
POINT HOPE
PORT HEIDEN
RALPH M. CALHOUN MEMORIAL
RALPH WIEN MEMORIAL
SAND POINT
SAVOONGA
SELAWIK
SITKA
SOLDOTNA
ST. MARY'S
NOME CITY
ST. PAUL ISLAND
TALKEETNA
TOGIAK
UMIAT
UNALAKLEET
UNALASKA
VALDEZ
WAINWRIGHT AAF
WILEY POST-WILL ROGERS MEMORIAL
WRANGELL
YAKUTAT

The following is a list of Standard Instrument Departure (SID) charts available for the State of Alaska. The SID's are updated on a 56-day cycle.

ANCHORAGE INTERNATIONAL
BETHEL
FAIRBANKS INTERNATIONAL
HOMER
JUNEAU INTERNATIONAL
KETCHIKAN INTERNATIONAL
KODIAK
MERLE K (MUDHOLE) SMITH
SITKA
VALDEZ
YAKUTAT

The following is a list of Standard Terminal Arrival (STAR) charts available for the State of Alaska. The STAR's are updated on a 56-day cycle.

ANCHORAGE INTERNATIONAL
ELMENDORF AFB
MERRILL FIELD

2. Current and Future Funding of C&GS Programs in Alaska

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys, technical assistance	45.0	1.0	45.0	1.0
NOS Advisor (50/50 Cost Sharing)	90.0	1 part time	90.0	1 part time
EEZ Surveys				
NOAA Ship SURVEYOR	1239.0	14.0	-	-
NOAA Ship DISCOVERER	1357.2	16.8	1357.2	16.8
Aeronautical Charting	1265.6	14.4	1265.6	14.4
OC Program	0.0	0.0	168.0	2.4

Nautical Charting	138.0	2.5	97.7	1.7
TOTAL	4134.8	49.2	3023.5	36.8

3. Significant Past C&GS Involvement in the State of Alaska

Geodesy. Five Calibration Base Lines have been established in the State: Anchorage, Juneau, F. W. Williamson, Campbell Airstrip, and Fairbanks.

During FY 87, ten GPS stations were established on the North Slope and eight GPS stations were established in Eagle River; and five stations were established at National Crustal Motion Network Sites in support of NGSD's Crustal Motion Studies Program.

Basic horizontal and vertical geodetic control have been established throughout the State, and numerous projects have been completed to meet local geodetic control requirements. Extensive horizontal and vertical control surveys were conducted around Prince William Sound immediately after the 1964 earthquake.

Doppler satellite surveys, in cooperation with the Bureau of Land Management, have been conducted in support of the Alaska Native Claims Settlement Act.

Global Positioning System (GPS) surveys were performed in the vicinities of Matanuska-Susitna Borough (23 points), Anchorage (6 points), North Slope (13 points), Plover Island-Prince William Sound (13 points), Adak (11 points), and at six Very Long Base Line Interferometry sites: Cape Yakataga, Sourdough, Fairbanks, Nome, Kodiak, and Sand Point in FY 85 and FY 86.

In FY 88, NGSD entered into a 4-year cooperative reimbursable agreement to provide assistance to the Alaska Department of Transportation and Public Facilities (AKDOT&PF) with planning, reconnaissance, field operations, and adjustment procedures for GPS surveys along the State's Federal Highway System. During 1988, NGSD established 18 GPS points in support of this project and 20 GPS points in the Bristol Bay area. In FY 89, 39 horizontal and 78 vertical control points were recovered in the state.

In FY 90, two geodetic control surveys were performed by GPS: twenty stations were positioned in the North Slope area in support of the Boundary Working Group (BWG) mapping project; and twenty-seven stations were positioned to provide a primary high precision geodetic network in support of a cooperative agreement between C&GS and the Alaska Department of Transportation and Public Facilities. Absolute Gravity measurements were performed

at the USGS college observatory in Fairbanks and the Palmer Tsunami Warning Center in Anchorage.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 23,525 horizontal control stations within the State were evaluated, adjusted and published as part of the horizontal control network of the NGRS, and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Ninety new editions of nautical charts will be printed during FY 90. They are:

Chart No.	Chart Description
500	WEST COAST OF NORTH AMERICA DIXON ENTRANCE TO UNIMAK PASS
513	BERING SEA SOUTHERN PART
530	SAN DIEGO TO ALEUTION ISLANDS AND HAWAIIAN ISLANDS
531	GULF OF ALASKA - STRAIT OF JUAN DE FUCA TO KODIAK ISLAND
16005	CAPE PRINCE OF WALES TO POINT BARROW
16011	ALASKA PENINSULA AND ALEUTIAN ISLANDS TO SEGUAM PASS
16012	AMUKTA ISLAND TO ATTU ISLAND
16013	CAPE ST. ELIAS TO SHUMAGIN ISLANDS
16083	SKULL CLIFF AND VICINITY
16085	WAINWRIGHT INLET TO ATANIK
16086	NOKOTLEK POINT TO WAINWRIGHT INLET
16087	ICY CAPE TO NOKOTLEK POINT
16206	NORTON SOUND-NOME HARBOR AND APPROACHES
16240	ST. MICHAEL BAY
16300	GOODNEWS BAY
16305	BRISTOL BAY - CAPE NEWENHAM AND HAGE MEISTER STRAIT
16315	BRISTOL BAY - TOGIAK BAY AND WALRUS ISLANDS
16380	PRIBILOF ISLANDS
16420	NEAR ISLANDS BULDIR ISLAND TO ATTU ISLAND
16431	TEMNAC BAY
16433	SARANA BAY TO HOLTZ BAY
16460	IGITKIN ISLAND TO SEMISOPOCHNOI ISLAND
16471	KANAGA ISLAND KANAGA BAY
16475	KULUK BAY AND APPROACHES
16476	ADAK ISLAND-SWEEPTER COVE FINGER AND SCABBARD BAYS
16484	ATAKA ISLAND TO CHUGUL ISLAND
16514	UNALASKA ISLAND-KULILIAK BAY TO SURVEYOR BAY
16516	CHERNOFSKI HARBOR
16518	CAPE KOVRIZHKA TO CAPE CHEERFUL
16530	CAPTAINS BAY
16535	MORZHOVOI BAY AND ISANOTSKI STRAIT
16549	ALASKA PENINSULA COLD BAY AND APPROACHES
16553	SHUMAGIN ISLANDS NAGAI ISLAND TO UNGA ISLAND

16556	CHIACHI ISLAND TO NAGAI ISLAND
16566	CHIGNIK AND KUJULIK BAYS
16568	WIDE BAY TO CAPE KUMLIK
16580	KODIAK ISLAND
16593	CHINIAK BAY TO DANGEROUS CAPE
16597	UGANIK AND UYAK BAYS
16598	CAPE IKOLIK TO CAPE KULIUK
16599	BAYS AND ANCHORAGE LARSEN BAY
16605	SHUYAK STRAIT AND BLUEFOX BAY
16640	NINILCHIK HARBOR
16645	GORE POINT TO ANCHOR POINT
16648	KAMISHAK BAY COOK INLET
16660	KENAI RIVER
16661	COOK INLET - ANCHOR POINT TO KALGIN ISLAND
16663	COOK INLET - EAST FORELAND TO ANCHORAGE
16665	APPROACHES TO ANCHORAGE
16681	SEAL ROCKS TO GORE POINT
16682	CAPE RESURRECTION TO TWO ARM BAY
16701	PRINCE WILLIAM SOUND WESTERN ENTRANCE
16702	LATOUCHE PASSAGE TO WHALE BAY
16704	DRIER BAY
16705	PRINCE WILLIAM SOUND WESTERN PART
16706	PASSAGE CANAL INCLUDING PORT OF WHITTIER
16723	CONTROLLER BAY
16761	YAKUTAT BAY
16762	LITUYA BAY
17303	YAKOBI ISLAND AND LISIANSKI INLET
17313	PORT SNETTIHAM
17321	CAPE EDWARD TO LISIANSKI STRAIT
17328	BARANOF ISLAND SNIPE BAY TO CRAWFISH INLET
17330	CAPE OMMANEY TO BYRON BAY
17333	PORTS HERBERT, WALTER, LUCY, AND ARMSTRONG
17338	PERIL STRAIT HOONAH SOUND TO CHATHAM STRAIT
17360	BIG CASTLE ISLAND
17362	GAMBIER BAY
17367	THOMAS, FARRAGUT AND PORTAGE BAYS
17372	KEKU STRAIT MONTE CARLO ISLAND TO ENTRANCE ISLAND
17375	WRANGELL NARROWS
17378	PRINCE OF WALES ISLAND - PORT PROTECTION
17384	WRANGELL HARBOR AND APPROACHES
17385	ERNEST SOUND-EASTERN PASSAGE AND ZIMOVIA STRAIT
17400	DIXON ENTRANCE TO CHATHAM STRIGHT
17401	LAKE BAY AND APPROACHES CLARENCE STRAIT
17402	SOUTHERN ENTRANCES TO SUMNER STRAIT
17403	DAVIDSON INLET AND SEA OTTER SOUND
17405	ULLOA CHANNEL TO SAN CHRISTOLVAL CHANNEL
17406	BAKER NOYES, AND LULU ISLANDS AND ADJACENT WATERS
17408	CENTRAL DALL ISLAND AND VICINITY
17420	HECATE STRAIT TO ETOLIN ISLAND
17422	WESTERN PART OF BEHM CANAL
17423	RATZ HARBOR PRINCE OF WALES ISLAND
17425	PORTLAND CANAL NORTH OF HATTIE ISLAND

17430	KETCHIKAN HARBOR
17431	NORTH END OF CORDOVA BAY AND HETTA INLET
17433	PRINCE OF WALES ISLAND-KENORICK BAY TO SHIPWRECK POINT
17434	REVILLAGIGEDO CHANNEL
17437	PORTLAND INLET TO NAKAT BAY

One new chart, Chart 16575 - Dakavak Bay to Cape Unalishagvak, was printed during FY 89. A new edition of Coast Pilot 8 and 18 bathymetric maps were published in FY 88.

A new edition of Coast Pilot 9, ten bathymetric maps, and two topographic/bathymetric maps were published in FY 87.

In FY 90, the NOAA Ship RAINIER conducted hydrographic surveys in Icy Strait and Togiak Bay. Special surveys of Pelican Harbor and Sitka Harbor were also conducted in FY 90.

Fourteen new shoreline maps were registered during FY 90. Areas covered included Dutch Harbor, North Slope, and Cross Sound.

Aeronautical Charting. No OC/ODS's were published in FY 90.

4. Planned C&GS Initiatives in the State of Alaska During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 50 state affiliates of NOAA/NGSD automatic subscriber service in Alaska. This will also improve services for ad hoc requestors from the state.

In FY 92, NGSD will continue to provide technical assistance to the Alaska Department of Transportation and Public Facilities with its Global Positioning System surveys along the State's Federal Highway System.

Nautical Charting. Seventeen shoreline maps are scheduled to be registered in FY 92. The C&GS is planning to publish a total of 39 new editions of nautical charts, seven bathymetric maps, and one topographic/bathymetric map in FY 92. A new edition of Coast Pilot 8 will be published in FY 92. The new nautical chart editions are:

Number	Scale	Name
501	3500000	NORTH AMERICA, MEXICAN BORDER TO DIXON ENTRANCE
530	4860700	SAN DIEGO TO ALEUTION ISLANDS AND HAWAIIAN ISLANDS
531	2100000	GULF OF ALASKA - STRAIT OF JUAN DE FUCA TO KODIAK ISLAND
6006	1534076	BERING SEA - EASTERN PART
16013	969761	CAPE ST. ELIAS TO SHUMAGIN ISLANDS

16016	969756	DIXON ENTRANCE TO CAPE ST. ELIAS
16124	50000	CAPE THOMPSON TO POINT HOPE
16322	100000	BRISTOL BAY - NUSHAGAK BAY AND APPROACHES
16323	100000	BRISTOL BAY - KVICHAK BAY AND APPROACHES
16338	100000	BRISTOL BAY - UGASHI BAY TO EGEGIK BAY
16436	20000	SHEMYA ISLAND
16477	30000	TAGALAK ISLAND TO LITTLE TANAGA ISLAND
16478	30000	TAGALAK ISLAND TO GREAT SITIN ISLAND
16487	40000	KOROVIN BAY TO WALL BAY
16490	20000	NAZAN BAY AND AMLIA PASS
16511	40000	INANUDAK BAY AND NIKOISKI BAY
16517	40000	MAKUSHIN BAY
16522	40000	BEAVER INLET
16528	40000	UNALASKA BAY AND AKUTAN PASS
16547	81326	SANAK ISLAND AND SANDMAN REEFS
16568	106600	WIDE BAY TO CAPE KUMLIK
16591	20000	PART OF ALITAK BAY, CAPE ALITAK TO MOSER BAY
16603	30000	KUKAK BAY
16608	80000	CAPE DOUGLAS TO CAPE NUKSHAK
16640	200000	COOK INLET - SOUTHERN PART
16660	194154	COOK INLET - NORTHERN PART
16700	200000	PRINCE WILLIAM SOUND
16710	30000	ORCA BAY AND INLET - CHANNEL ISLANDS TO CORDOVA
17300	209978	STEPHENS PASSAGE TO CROSS SOUND INCLUDING LYNN CANAL
17301	40000	CAPE SPENCER TO ICY POINT
17315	40000	GASTINEAU CHANNEL AND TAKU INLET
17318	80000	GLACIER BAY
17327	10000	SITKA HARBOR AND APPROACHES
17331	10000	PORTS ALEXANDER, CONCLUSION, AND ARMSTRONG
17335	20000	PATTERSON BAY AND DEEP COVE
17360	217828	ETOLIN ISLAND TO MIDWAY ISLANDS INCLUDING SUMNER STRAIT
17426	40000	KASAAN BAY - PRINCE OF WALES ISLAND
17427	80000	PORTLAND CANAL - DIXON ENTRANCE TO HATTIE ISLAND
17432	40000	CLARENCE STRAIT AND MOIRA SOUND

In FY 92, the NOAA ship RAINIER will resume surveys along the southern Alaska peninsula and continue surveying in Cross Sound. RAINIER will also begin survey operations in southern Stephens Passage and adjoining bays in FY 92. The NOAA Ship DAVIDSON will continue surveying in Rudyerd Bay and begin surveys from Kootznahoo Inlet to Whitewater Bay during FY 92. DAVIDSON will also begin surveying in Dutch Harbor, Unalaska Bay in FY 92.

The NOAA Ship DISCOVERER will continue multibeam surveys in the Exclusive Economic Zone (EEZ) in the Gulf of Alaska in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers,

and to the 42 authorized NOS chart agents in the State can be improved during FY 92.

Aeronautical Charting. Eight OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of Alaska

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

High precision statewide Global Positioning System (GPS) networks meeting high accuracy standards are being established throughout the United States to support surveying and mapping activities. The Statewide High Accuracy GPS Network covering the State of Alaska contains 50 Stations. Spacing between adjacent stations in the network varies as to the needs of the state; in the Anchorage and other developed areas of the state, spacing will be no greater than 50 kilometers. The statewide high precision network observations began in 1988, additional observations were made in 1989, and July-August 1990. Monitoring the VLBI sites for site stability and relative motion has been performed by the National Geodetic Survey Division (NGSD) using GPS since 1984. The network includes stations at the six National Crustal Motion Network (NCMN) stations located at the Very Long Baseline Interferometry (VLBI) sites at Nome, Sandpoint, Kodiak, Cape Yakataga, Sourdough, and Fairbanks. The basic 50 station statewide network will connect to existing GPS networks established by the NGSD along the southeast shore of Bristol Bay, along the Arctic Ocean shore extending across northern Alaska, along the north shore of Prince William Sound, and several networks in Anchorage and surrounding area. Because of logistical considerations, many of the vectors in these projects

were observed for 4 to 6 hours, and they may be reducible with crustal motion monitoring accuracy.

This network is being established as a cooperative activity between the Alaska Department of Transportation and Public Safety (ADOTPS) and NGSD. Mr. Randall Devore (ADOTPS) and Mr. Don D'Onofrio, NGSD geodetic advisor to the State of Alaska, are developing and coordinating the State's effort in establishing the network. Field observations were performed in 1988, 1989, and 1990 by NGSD. Further data reduction and analysis continue as additional observations are made.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronuatical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Hawaii

1. Name and Status of C&GS Programs for Hawaii During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD approximately 4,076 horizontal control points and 1,678 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Nautical Charting. There are 40 nautical charts, 3 bathymetric maps, and 6 multibeam bathymetric maps which provide coverage of the State's waters. During FY 91, 11 new editions of these charts will be issued. They are:

Number	Scale	Name
1900	600000	HAWAIIAN ISLANDS
19010	675000	HAWAIIAN ISLANDS-SOUTHERN PART
19322	2500	HARBORS AND LANDINGS ON THE NORTHEAST AND SOUTHEAST COASTS
19347	80000	CHANNELS BETWEEN MOLOKAI, MAUI, LANAI AND KAHOOLAWE
19350	10000	ISLAND OF MAUI MAALAEA BAY
19361	10000	PORT WAIANAE, ISLAND OF OAHU
19367	5000	HONOLULU HARBOR
19380	247482	OAHU TO NIIHAU
19384	2500	HANAMAULU BAY ISLAND OF KAUAI
19441	80000	MARO REEF
19481	32500	MIDWAY ISLANDS

Shoreline maps are the graphic representation of planetable and photogrammetric surveys which currently comprise the "T" and "TP" series maps of NOS. The maps contain graphic data relating to the shoreline, alongshore natural and man-made features, and a narrow zone of natural and man-made features inland from the shoreline. The original sources of a shoreline map are ground survey data and photographs. Utilizing these sources,

photogrammetric map compilation techniques, and instruments, cartographers generate shoreline maps, overlays, and associated data. The data are primarily generated to support nautical chart maintenance, new nautical chart construction, and hydrographic survey operations. Eight shoreline maps are scheduled to be registered in FY 89.

There are 12 Nautical Chart Sales Agents in the State of Hawaii. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

No OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes one Sectional Chart that is updated every 6 months. Instrument chart coverage includes 31 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....14
Standard Terminal Arrival Charts (STAR's).....8
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....6

Category II ILS - special aircrew and aircraft certification required.....0
Category III A ILS - special aircrew and aircraft certification required.....0
Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
Non-Directional Radio Beacon (NDB).....3
Very High Frequency Omni-Directional Range (VOR).....18
Area Navigation (RNAV).....0
Localizer (LOC) and Localizer Backcourse (LOCBC).....3
Localizer Directional Aid (LDA).....1
Simplified Directional Facility.....0
Visual Approach Procedures.....0
Airport Diagrams.....2
TOTAL 55

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Hawaii. The IAP's are updated on a 56-day cycle.

AGANA NAS (BREWER FIELD)	KEAHOLE
BRADSHAW AAF	LANAI
HILO INTERNATIONAL	LIHUE
HONOLULU INTERNATIONAL	MOLOKA
KAHULUI	WAIMEA-KOHALA

The following is a list of Standard Instrument Departure (SID) charts available for the State of Hawaii. The SID's are updated on a 56-day cycle.

HILO INTERNATIONAL	KEAHOLE
HONOLULU INTERNATIONAL	LIHUE
KAHULUI	MOLOKAI

The following is a list of Standard Instrument Departure (SID) charts available for the State of Hawaii. The SIDs are updated on 56-day cycle.

HONOLULU INTERNATIONAL	KEAHOLE
KAHULUI	

2. Current and Future Funding of C&GS Programs in Hawaii

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Aeronautical Charting	265.5	3.0	265.5	3.0
OC Program	-	-	-	-

Nautical Charting	26.6	0.5	30.1	0.5
EEZ Surveys NOAA Ship SURVEYOR	-	-	1239.0	14.0
TOTAL	292.1	3.5	1534.6	17.5

3. Significant Past C&GS Involvement in Hawaii

Geodesy. Five Calibration Base Lines were established in the State: Hilo, Iroquois Point, Kahului, Kona, and Mana.

In 1979, vertical control surveys were conducted on Maui Island to support the University of Hawaii's lunar ranging experiment. These surveys also serve as a base for crustal motion studies of the Island. In FY 87, eight GPS stations were established on the islands of Maui, Oahu, and Kauai in support of the "Islands" project. In FY 89, 57 horizontal and 27 vertical control points were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,640 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Nineteen new editions of nautical charts and a new edition of Coast Pilot 7 covering Hawaii and the West Coast of the United States will be published during FY 90. These new chart editions are:

Name	Scale	Name
19010	675000	HAWAIIAN ISLANDS-SOUTHERN PART
19016	663392	NIIHAU TO FRENCH FRIGATE SHOALS
19019	653219	FRENCH FRIGATE SHOALS TO LAYSAN ISLAND
19022	642271	LAYSAN ISLAND TO KURE ISLAND
19324	10000	HILO BAY
19326	5000	PAAUHAU LANDING, ISLAND OF HAWAII
19329	5000	MAHUNKONA HARBOR AND APPROACHES ISLAND OF HAWAII
19330	10000	KAWAIHAE BAY-ISLAND OF HAWAII
19331	5000	KAILUA BAY-ISLAND OF HAWAII
19340	250000	HAWAII TO OAHU
19348	15000	APPROACHES TO LAHAINA, ISLAND OF MAUI
19357	80000	ISLAND OF OAHU

19358	20000	SOUTHEAST COAST OF OAHU WAIMANALO BAY TO DIAMOND HEAD
19359	15000	KANEOHE BAY OAHU-EAST COAST
19362	20000	SOUTH COAST OF OAHU, AHUA POINT TO BARBERS POINT
19421	100000	GARDNER PINNACLES AND APPROACHES
19442	40000	LISIANSKI ISLAND
19480	180000	GAMBIA SHOAL TO KURE ISLAND INCLUDING APPROACHES TO MIDWAY
19483	20000	KURE ISLAND

Aeronautical Charting. No OC/ODS's were published in FY 90.

4. Planned C&GS Initiatives in Hawaii During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS' 32 state affiliates of the NOAA/NOS automatic subscriber service in Hawaii. This also will improve services for ad hoc requestors from the State.

Nautical Charting. The C&GS is planning to publish 12 new editions of nautical charts for Hawaii during FY 92. These charts are:

Number	Scale	Name
530	4860700	SAN DIEGO TO ALEUTIN ISLANDS AND HAWAIIAN ISLANDS
19007	1650000	HAWAII TO FRENCH FRIGATE SHOALS
19010	675000	HAWAIIAN ISLANDS SOUTHERN PART
19013	675000	HAWAIIAN ISLANDS NORTHERN PART
19353	5000	KAUNAKAKAI HARBOR
19358	20000	SOUTHEAST COAST OF OAHU, WAIMANALO BAY TO DIAMOND HEAD
19361	10000	PORT WAIANAE ISLAND OF OAHU
19364	20000	SOUTH COAST OF OAHU DIAMOND HEAD TO PEARL HARBOR ENTRANCE
19385	20000	HAENA POINT TO KEPUHI POINT
19401	80000	FRENCH FRIGATE SHOALS
19402	25000	FRENCH FRIGATE SHOALS ANCHORAGE
19461	40000	PEARL AND HERMES REEF

A new edition of Coast Pilot 7 will be published annually.

In FY 92, NOAA Ship SURVEYOR will resume multibeam surveys of the Exclusive Economic Zone (EEZ) off the coast of Hawaii.

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 7 authorized NOS chart agents in the State can be improved during FY 92.

No OC/ODS's are planned for publication in FY 92.

5. Specific Issues of Interest to the State of Hawaii

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Minnesota

1. Name and Status of C&GS Programs for Minnesota During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 14,806 horizontal control points and 19,899 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement with Minnesota, a full-time resident geodetic advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Nautical Charting. There are 24 nautical charts which provide coverage of Minnesota's waters. A new edition for 15 of these charts and Coast Pilot 6 will be issued during FY 91. These charts are:

Number	Scale	Name
14960	600000	LAKE SUPERIOR
14961	600000	LAKE SUPERIOR-MERCATOR PROJECTION
14967	120000	BEAVER BAY TO PIGEON POINT
14982	42240	NORTH LAKE
14983	42240	NORTHERN LIGHT LAKE
14984	42240	SEA GULL LAKE
14985	42240	SAGANAGA LAKE
14986	42240	KNIFE LAKE
14987	42240	BASSWOOD LAKE-EASTERN PART
14988	42240	BASSWOOD LAKE-WESTERN PART
14989	42240	CROOKED LAKE
14990	10000	BASSWOOD RIVER
14991	42240	LAC LA CROIX

14996	25000	RAINY LAKE-BIG ISLAND MINN TO OAKPOINT ISLAND, ONTARIO
14997	25000	RAINY LAKE-DRYWEED ISLAND TO BIG ISLAND

There are 15 Nautical Chart Sales Agents in this state. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Five OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes four Sectional Charts and one Terminal Area Chart that are updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 4 Low and High Altitude Enroute Charts and 160 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Charts (STAR's).....4
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....18
  Category II ILS - special aircrew and aircraft
                certification required.....1

Category III A ILS - special aircrew and aircraft certification required.....0
Microwave Landing System (MLS).....1
Nonprecision Instrument Approach Charts:
Nondirectional Radio Beacon (NDB).....41
Very High Frequency Omni-Directional Range (VOR).....90
Area Navigation (RNAV).....5
Localizer (LOC).....4
Localizer Directional Aid (LDA).....0
Simplified Directional Facility.....0
Visual Approach Procedures.....0
Airport Diagrams.....5
TOTAL.....170

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Minnesota. The IAP's are updated on a 56-day cycle.

AIRLAKE
AITKIN MUNICIPAL
ALBERT LEA MUNICIPAL
ANOKA COUNTY-BLAINE AIRPORT/ JANES FIELD
AUSTIN MUNICIPAL
BAUDETTE INTERNATIONAL
BEMIDJI-BELTRAMI COUNTY
BENSON MUNICIPAL
BLOOMFIELD MUNICIPAL
BLUE EARTH MUNICIPAL
BRAINERD-CROW WING COUNTY/ WALTER F. WIELAND FIELD
BUFFALO MUNICIPAL
CAMBRIDGE MUNICIPAL
CHANDLER FIELD
CHISHOLM-HIBBING
CLOQUET CARLTON COUNTY
CROOKSTON MUNICIPAL- KIRKWOOD FIELD
CRYSTAL
DETROIT LAKES
DEVILS TRACK MUNICIPAL
DODGE CENTER
DULUTH INTERNATIONAL
ELY MUNICIPAL
EVELETH-VIRGINIA MUNICIPAL
FAIRMONT MUNICIPAL
FALLS INTERNATIONAL
FARIBAULT MUNICIPAL
FERGUS FALLS MUNICIPAL- EINAR MICKELSON FIELD
FLYING CLOUD
FOSSTON MUNICIPAL
GATEWAY NORTH INDUSTRIAL
GLENWOOD MUNICIPAL
GRAND RAPIDS-ITASCA COUNTY/ GORDON NEWSTROM FIELD
HALLOCK MUNICIPAL
HAWLEY MUNICIPAL
HOUSTON COUNTY
HUTCHINSON MUNICIPAL- BUTLER FIELD
JACKSON MUNICIPAL
LAKE ELMO
LITCHFIELD MUNICIPAL
LITTLE FALLS-MORRISON COUNTY
MADISON-LAC QUI PARLE COUNTY
MANKATO MUNICIPAL
MAPLE LAKE MUNICIPAL
MARSHALL MUNICIPAL- RYAN FIELD
MINNEAPOLIS-ST. PAUL INTERNATIONAL (WOLD CHAMBERLAIN)
MONTEVIDEO-CHIPPEWA COUNTY
MORA MUNICIPAL
MOREY FISH HOUSE
MORRIS MUNICIPAL
NEW ULM MUNICIPAL
OLIVIA MUNICIPAL
ORR REGIONAL
ORTONVILLE MUNICIPAL- MARTINSON FIELD
OWATONNA MUNICIPAL
PARK RAPIDS MUNICIPAL
PIPESTONE MUNICIPAL

RED WING MUNICIPAL
REDWOOD FALLS MUNICIPAL
ROCHESTER MUNICIPAL
ROSEAU MUNICIPAL
RUSHFORD MUNICIPAL
SKY HARBOR
SOUTH ST. PAUL MUNICIPAL-
RICHARD E. FLEMING FIELD
SPRINGFIELD MUNICIPAL
ST. CLOUD MUNICIPAL
ST. PAUL DOWNTOWN
HOLMAN FIELD
STAPLES MUNICIPAL
THIEF RIVER FALLS REGIONAL
WARROAD INTERNATIONAL-
SWEDE CARLSON FIELD
WASECA MUNICIPAL
WHEATON MUNICIPAL
WILLMAR MUNICIPAL-
JOHN L. RICE FIELD
WINDOM MUNICIPAL
WINONA MUNICIPAL-MAX CONRAD
FIELD
WORTHINGTON MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Minnesota. The SID's are updated on a 56-day cycle.

MINNEAPOLIS - ST. PAUL
INTERNATIONAL
(WOLD CHAMBERLAIN)

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Minnesota. The STAR's are updated on a 56-day cycle.

ANOKA COUNTY-BLAINE AIRPORT/
JANES FIELD
CRYSTAL
FLYING CLOUD
MINNEAPOLIS-ST. PAUL
INTERNATIONAL
(WOLD CHAMBERLAIN)
ST. PAUL DOWNTOWN -
HOLMAN FIELD

2. Current and Future Funding of C&GS Programs in the State of Minnesota

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 cost sharing)	80.0	1 part-time	80.0	1 part-time
Strain Network (1 station)	-	-	2.0	0.1
Aeronautical Charting	743.4	8.4	743.4	8.4
OC Program	105.0	1.5	126.0	1.8
Nautical Charting	36.3	0.7	7.3	0.1
TOTAL	964.7	11.1	958.7	10.9

3. Significant Past C&GS Involvement in the State of Minnesota

Geodesy. Six Calibration base lines were established in the State: Alexandria, Bagley, Rochester, St. Paul, Virginia, and Windom. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 2,878 kilometers (km) of releveling was accomplished in the State during the period FY 79-90. Fifteen stations were positioned by Global Positioning System (GPS) along the Minnesota part of the US/Canadian Boundary in FY 88.

In FY 89, 54 horizontal and 113 vertical control marks were recovered in the State.

In FY 90 NGSD performed geodetic control surveys at two-hundred stations by GPS as part of cooperative agreements with the FAA for the Airport Datum Monumentation program and the Minnesota Department of Transportation survey upgrades. One station was occupied by GPS in Grand Rapids as part of the U.S. Eastern Strain Network. Calibration base lines were verified in Windom, Rochester, St. Paul, Alexandria, Bagley, and Hayward.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 8,025 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. During FY 90, three new editions of nautical charts and a new edition of Coast Pilot 6 were issued for Minnesota's waters. The new chart editions were:

Number	Chart Description
14966	LITTLE GIRLS POINT TO SILVER BAY
14994	NAMAKAN LAKE-WESTERN PART AND KABETOGAMA LAKE-EASTERN PART
14999	LAKE OF THE WOODS

In FY 89, one new edition of nautical chart 14998 was published for Minnesota's near and offshore waters.

Aeronautical Charting. The following OC/ODS's were published in FY 90:

263	St. Paul	5182	Brainerd
5159	Hibbing	5755	Mankato
5174	Bemidji	6652	Lakeville

4. Planned C&GS Initiatives for the State of Minnesota During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS's 111 state affiliates of the NOAA/NOS automatic subscriber service in Minnesota. This also will improve services for ad hoc requestors from the State.

One station in Grand Rapids is planned to be reoccupied by GPS as part of the U.S. Eastern Strain Network.

Nautical Charting. The C&GS is planning to publish a new edition of Coast Pilot 6 and three existing nautical charts for FY 92. No topographic/bathymetric maps are planned to be published for Minnesota in FY 91 and FY 92. The new nautical chart issues will be:

Number	Scale	Name
14975	15000	DULUTH-SUPERIOR HARBOR-UPPER ST LOUIS RIVER
14992	42240	SANDY POINT LAKE TO LAC LA CROIX-INCLUDING CRANE LAKE AND LITTLE VERMILLION LAKE
14995	42240	WESTERN KABETOGAMA LAKE

Aeronautical Charting. Six OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 51 authorized NOS chart agents can be improved during FY 92.

5. Specific Issues of Interest to the State of Minnesota

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the

American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Michigan

1. Name and Status of C&GS' Programs for Michigan During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 6,845 horizontal control points and 13,553 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocations of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement with Michigan, a full-time resident geodetic advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Nautical Charting. In FY 91, shoreline mapping is scheduled along the northern shore of Lake Michigan. Ten shoreline maps are scheduled for production. These maps will be produced using photogrammetric techniques and instruments and will provide the graphic representation of selected features measured from aerial photographs. Feature delineation will include the shoreline, alongshore coastal features, and a narrow zone of natural and man-made features inland from the shore. Shoreline maps are primarily used to support nautical chart maintenance and new chart construction, hydrographic survey operations, and coastal management programs.

There are 55 nautical charts which provide coverage of the State's waters. New editions for 25 of these charts and Coast Pilot 6 will be issued during FY 91. These charts are:

Number	Scale	Name
14848	30000	DETROIT RIVER
14850	60000	LAKE ST CLAIR
14852	40000	ST CLAIR RIVER
14864	120000	HARRISVILLE TO FORTY MILE POINT
14867	20000	SAGINAW RIVER
14881	80000	DETOUR PASSAGE TO WAUGOSHANCE POINT

14882	40000	ST MARYS RIVER-LAKE HURON TO MUNUSCONG LAKE
14883	40000	ST MARYS RIVER-MUNUSCONG LAKE TO SAULT STE MARIE
14884	40000	ST MARYS RIVER TO WHITEFISH BAY
14885	20000	LES CHENEAUX ISLANDS
14901	500000	LAKE MICHIGAN-MERCATOR PROJECTION
14902	240000	NORTH END OF LAKE MICHIGAN-INCLUDING GREEN BAY
14905	120000	WAUKEGAN TO SOUTH HAVEN
14906	120000	SOUTH HAVEN TO STONY LAKE
14908	80000	DUTCH JOHNS POINT TO FISHERY POINT
14913	80000	GRAND TRAVERSE BAY TO LITTLE TRAVERSE BAY
14918	25000	HEAD OF GREEN BAY AND FOX RIVER BELOW DE PERE
14932	15000	HOLLAND HARBOR
14933	15000	GRAND HAVEN-SPRING LAKE AND LOWER GRAND RIVER
14934	15000	MUSKEGON AND MUSKEGON LAKE
14938	10000	MANISTEE AND MANISTEE LAKE
14942	30000	LAKE CHARLEVOIX
14960	600000	LAKE SUPERIOR
14961	600000	LAKE SUPERIOR-MERCATOR PROJECTION
14970	15000	MARQUETTE AND PRESQUE ISLE HARBOR

There are 134 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Ten OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes four Sectional Charts and one Terminal Area Chart that are updated every 6 months, and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 3 Low and High Altitude Enroute Charts and 231 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and the enroute portion of flight and for the transition between the enroute portion of flight and the landing.

Standard Instrument Departure Charts (SID's).....6
Standard Terminal Arrival Charts (STAR's).....0
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....37
  Category II ILS - special aircrew and aircraft
                certification required.....2
  Category III A ILS - special aircrew and aircraft
                certification required.....1
  Microwave Landing System (MLS).....1
Nonprecision Instrument Approach Charts:
  Nondirectional Radio Beacon (NDB).....44
  Very High Frequency Omni-Directional Range (VOR).....118
  Area Navigation (RNAV).....19
  Localizer (LOC).....8
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility.....1
Visual Approach Procedures.....0
Airport Diagrams.....14
TOTAL.....241

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Michigan. The IAP's are updated on a 56-day cycle.

ABRAMS MUNICIPAL
AL MEYERS
ALPENA COUNTY REGIONAL
ANN ARBOR MUNICIPAL
ANTRIM COUNTY
ATHELONE WILLIAMS MEMORIAL
BALDWIN MUNICIPAL
BERZ-MACOMB
BIG BEAVER
BISHOP INTERNATIONAL
BOYNE MOUNTAIN
BRANCH COUNTY MEMORIAL
BROOKS FIELD
CAPITAL CITY
CARO MUNICIPAL
CASS COUNTY MEMORIAL
CHARLEVOIX MUNICIPAL
CHEBOYGAN CITY-COUNTY
CHERRY CAPITAL
CHIPPEWA COUNTY INTERNATIONAL
CITY-COUNTY
CUSTER
DELTA COUNTY
DETROIT CITY
DETROIT METROPOLITAN-
  WAYNE COUNTY
DRUMMOND ISLAND
DUPONT-LAPEER

FITCH H. BEACH
FORD
GOGEBIC COUNTY
GRAND HAVEN MEMORIAL AIRPARK
GRATIOT COMMUNITY
GRAYLING AAF
GREENVILLE MUNICIPAL
GROSSE ILE MUNICIPAL
HARRY W. BROWNE
HASTINGS
HILLSDALE MUNICIPAL
HOUGHTON COUNTY MEMORIAL
HURON COUNTY MEMORIAL
IONIA COUNTY
IOSCO COUNTY
JACK BARSTOW
JACKSON COUNTY-
REYNOLDS FIELD
JAMES CLEMENTS MUNICIPAL
JERRY TYULER MEMORIAL
KALAMAZOO COUNTY
KENT COUNTY INTERNATIONAL
KIRSCH MUNICIPAL
LARSON
LENAWEE COUNTY
LIVINGSTON COUNTY
LUCE COUNTY HALE
MACKINAC ISLAND
MANISTEE COUNTY-BLACKER
MARLETTE
MARQUETTE COUNTY
MASON COUNTY
MASON JEWETT FIELD
MENOMINEE-MARINETTE TWIN
COUNTY
METTETAL-CANTON
MT. PLEASANT MUNICIPAL
FREMONT MUNICIPAL
GLADWIN
MUSKEGON COUNTY
NEW HUDSON
OAKLAND-PONTIAC
ONTONAGON COUNTY
OTSEGO COUNTY
OWOSSO COMMUNITY
PADGHAM FIELD
PARK TOWNSHIP
PELLSTON REGIONAL AIRPORT
OF EMMET COUNTY
PRESQUE ILSE COUNTY
PRICE'S
ROBEN-HOOD
ROMEO
ROSCOMMON COUNTY
ROSS FIELD-TWIN CITIES
SCHOOLCRAFT COMPANY
SOUTH HAVEN AREA REGIONAL
SPARTA
SPENCER FIELD
ST. CLAIR COUNTY
INTERNATIONAL
STANDISH INDUSTRIAL
TECUMSEH PRODUCTS
THREE RIVERS MUNICIPAL-
DR. HAINES
TOLEDO SUBURBAN
TRI-CITY INTERNATIONAL
TROY-OAKLAND
TULIP CITY
W. K. KELLOGG REGIONAL
WEST BRANCH COMMUNITY
WEXFORD COUNTY
WILLOW RUN

The following is a list of Standard Instrument Departure (SID) charts available for the state of Michigan. The SID's are updated on a 56-day cycle.

ANN ARBOR MUNICIPAL
DETROIT CITY
DETROIT METROPOLITAN-
WAYNE COUNTY
KENT COUNTY INTERNATIONAL
OAKLAND-PONTIAC
WILLOW RUN

2. Current and Future Funding of C&GS Programs in Michigan

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 cost sharing)	80.0	1 part-time	80.0	1 part-time
Strain Network (1 station)	-	-	2.0	0.1
Aeronautical Charting	666.7	7.6	666.7	7.6
OC Program	210.0	3.0	105.0	1.5
Hydrographic Field Party 2	133.4	3.0	28.0	0.6
Nautical Charting	60.5	1.1	38.7	0.7
TOTAL	1150.6	15.2	930.4	11.0

3. Significant Past C&GS Involvement in the State of Michigan During FY 90

Geodesy. Four Calibration Base lines were established in the State: Big Rapids, Detroit, Lansing, and Marquette.

In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,725 kilometers (km) of releveling was accomplished in the State during the period FY 82-86. During the period FY 69 through FY 79, 480 km of vertical control surveys were performed in Michigan for the Lake Survey Center. Lakes Superior, Huron, and Michigan together with the St. Mary and St. Clair Rivers were releveled.

In FY 89, 64 horizontal and 234 vertical control marks were recovered in the State.

In FY 90, NGSD performed geodetic control surveys at 63 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program and established over 400 stations by GPS as part of cooperative agreements with the Federal Aviation Administration and the Michigan Department of Transportation. The control was upgraded to first order and 20 new stations were positioned in the Detroit area. One station was occupied by GPS in Midland as part of the U.S. Eastern Strain Network. The Calibration base line in Lansing was verified.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,576 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Fourteen new shoreline maps were registered during FY 90. Eight maps provide coverage along the southern shore of Lake Superior and six maps cover the northeastern shoreline area of Lake Huron.

In FY 90, a new edition of Coast Pilot 6 and new editions of 14 nautical charts were published for Michigan's near and offshore waters. The new chart editions were:

Number	Chart Description
14830	WEST END OF LAKE ERIE
14847	TOLEDO HARBOR-ENTRANCE CHANNEL TO HARBOR
14860	LAKE HURON-GEORGIAN BAY-NORTH CHANNEL
14862	PORT HURON TO PTE AUX BARQUES
14880	STRAITS OF MACKINAC
14881	DETOUR PASSAGE TO WAUGOSHANCE POINT
14882	ST MARYS RIVER-DETOUR TO MUNUSCONG LAKE
14907	STONY LAKE TO POINT BETSIE
14917	MENOMINEE AND MARINETTE HARBORS
14937	LUDINGTON AND PERE MARQUETTE LAKE
14962	ST MARYS RIVER TO AU SABLE POINT
14963	GRAND MARIAIS TO BIG BAY POINT
14966	LITTLE GIRLS POINT TO SILVER BAY-INCLUDING DULUTH AND APOSTLE ISLANDS
14973	APOSTLE ISLANDS-INCLUDING CHEQUAMEGAN BAY

Aeronautical Charting. The following OC/ODS's were published in FY 90:

278 Muskegon

4. Planned C&GS Initiatives for the State of Michigan During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS' 87 state affiliates of the NOAA/NOS automatic subscriber service in Michigan. This also will improve services for ad hoc requestors from the State.

A geodetic control survey is planned to be performed by GPS in Lansing as part of the U.S. Eastern Strain Network.

Nautical Charting. In FY 92, shoreline mapping is scheduled for the eastern shore of Lake Michigan. Six shoreline maps covering the northern shore area of Green Bay will be produced.

The C&GS is planning to publish a new edition of Coast Pilot 6 and new editions of 16 nautical charts for FY 92. No topographic/bathymetric maps are planned to be published for Michigan in FY 92. The new chart editions are:

Number	Scale	Name
14830	100000	WEST END OF LAKE ERIE
14846	VARIOUS	PTE MOUILLEE TO TOLEDO TO PORT CLINTON
14850	60000	LAKE ST CLAIR
14852	40000	ST CLAIR RIVER
14854	15000	TRENTON CHANNEL AND ROUGE RIVER
14860	500000	LAKE HURON-GEORGIAN BAY-NORTH CHANNEL
14863	120000	SAGINAW BAY
14865	15000	SOUTH END OF LAKE HURON
14902	240000	NORTH END OF LAKE MICHIGAN-INCLUDING GREEN BAY
14935	10000	WHITE LAKE
14939	10000	PORTAGE LAKE
14964	120000	BIG BAY POINT TO REDRIDGE-INCLUDING KEWEENAW PENINSULA AND KEWEENAW WATERWAY
14965	120000	REDRIDGE TO SAXON HARBOR
14969	30000	MUNISING HARBOR-INCLUDING GRAND ISLAND
14971	30000	KEWENAW BAY, LANSE AND BARAGA HARBORS
14972	30000	KEWEENAW WATERWAY-INCLUDING TORCH LAKE

Aeronautical Charting. Five OC/ODS's are planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 56 authorized NOS chart agents can be improved during FY 92.

5. Specific Issues of Interest to the State of Michigan

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Wisconsin

1. Name and Status of C&GS Programs for the State of Wisconsin During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 7,300 horizontal control points and 7,357 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Nautical Charting. In FY 91, shoreline mapping is scheduled along the western shore of Green Bay. Five shoreline maps are scheduled for production. These maps will be produced using photogrammetric techniques and instruments and will provide the graphic representation of selected features measured from aerial photographs. Feature delineation will include the shoreline, alongshore coastal features, and a narrow zone of natural and man-made features inland from the shore. Shoreline maps are primarily used to support nautical chart maintenance and new chart construction, hydrographic survey operations, and coastal management programs.

There are 21 nautical charts and four topographic/bathymetric maps which provide coverage of the State's waters. New editions for five nautical charts and Coast Pilot 6 will be issued during FY 91. These charts are:

Number	Scale	Name
14901	500000	LAKE MICHIGAN-MERCATOR PROJECTION
14902	240000	NORTH END OF LAKE MICHIGAN-GREEN BAY
14918	25000	HEAD OF GREEN BAY AND FOX RIVER BELOW DE PERE

14960	600000	LAKE SUPERIOR
14961	600000	LAKE SUPERIOR-MERCATOR PROJECTION

There are 33 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes three Sectional Charts and one Terminal Area Chart that are updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 4 Low and High Altitude Enroute Charts and 170 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Charts (STAR's).....0
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....19

Category II ILS - special aircrew and aircraft certification required.....1
Category III A ILS - special aircrew and aircraft certification required.....0
Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
Nondirectional Radio Beacon (NDB).....57
Very High Frequency Omni-Directional Range (VOR).....68
Area Navigation (RNAV).....12
Localizer (LOC) and Localizer Backcourse (LOCBC).....9
Localizer Directional Aid (LDA).....0
Simplified Directional Facility.....4
Visual Approach Procedures.....0
Airport Diagrams.....5
TOTAL.....176

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Wisconsin. The IAP's are updated on a 56-day cycle.

ALEXANDER FIELD-SOUTH WOOD COUNTY
AMERICANA
AMERY MUNICIPAL
AUSTIN STRAUBEL FIELD
BARABOO WISCONSIN DELLS
DELOIT
BLACK RIVER FALLS AREA
BOSCOBEL
BURLINTON MUNICIPAL
BURNETT COUNTY
CABLE UNION
CARTER
CENTRAL WISCONSIN
CHETEK MUNICIPAL-SOUTHWORTH
CLINTONVILLE MUNICIPAL
CUMBERLAND MUNICIPAL
DANE COUNTY REGIONAL-TRUAX FIELD
DECATUR
DODGE COUNTY
DOOR COUNTY, CHERRYLAND
EAGLE RIVER UNION
EAU CLAIRE COUNTY
FOND DU LAC COUNTY
GENERAL MITCHELL INTERNATIONAL
GRANT COUNTY
GRANTSBURG MUNICIPAL
HARTFORD MUNICIPAL
HAYWARD MUNICIPAL
HORLICK-RACINE
IOWA COUNTY
JOHN F. KENNEDY MEMORIAL
KENOSHA MUNICIPAL
KING'S LAND O'LAKES
L.O. SIMENSTAD MUNICIPAL
LA CROSSE MUNICIPAL
LAKE LAWN
LANGLADE COUNTY
LAWRENCE J. TIMMERMAN
MANITOWOC COUNTY
MARSHFIELD MUNICIPAL
MERRILL MUNICIPAL
MINNEAPOLIS-ST PAUL INTERNATIONAL (WOLD CHAMBERLAIN)
MONMOUTH MUNICIPAL
MONROE MUNICIPAL
MOREY
MT. VERNON-OUTLAND
NEILLSVILLE MUNICIPAL
NEW HOLSTEIN MUNICIPAL
NEW RICHMOND MUNICIPAL
NOBLE F. LEE MEMORIAL FIELD
OCONTO MUNICIPAL
OUTAGAMIE COUNTY
PORTAGE MUNICIPAL
PRAIRIE DU CHIEN MUNICIPAL
PRICE COUNTY
REEDSBURG MUNICIPAL
RHINELANDER-ONEIDA COUNTY
RICE LAKE MUNICIPAL
RICHARD I. BONG

RICHLAND
ROCK COUNTY
RUSK COUNTY
SHEBOYGAN COUNTY MEMORIAL
SHELL LAKE MUNICIPAL
SALON SPRINGS MUNICIPAL
SPARTA/FORT MCCOY
STEVENS POINT MUNICIPAL
TAYLOR COUNTY
TRI-COUNTY REGIONAL
WATERTOWN MUNICIPAL
WAUKESHA COUNTY
WAUPACA MUNICIPAL
WAUSAU MUNICIPAL
WEST BEND MUNICIPAL
WITTMAN REGIONAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Wisconsin. The SID's are updated on a 56-day cycle.

GENERAL MITCHELL
INTERNATIONAL

2. Current and Future Funding of C&GS Programs in Wisconsin

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing	80.0	1 part-time	80.0	1 part-time
Strain Network (1 station)	-	-	2.0	0.1
OC Program	42.0	0.3	42.0	0.3
Aeronautical Charting	755.2	8.6	755.2	8.6
Nautical Charting	14.5	0.3	10.0	0.2
TOTAL	891.7	9.7	889.2	9.7

3. Significant Past C&GS Involvement in the State of Wisconsin

Geodesy. Eight calibration base lines were established in the State: Eau Claire, Green Bay, Hayward, LaCrosse, Madison, Rhinelander, Waukesha, and Wisconsin Rapids. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,527 kilometers (km) of releveling was accomplished in the State during the period FY 79-85.

From FY 86-90 NGSD provided Federal financial support to the University of Wisconsin for continued partial support of the publication of the Wisconsin Land Records Committee's Newsletter, which disseminates research findings in the area of modernized land records systems. Support was also provided in FY 88 for the

assessment of the accuracy of digital cadastral maps in Dane County, Wisconsin.

In FY 89, 76 horizontal and 34 vertical control marks were recovered in the State. In FY 89, GPS surveys (57 points) were completed in Dane County.

In FY 90, geodetic control surveys were performed at 47 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program. One station was occupied by GPS in Baraboo as part of the U.S. Eastern Strain Network. Calibration base lines were verified in Hayward, Rhinelander, Green Bay, and Madison.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,529 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. A new edition of Coast Pilot 6 and four new editions of these charts were published during FY 89. In FY 90, a new edition of Coast Pilot 6 and five new editions of existing nautical charts were published for Wisconsin's waters. The new chart editions were:

Number	Chart Description
14904	PORT WASHINGTON TO WAUKEGAN
14917	MENOMINEE AND MARINETTE HARBORS
14919	STURGEON BAY AND CANAL
14966	LITTLE GIRLS POINT TO SILVER BAY-INCLUDING DULUTH AND APOSTLE ISLANDS
14973	APOSTLE ISLANDS-INCLUDING CHEQUAMEGAN BAY

In FY 90, there were no topographic/bathymetric maps published for Wisconsin.

Aeronautical Charting. The following OC/ODS's were published in FY 90:

219	La Cross
730	Oshkosh
938	Janesville
937	Eau Claire
5216	Appleton

4. Planned C&GS Initiatives in Wisconsin During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS's 77 state affiliates of the NOAA/NOS automatic subscriber service in Wisconsin. This also will improve services for ad hoc requestors from the State.

One station is planned to be reoccupied by GPS in Baraboo as part of the U.S. Eastern Strain Network.

Nautical Charting. In FY 92, shoreline mapping is schedule for the western shore area of Green Bay and the eastern shore of Lake Michigan in the vincinity of Sturgeon Bay. Ten shoreline maps will be produced.

The C&GS is planning to publish a new edition of Coast Pilot 6 and new editions of four nautical charts for FY 92. These new chart editions are:

Number	Scale	Name
14902	240000	NORTH END OF LAKE MICHIGAN-INCLUDING GREEN BAY
14925	10000	RACINE HARBOR
14965	120000	REDRIDGE TO SAXON HARBOR
14975	15000	DULUTH-SUPERIOR HARBOR-UPPER ST LOUIS RIVER

No topographic/bathymetric maps are planned to be published for Wisconsin in FY 92.

Aeronautical Charting. Two OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 56 authorized NOS chart agents can be improved during FY 92.

5. Specific Issues of Interest to the State of Wisconsin

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

The Statewide High Accuracy GPS Network covering the State of Wisconsin contains 80 stations. Spacing between adjacent stations is approximately 30 kilometers. Two U.S. Eastern Strain Network stations, ROCK and RIVERSIDE, are included in the network. The network will be referenced to the National Crustal Motion Network (NCMN) by observing five stations of the statewide network, ARCADIA, MANITOWOC, NIAGARA, and the two strain stations simultaneously with tracking stations of the Cooperative International GPS Network (CIGNET) during a minimum of three observing days. This network is being established as a cooperative activity between the Wisconsin Department of Transportation (WDOT) and the National Geodetic Survey Division (NGSD). Mr. Paul Harzheim, WDOT, coordinated the State's effort in establishing the network.

Field observations which were begun in Summer 1990 are being performed by private industry under contract to WDOT. All project data will be submitted to NGSD for evaluation and acceptance.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Illinois

1. Name and Status of C&GS Programs for Illinois During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 8,206 horizontal control points and 13,029 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

In FY 91, geodetic control surveys will be performed at 51 airports in support of the Federal Aviation Administration's Airport Datum Monumentation program.

Nautical Charting. There are eight nautical charts which provide coverage of the State's waters. New editions of two nautical charts and Coast Pilot 6 will be issued during FY 91. These charts are:

Number	Scale	Name
14905	120000	WAUKEGAN TO SOUTH HAVEN
14928	15000	CHICAGO HARBOR

There are 19 Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational

aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

One OC/ODS is planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes three Sectional Charts and two Terminal Area Charts that are updated every 6 months, and two World Aeronautical Chart that are updated annually. Instrument chart coverage includes 5 Low and High Altitude Enroute Charts and 196 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's)..... 6
Standard Terminal Arrival Charts (STAR's)..... 2
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....41
  Category II ILS - special aircrew and aircraft
                certification required..... 2
  Category III A ILS - special aircrew and aircraft
                certification required..... 1
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Non-Directional Radio Beacon (NDB).....52
  Very High Frequency Omni-Directional Range (VOR).....75
  Area Navigation (RNAV).....12
  Localizer (LOC) and Localizer Backcourse (LOCBC).....11
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility.....0

Visual Approach Procedures.....2
Airport Diagrams.....11
TOTAL 215

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Illinois. The IAPs are updated on a 56-day cycle.

ALBERTUS
AURORA MUNICIPAL
BELVIDERE LTD
BLOOMINGTON/NORMAL
CAIRO
CAMPBELL
CAPITAL
CARMI MUNICIPAL
CASEY MUNICIPAL
CENTRALIA MUNICIPAL
CHICAGO MIDWAY
CHICAGO O'HARE INTERNATIONAL
CLOW INTERNATIONAL
COLES COUNTY MEMORIAL
DE KALB TAYLOR MUNICIPAL
DECATUR
DIXON MUNICIPAL -
CHARLES R. WALGREEN FIELD
DU PAGE
DWIGHT
EDGAR COUNTY
EFFINGHAM COUNTY MEMORIAL
FAIRFIELD MUNICIPAL
FLORA MUNICIPAL
FRANKFORT
FRASCA FIELD
GALESBURG MUNICIPAL
GALT
GIBSON CITY MUNICIPAL
GLENVIEW NAS
GREATER PEORIA REGIONAL
GREATER ROCKFORD
GREATER KANKAKEE
GREENVILLE
HARRISBURG-RALEIGH
ILLINOIS VALLEY REGIONAL-
WALTER A. DUNCAN FIELD
INGERSOLL
JACKSONVILLE MUNICIPAL
JOLIET PARK DISTRICT
KEWANEE MUNICIPAL
LAKE IN THE HILLS
LAMBERT-ST. LOUIS
INTERNATIONAL
LANSING MUNICIPAL
LAWRENCEVILLE-VINCENNES
INTERNATIONAL
LEWIS
LITCHFIELD MUNICIPAL
LOGAN COUNTY
MACOMB MUNICIPAL
MARSHALL COUNTY
MERRILL C. MEIGS
MONMOUTH MUNICIPAL
MONTICELLO AVIATION INC.
MORRIS MUNICIPAL
MT. CARMEL MUNICIPAL
MT. HAWLEY AUXILIARY
MT. VERNON-OUTLAND
OLNEY-NOBLE
PAL-WAUKEE
PAXTON
PEKIN MUNICIPAL
PINCKNEYVILLE-DU QUOIN
PITTSFIELD PENSTONE MUNICIPAL
PONTIAC MUNICIPAL
QUAD-CITY
QUINCY MUNICIPAL-
BALDWIN FIELD
ROBINSON MUNICIPAL
ROCHELLE MUNICIPAL
SALEM-LECKRONE
SANGER
SCOTT AFB
SHAFER METRO EAST
SHELBY COUNTY
SOUTHERN ILLINOIS
SPARTA COMMUNITY-
HUNTER FIELD
ST. LOUIS DOWNTOWN-PARKS
ST. LOUIS REGIONAL
TAYLORVILLE MUNICIPAL
UNIVERSITY OF ILLINOIS-WILLARD
VANDALIA MUNICIPAL
VERMILION COUNTY
WADDELL
WAUKEGAN REGIONAL

WHITESIDE COUNTY-JOSEPH H. BITTORF FIELD

WILLIAMSON COUNTY REGIONAL

The following is a list of Standard Instrument Departure (SID) charts available for the State of Illinois. The SID's are updated on a 56-day cycle.

CHICAGO MIDWAY
CHICAGO O'HARE INTERNATIONAL
PAL-WAUKEE
QUAD-CITY
ST. LOUIS DOWNTOWN-PARKS
ST. LOUIS REGIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the State of Illinois. The STAR's are updated on a 56-day cycle.

CHICAGO MIDWAY
CHICAGO O'HARE
GARY REGIONAL
MERRILL C MEIGS

2. Current and Future Funding of C&GS Programs in Illinois

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time
Geodetic Control Surveys:				
51 FAA Airports	433.5	9.6	-	-
NGRS Leveling (290 km)	-	-	116.0	2.6
Strain Network (1 station)	-	-	2.0	0.1
OC Program	21.0	0.3	42.0	0.6
Aeronautical Charting	902.7	10.3	902.7	10.3
Nautical Charting	4.8	0.1	2.5	0.1
TOTAL	1442.0	20.8	1145.2	14.2

3. Significant Past C&GS Involvement in Illinois

Geodesy. Three Calibration Base Lines were established in the State: Chicago, Gerstenschlager, and Urbana.

In 1977, horizontal surveys were conducted to help the City of Chicago develop a mapping program as well as to improve the accuracy of its land boundaries. In 1981, first-order vertical

control surveys were performed along the Mississippi River at the request of the U.S. Army Corps of Engineers. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 309 kilometers (km) of releveling was accomplished in the State during the period FY 86-87. In FY 89, 88 horizontal and 174 vertical control points were recovered in the State.

In FY 90 several geodetic control surveys were performed where 170 stations were occupied by GPS as part of cooperative agreements with the FAA and the Illinois Department of Transportation. The agreements are to establish geodetic control at 54 airports as part of the ADAM project and to upgrade that control to first order to establish a statewide High Precision Geodetic Network. One station was occupied in Marion as part of the U.S. Eastern Strain Network. A new Calibration base line was established in Carbondale, and existing CBLs were verified in Chicago and Urbana.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 4,136 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. A new edition of Coast Pilot 6 and new editions of charts 14901 and 14905, Great Lakes, were published during FY 89. In FY 90, a new edition of Coast Pilot 6 and four new editions of nautical charts were published for Illinois' near and offshore waters. These charts were:

Number	Chart Description
14904	PORT WASHINGTON TO WAUKEGAN
14926	CHICAGO AND SOUTH SHORE OF LAKE MICHIGAN
14927	CHICAGO LAKE FRONT-WILMETTE TO GARY
14929	CALUMET-INDIANA AND BUFFINGTON HARBORS

Aeronautical Charting. The following OC/ODS's were published in FY 90:

518	Springfield
954	Rockford
710	Decatur
5058	Bloomington
5180	Mattoon
5215	Marion

4. Planned C&GS Initiatives in Illinois During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS' 94 state affiliates of the NOAA/NOS automatic subscriber service in Illinois. This also will improve services for ad hoc requestors from the State.

One geodetic control survey station is planned to be reoccupied in Marion as part of the U.S. Eastern Strain Network.

In support of NGRS 290 kms of leveling will be performed.

Nautical Charting. The C&GS is planning to publish a new edition of Coast Pilot 6 and one new edition of existing nautical charts for FY 92. This chart edition is:

Number	Scale	Name
14927	60000	CHICAGO LAKE FRONT-WILMETTE TO GARY

No topographic/bathymetric maps are planned to be published for Illinois in FY 92.

Aeronautical Charting. Two OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 79 authorized NOS chart agents can be improved during FY 92.

5. Specific Issues of Interest to the State of Illinois

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the

American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Indiana

1. Name and Status of C&GS Programs for Indiana During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 7,589 horizontal control points and 14,632 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

In support of NGRS 840 kms of leveling will be performed.

Nautical Charting. There are five nautical charts which provide coverage of the State's waters. New editions of two nautical charts and Coast Pilot 6 will be issued during FY 91. These charts are:

Number	Scale	Name
14901	500000	LAKE MICHIGAN-MERCATOR PROJECTION
14905	120000	WAUKEGAN TO SOUTH HAVEN

There are six Nautical Chart Sales Agents in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Nine OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes four Sectional Charts and one terminal area chart which are updated every 6 months, and three World Aeronautical Chart that are updated annually. Instrument chart coverage includes 5 Low and High Altitude Enroute Charts and 162 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Charts (STAR's).....1
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....24
  Category II ILS - special aircrew and aircraft
                  certification required.....1
  Category III A ILS - special aircrew and aircraft
                  certification required 0
  Microwave Landing System (MLS)..... 0
Nonprecision Instrument Approach Charts
  Non-Directional Radio Beacon (NDB).....42
  High Frequency Omni-Directional Range (VOR).....76
  Area Navigation (RNAV)..... 10
  Localizer (LOC) and Localizer Backcourse (LOCBC).....7
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility.....2
Visual Approach Procedures.....0
Airport Diagrams.....5
TOTAL 169

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Indiana. The IAP's are updated on a 56-day cycle.

ALEXANDRIA
ANDERSON MUNICIPAL
ARENS FIELD
ARETZ
BRAZIL CLAY COUNTY
CLARK COUNTY
COLUMBUS MUNICIPAL
CRAWFORDSVILLE MUNICIPAL
DAVIESS COUNTY
DEKALB COUNTY
DELAWARE COUNTY-
JOHNSON FIELD
EAGLE CREEK AIRPARK
ELKHART MUNICIPAL
EVANSVILLE DRESS REGIONAL
EVANSVILLE REGIONAL
FORT WAYNE MUNICIPAL-
BAER FIELD
FRANKFORT MUNICIPAL
FREEMAN MUNICIPAL
FRENCH LICK MUNICIPAL
FULTON COUNTY
GARY REGIONAL
GOSHEN MUNICIPAL
GREENSBURG-DECATUR COUNTY
GREENWOOD MUNICIPAL
GRIFFITH
GRISSOM AFB
HULMAN REGIONAL
HUNTINGBURG
HUNTINGTON MUNICIPAL
INDIANAPOLIS BROOKSIDE
INDIANAPOLIS DOWNTOWN
HELIPORT
INDIANAPOLIS INTERNATIONAL
INDIANAPOLIS METROPOLITAN
INDIANAPOLIS TERRY
JASPER COUNTY
KENDALLVILLE MUNICIPAL
KENTLAND MUNICIPAL
KOKOMO MUNICIPAL
LA PORTE MUNICIPAL
LANSING MUNICIPAL
LOGANSPORT MUNICIPAL
LOWELL
MADISON MUNICIPAL
MARION MUNICIPAL
METTEL FIELD
MICHIANA REGIONAL
MICHIGAN CITY
MONROE COUNTY
MOUNT COMFORT
MT. COMFORT
NAPPANEE MUNICIPAL
NEIL ARMSTRONG
NEW CASTLE -
HENRY COUNTY MUNICIPAL
NORTH VERNON
O'NEAL
PERRY COUNTY MUNICIPAL
PERU MUNICIPAL
PLYMOUTH MUNICIPAL
PORTER COUNTY MUNICIPAL
PORTLAND MUNICIPAL
PURDUE UNIVERSITY
PUTNAM COUNTY
RANDOLPH COUNTY
RICHMOND MUNICIPAL
SHELBYVILLE MUNICIPAL
SHERIDAN
SKY KING
SMITH FIELD
SPEEDWAY
STARKE COUNTY
SULLIVAN COUNTY
TRI-STATE STEUBEN COUNTY
VIRGIL I. GRISSOM MUNICIPAL
WABASH MUNICIPAL
WARSAW MUNICIPAL
WHITE COUNTY

The following is a list of Standard Instrument Departure (SID) charts available for the State of Indiana. The SID's are updated on a 56-day cycle.

INDIANAPOLIS INTERNATIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the State of Indiana. The STAR's are updated on a 56-day cycle.

EAGLE CREEK AIRPARK
INDIANAPOLIS INTERNATIONAL
MOUNT COMFORT

2. Current and Future Funding of C&GS Programs in Indiana

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys:				
NGRS Leveling (840 km)	336.0	7.5	-	-
Strain Network (1 station)	-	-	2.0	0.1
Aeronautical Charting	761.1	8.6	761.1	8.6
OC Program	189.0	2.7	105.0	1.5
Nautical Charting	4.8	0.1	2.5	0.1
TOTAL	1290.9	18.9	870.6	10.3

3. Significant Past C&GS Involvement in Indiana

Geodesy. One Calibration Base Line was established in the State at South Bend. In support of the North America Vertical Datum (NAVD) readadjustment project, a total of 890 kilometers (km) of releveling was accomplished in the State during the period FY 86-87. In FY 89, 48 horizontal and 246 vertical control points were recovered in the state.

Geodetic control surveys in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program were completed during FY 89 at 51 airports within the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,884 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83, project.

In FY 90, a geodetic control survey was performed by GPS at a station in Bloomington as part of the U.S. Eastern Strain Network. A Calibration base line was verified in South Bend.

Nautical Charting. A new edition of Coast Pilot 6 and one new edition of chart 14901 were published during FY 89. In FY 90, a new edition of Coast Pilot 6 and three new editions of existing nautical charts were published for Indiana's near and offshore waters. These charts were:

Number	Chart Description
14926	CHICAGO AND SOUTH SHORE OF LAKE MICHIGAN
14927	CHICAGO LAKE FRONT-WILMETTE TO GARY
14929	CALUMET-INDIANA AND BUFFINGTON HARBORS

Aeronautical Charting. The following OC/ODS's were published in FY 90:

171 Goshen
6715 Jeffersonville

4. Planned C&GS Initiatives in Indiana During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS' 57 state affiliates of the NOAA/NOS automatic subscriber service in Indiana. This also will improve services for ad hoc requestors from the State.

A geodetic control survey is planned to be performed by GPS at a station in Bloomington as part of the U.S. Eastern Strain Network.

Nautical Charting. The C&GS is planning to publish a new edition of Coast Pilot 6 and one new edition of existing nautical charts for FY 92. No topographic/bathymetric maps are planned to be published for Indiana in FY 92. The new nautical chart edition is:

Number	Scale	Name
14927	60000	CHICAGO LAKE FRONT-WILMETTE TO GARY

Aeronautical Charting. Five OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 58 authorized NOS chart agents can be improved during FY 92.

5. Specific Issues of Interest to the State of Indiana

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Ohio

1. Name and Status of C&GS' Programs for Ohio During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 6,680 horizontal control points and 14,378 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

420 kms of leveling will be performed in support of NGRS.

Nautical Charting. There are 18 nautical charts which provide coverage of the State's waters. During FY 91, six new editions of nautical charts and Coast Pilot 6 will be issued for Ohio. These charts are:

Number	Scale	Name
14820	400000	LAKE ERIE
14824	80000	SIXTEENMILE CREEK TO CONNEAUT HARBOR
14829	100000	GENEVA TO LORAIN
14836	5000	ASHTABULA HARBOR
14837	8000	FAIRPORT HARBOR
14844	40000	ISLANDS IN LAKE ERIE

There are 52 Nautical Sales Charts in this State. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations

Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Three OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes three Sectional Charts and two Terminal Area Charts that are updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 7 Low and High Altitude Enroute Charts and 224 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....3
Standard Terminal Arrival Charts (STAR's).....4
Precision Instrument Approach Charts:
  Instrument Landing System (ILS).....28
  Category II ILS - special aircrew and aircraft
    certification required.....2
  Category III A ILS - special aircrew and aircraft
    certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Instrument Approach Charts:
  Non-Directional Radio Beacon (NDB).....73
  Very High Frequency Omni-Directional Range (VOR).....88
  Area Navigation (RNAV).....23
  Localizer (LOC) and Localizer Backcourse (LOCBC).....8
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility.....2

Visual Approach Procedures.....0
Airport Diagrams.....9
TOTAL 239

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Ohio. The IAPs are updated on a 56-day cycle.

AIRBORNE AIRPARK
AKRON FULTON INTERNATIONAL
AKRON-CANTON REGIONAL
ALDERMAN
ALEXANDER SALAMON
ASHLAND COUNTY
ASHTABULA-JEFFERSON
ASHTABULA COUNTY
BARNESVILLE-BRADFIELD
BEACH CITY
BELLEFONTAINE MUNICIPAL
BERLIN AIRPARK
BLUFFTON
BOLTON FIELD
BROWN COUNTY
BUCKEYE EXECUTIVE
BURKE LAKEFRONT
CAMBRIDGE MUNICIPAL
CARL R. KELLER FIELD
CARROLL COUNTY-TOLSON
CASEMENT
CINCINNATI MUNICIPAL
AIRPORT-LUNKEN FIELD
CINCINNATI WEST
CINCINNATI-BLUE ASH
CLERMONT COUNTY
CLEVELAND-HOPKINS
INTERNATIONAL
COLUMBIANA CO.
CONCORD AIRPARK
CUYAHOGA COUNTY
DARKE COUNTY
DAYTON GENERAL (SOUTH)
DEFIANCE MEMORIAL
DELAWARE MUNICIPAL
ELYRIA
FAIRFIELD COUNTY
FAYETTE COUNTY
FINDLAY
FOSTORIA METROPOLITAN
FREMONT
FULTON COUNTY
GALION MUNICIPAL
GALLIA-MEIGS REGIONAL
GEAUGA COUNTY
GREATER PORTSMOUTH REGIONAL
GREENE COUNTY
GRIFFING SANDUSKY
GRIMES FIELD
HAMILTON-FAIRFIELD
HARDIN COUNTY
HARRISON COUNTY
HARRY CLEVER FIELD
HENRY COUNTY
HIGHLAND COUNTY
HOLMES COUNTY
HOOK FIELD MUNICIPAL
JAMES A. RHODES
JAMES M. COX -
DAYTON INTERNATIONAL
KENT STATE UNIVERSITY
KNOX COUNTY
LAKEFIELD
LANDSDOWNE
LEBANON-WARREN COUNTY
LIMA ALLEN COUNTY
LORAIN COUNTY REGIONAL
LOST NATION
MADISON COUNTY
MANSFIELD-LAHM MUNICIPAL
MARION MUNICIPAL
MEDINA MUNICIPAL
METCALF FIELD
MIAMI UNIVERSITY
MONROE COUNTY
MORROW COUNTY
NEIL ARMSTRONG
NEWARK-HEATH
NORWALK-HURON COUNTY
OHIO STATE UNIVERSITY
OHIO UNIVERSITY
PERRY COUNTY
PHILLIPSBURG
PICKAWAY COUNTY MEMORIAL
PIQUA
PORT BUCYRUS-CRAWFORD COUNTY
PORT COLUMBUS INTERNATIONAL
PORTAGE COUNTY

PUTNAM COUNTY
RICHARD DOWNING
RICKENBACKER ANGB
ROSS COUNTY
SALEM AIRPARK INC.
SENECA COUNTY
SHELBY COMMUNITY
SIDNEY MUNICIPAL
SPRINGFIELD-BECKLEY MUNICIPAL
TOLEDO EXPRESS
TRI-CITY
UNION COUNTY
VAN WERT COUNTY
WADSWORTH MUNICIPAL
WAYNE COUNTY
WILLARD
WILLIAMS COUNTY
WOOD COUNTY
WYANDOT COUNTY
YOUNGSTOWN EXECUTIVE
YOUNGSTOWN MUNICIPAL
ZANESVILLE MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Ohio. The SID's are updated on a 56-day cycle.

BURKE LAKEFRONT
CINCINNATI MUNICIPAL AIRPORT -LUNKEN FIELD
CLEVELAND HOPKINS INTERNATIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Ohio. The STARs are updated on a 56-day cycle.

CINCINNATI MUNICIPAL AIRPORT-LUNKEN FIELD
JAMES M. COX - DAYTON INTERNATIONAL
GREATER CINCINNATI INTERNATIONAL
SPRINGFIELD-BECKLEY MUNICIPAL
WRIGHT PATTERSON

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

The OC and ODS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements. Six Airport Obstruction Charts are scheduled to be published in FY 89.

2. Current and Future Funding of C&GS Programs in Ohio

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time
Geodetic Control Surveys:				
NGRS Leveling (420 kms)	168.0	3.7	-	-
Strain Network (1 station)	-	-	2.0	0.1
OC Program	63.0	0.3	63.0	-
Aeronautical Charting	1038.4	11.8	1038.4	11.8
Nautical Charting	14.5	0.3	10.0	0.2
TOTAL	1363.9	16.6	1193.4	12.6

3. Significant Past C&GS Involvement in the State of Ohio for FY 90

Geodesy. Nine calibration base lines were established in the State: Ashtabula Barnesville, Bolton, Cincinnati, Coshocton, Defiance, Ravenna, Treatylands, and Zanesville. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 866 kilometers (km) of releveling was accomplished in the State during the period FY 80-86.

During FY 87-88, geodetic control surveys were performed in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program at 89 airports within the State.

In FY 89, 29 horizontal and 136 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,625 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. A new edition of Coast Pilot 6 and two new editions of charts 14828 and 14844 were published during FY 89.

In FY 90, a new edition of Coast Pilot 6 and seven new editions of nautical charts were published for Ohio's near and off shore waters. These charts are:

Number	Chart Description
14820	LAKE ERIE
14825	ASHTABULA TO CHAGRIN RIVER
14826	MOSS POINT TO VERMILION
14830	WEST END OF LAKE ERIE
14839	CLEVELAND HARBOR-INCLUDING LOWER CUYAHOGA RIVER
14845	SANDUSKY HARBOR
14847	TOLEDO HARBOR-ENTRANCE TO CHANNEL HARBOR

Aeronautical Charting. The following OC/ODS's were published in FY 90:

83	Cincinnati
5370	Cleveland (Burke)
5387	Columbus (Ohio State)
5958	Columbus (Bolton)

4. Planned C&GS Initiatives for the State of Ohio During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS's 123 state affiliates of the NOAA/NOS automatic subscriber service in Ohio. This also will improve services for ad hoc requestors from the State.

A geodetic control survey is planned to be performed by GPS at a station in Columbus as part of the U.S. Eastern Strain Network.

Nautical Charting. The C&GS is planning to publish four new editions of nautical charts for FY 92. New editions of Coast Pilot 6 are published annually. The new chart editions are:

Number	Scale	Name
14830	100000	WEST END OF LAKE ERIE
14841	10000	LORAIN HARBOR
14843	5000	HURON HARBOR
14846	VARIOUS	PTE MOUILLEE TO TOLEDO TO PORT CLINTON

Aeronautical Charting. Three OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 112 authorized NOS chart agents can be improved during FY 92. Three airport obstruction charts are scheduled to be published in FY 90.

5. Specific Issues of Interest to the State of Ohio

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for the Commonwealth of Pennsylvania

1. Name and Status of C&GS Programs for Pennsylvania During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 8,022 horizontal control points and 19,301 vertical control points in the Commonwealth.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Nautical Charting. There are seven nautical charts which provide coverage of the Commonwealth's waters. During FY 91, three new editions of these charts and Coast Pilot 6 will be published. These charts are:

Number	Scale	Name
14820	400000	LAKE ERIE
14823	80000	STURGEON POINT TWENTY MILE CREEK
14824	80000	SIXTEENMILE CREEK TO CONNEAUT HARBOR

There are 15 Nautical Chart Agents in Pennsylvania. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the Commonwealth.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Following is a list of OC's and ODS's to be published in FY 91:

15	Allentown
523	Philipsburg
5240	State College

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the Commonwealth. Visual chart coverage includes four Sectional Charts and two Terminal Area Charts that are updated every 6 months, and three World Aeronautical Charts that are updated annually. Instrument chart coverage includes 8 Low and High Altitude Enroute Charts and 170 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's)	11
Standard Terminal Arrival Charts (STAR's)	2
Precision Instrument Approach Charts:	
Instrument Landing System (ILS)	38
Category II ILS - special aircrew and aircraft certification required	2
Category III A ILS - special aircrew and aircraft certification required	0
Microwave Landing System (MLS)	0
Nonprecision Instrument Approach Charts:	
Nondirectional Radio Beacon (NDB)	20
Very High Frequency Omni-Directional Range (VOR)	76
Area Navigation (RNAV)	23
Localizer (LOC) and Localizer Backcourse (LOCBC)	11
Localizer Directional Aid (LDA)	0
Simplified Directional Facility	0
Visual Approach Procedures	0
Airport Diagrams	11
TOTAL	194

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Pennsylvania. The IAP's are updated on a 56-day cycle.

ALLEGHENY COUNTY
ALLENTOWN-BETHLEHEM-EASTON
BEAVER COUNTY
BEDFORD
BIRCHWOOD-POCONO AIRPARK
BLOOMSBURG MUNICIPAL
BOB SHANNON MEMORIAL FIELD
BRADFORD REGIONAL
BRANDYWINE
BUEHL FIELD
BUTLER COUNTY
CAPITAL CITY
CARLISLE
CHAMBERSBURG MUNICIPAL
CHERRY RIDGE
CHERRY SPRINGS
CHESS-LAMBERTON
CHESTER COUNTY-G.O. CARLSON
CLARION COUNTY
CLEARFIELD-LAWRENCE
CONNELLSVILLE
CORRY-LAWRENCE
DONEGAL SPRINGS AIRPARK
DOYLESTOWN
DUBOIS-JEFFERSON COUNTY
EASTON
EBENSBURG
ERIE INTERNATIONAL
GRAND CANYON STATE
GREATER PITTSBURGH
INTERNATIONAL
GREENVILLE MUNICIPAL
GROVE CITY
HARRISBURG INTERNATIONAL-
OLMSTED FIELD
HAZLETON MUNICIPAL
INDIANA COUNTY -
JIMMY STEWART FIELD
JAKE ARNER MEMORIAL
JOHNSTOWN-CAMBRIA COUNTY
LANCASTER
LANGHORNE/BUEHL FIELD
ALLENTOWN-QUEEN CITY MUNICIPAL
ALTOONA-BLAIR COUNTY
MID-STATE
MIFFLIN COUNTY
MILLARD
NAAS MUSTIN (ABANDONED)
NEW CASTLE MUNICIPAL
NEW GARDEN
NORTHEAST PHILADELPHIA
NORTHUMBERLAND COUNTY
PENN VALLEY
PENNRIDGE
PERKIOMEN VALLEY
PHILADELPHIA INTERNATIONAL
PITTSBURGH METRO
POCONO MOUNTAINS MUNICIPAL
PORT MEADVILLE
POTTSTOWN MUNICIPAL
POTTSTOWN-LIMERICK
PUNXSUTAWNEY MUNICIPAL
QUAKERTOWN
READING MUNICIPAL-
GENERAL CARL A. SPAATZ FIELD
READING REGIONAL-
CARL A. SPAATZ FIELD
ROSTRAVER
SCHUYULKILL COUNTY (JOE ZERBY)
SEAMANS FIELD
SEVEN SPRINGS
SOMERSET COUNTY
ST. MARYS MUNICIPAL
STROUDSBURG-POCONO
TITUSVILLE
UNIVERSITY PARK
WASHINGTON COUNTY
WESTMORELAND COUNTY
WILKES-BARRE/SCRANTON
INTERNATIONAL
WILLIAMSPORT-LYCOMING COUNTY
WINGS FIELD
YORK

The following is a list of Standard Instrument Departure (SID) charts available for the state of Pennsylvania. The SID's are updated on a 56-day cycle.

ALLEGHENY COUNTY
ALTOONA-BLAIR COUNTY

GREATER PITTSBURGH INTERNATIONAL
JOHNSTOWN-CAMBRIA COUNTY
NORTHEAST PHILADELPHIA
PHILADELPHIA INTERNATIONAL
WESTMORELAND COUNTY

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Pennsylvania. The STAR's are updated on a 56-day cycle.

CHESTER COUNTY-G.O. CARLSON
MERCER COUNTY
NORTHEAST PHILADELPHIA
PHILADELPHIA INTERNATIONAL
WARMINSTER NADC
WILLOW GROVE NAS

2. Current and Future Funding of C&GS Programs in Pennsylvania

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Strain Network (2 stations)	-	-	4.0	0.1
Aeronautical Charting	879.1	10.0	879.1	10.0
OC Program	63.0	0.9	105.0	1.5
Nautical Charting	7.5	0.1	10.0	0.2
TOTAL	949.6	11.0	998.1	11.8

3. Significant Past C&GS Involvement in Pennsylvania

Geodesy. Eight calibration base lines were established in the Commonwealth: Butler, Dalton, Harrisburg, Lock Haven, Nockamixon, Ogle, Sproul, and Titusville. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,554 kilometers (km) of releveling was accomplished in the State during the period FY 79-85. In FY 89, geodetic control surveys were performed at 45 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program. In FY 89, 74 horizontal and 40 vertical control marks were recovered in the Commonwealth.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, there were 3,896 horizontal control stations within the State evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. In FY 90, a new edition of Coast Pilots 6 and a new edition of four nautical charts were published for Pennsylvania's waters. These charts are:

Number	Chart Description
12312	WILMINGTON TO PHILADELPHIA
12313	PHILADELPHIA TO CAMDEN WATERFRONTS
14820	LAKE ERIE
14835	ERIE HARBOR

Aeronautical Charting. The following OC/ODS's were published in FY 90:

15	Allentown
187	Harrisburg
188	Middletown
320	Philadelphia (Int'l)
528	Philadelphia (Northeast)

4. Planned C&GS Initiatives in Pennsylvania During FY 92

Geodesy. A marketing plan is being developed in order to improve services to C&GS's 89 state affiliates of the NOAA/NOS automatic subscriber service in Pennsylvania. This also will improve services for ad hoc requestors from the Commonwealth.

A geodetic control survey is planned to be performed by GPS at stations in York and Franklin as part of the U.S. Eastern Strain Network.

Nautical Charting. The C&GS is planning to publish two new editions of nautical charts for FY 92. New editions of Coast Pilots 3 and 6 are published annually. The new chart editions are:

Number	Scale	Name
12312	40000	WILMINGTON TO PHILADELPHIA
12313	15000	PHILADELPHIA AND CAMDEN WATERFRONTS

Aeronautical Charting. Five OC's and five ODS's are to be published in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 85 authorized NOS chart agents can be improved during FY 92.

5. Specific Issues of Interest to the Commonwealth of Pennsylvania

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management's Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for North Dakota

1. Name and Status of C&GS' Programs for North Dakota During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 7,083 horizontal control points and 18,667 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of North Dakota. Visual chart coverage includes two Sectional Charts that are updated every six months and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 4 Low and High Altitude Enroute Charts and 42 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....0
Standard Terminal Arrival Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....10
  Category II ILS - special aircrew and aircraft
                  certification required 0
  Category III A ILS - special aircrew and aircraft
                  certification required 0
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....9
  Very High Frequency Omnidirectional Range (VOR).....18

Area Navigation (RNAV).....2
Localizer (LOC) and Localizer Backcourse (LOCBC).....3
Localizer Directional Aid (LDA).....0
Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....1
TOTAL 43

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of North Dakota. The IAP's are updated on a 56-day cycle.

BARNES COUNTY MUNICIPAL
BISMARK MUNICIPAL
BOWMAN MUNICIPAL
CASSELTON REGIONAL
DEVILS LAKE MUNICIPAL
DICKINSON MUNICIPAL
GRAND FORKS -
MARK ANDREWS INTERNATIONAL
HARRY STERN
HECTOR INTERNATIONAL
JAMESTOWN MUNICIPAL
MANDAN MUNICIPAL
MINOT INTERNATIONAL
MOHALL MUNICIPAL
PEMBINA MUNICIPAL
RUGBY MUNICIPAL
SLOULIN FIELD INTERNATIONAL

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

2. Current and Future Funding of C&GS Programs in North Dakota

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
OC Program	46.0	0.6	66.0	0.6
Aeronautical Charting	209.5	2.4	209.5	2.4
TOTAL	255.5	3.0	275.5	3.0

3. Significant Past C&GS Involvement in the State of North Dakota in Previous Years.

Geodesy. Three calibration base lines were established in the State: Bismarck, Dickinson, and Williston. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 2,190 kilometers (km) of releveling was accomplished in North Dakota during the period FY 81-90.

Twenty-five stations along the North Dakota part of the Canadian boundary were positioned with the Global Positioning System (GPS) in FY 88. Geodetic surveys were performed in support of the Federal Aviation Administration's Airport Datum Monumentation (ADAM) Program at two airports during FY 90.

In FY 89, 13 horizontal and 9 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,127 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

51 Bismark (OC/ODS)

4. Planned C&GS Initiatives in the State of North Dakota During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 63 state affiliates of the NOAA/NGSD

automatic subscriber service in North Dakota. This will also improve services for ad hoc requestors from the State.

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 18 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

Two OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of North Dakota

Geodesy. For 10 years the National Geodetic Survey (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for South Dakota

1. Name and Status of C&GS Programs for South Dakota During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 6,882 horizontal control points and 13,696 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System. Other areas in which state assistance will be explored are: updating and automating station descriptions; workshops on NAD 83 and Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information sytems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

In support of the NGRS, 390 kms of leveling will be performed.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of South Dakota. Visual chart coverage includes four Sectional Charts that are updated every six months and one World Aeronautical Chart that is updated annually. Instrument chart coverage includes 6 Low and High Altitude Enroute Charts and 41 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....0
Standard Terminal Arrival Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....8
  Category II ILS - special aircrew and aircraft
                certification required.....0
  Category III A ILS - special aircrew and aircraft
                certification required.....0
  Microwave Landing System (MLS).....0

Nonprecision Approach Procedure Charts:
- Nondirectional Radio Beacon (NDB).....10
- Very High Frequency Omnidirectional Range (VOR).....20
- Area Navigation (RNAV).....0
- Localizer (LOC) and Localizer Backcourse (LOCBC).....3
- Localizer Directional Aid (LDA).....0
- Simplified Directional Facility (SDF).....0

Visual Approach Procedures.....0
Airport Diagrams.....1
TOTAL 42

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of South Dakota. The IAP's are updated on a 56-day cycle.

ABERDEEN REGIONAL	JOE FOSS FIELD
BLACK HILLS-CLYDE ICE FIELD	MADISON MUNICIPAL
BOB WILEY FIELD	MILLER MUNICIPAL
BRITTON MUNICIPAL	MITCHELL MUNICIPAL
BROOKINGS MUNICIPAL	MOBRIDGE MUNICIPAL
CHAN GURNEY MUNICIPAL	PHILIP
ELLSWORTH AFB	PIERRE MUNICIPAL
HAROLD DAVIDSON FIELD	RAPID CITY REGIONAL
HURON REGIONAL	WATERTOWN MUNICIPAL

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Five OC/ODS's are planned for publication FY 91.

2. Current and Future Funding of C&GS Programs in South Dakota

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing	80.0	1 part-time	80.0	1 part-time
Geodetic Surveys:				
NGRS Leveling (1090km)	156.0	3.5	280.0	6.2
Strain Network (1 Station)	-	-	2.0	0.1
Aeronautical Charting	619.5	7.0	619.5	7.0
OC Program	115.0	1.5	66.0	0.6
TOTAL	970.5	12.5	1047.5	14.4

3. Significant Past C&GS Involvement in the State of South Dakota in Previous Years

Geodesy. Three calibration base lines were established in the State: Pierre, Rapid City, and Watertown. In support of the North American Vertical Datum (NAVD) readjustment project, a total of 1,164 kilometers (km) of releveling was accomplished in South Dakota during the period FY 85-90.

In FY 90, surveys were performed to monitor vertical movement at bridges along interstate highway 29. Geodetic control surveys were performed at two airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program. Also, two Calibration Base Lines at Pierre and Watertown were verified, and one station of the Strain Network was established in South Dakota.

In FY 89, 3 horizontal and 11 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,507 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. No OC/ODS's or SNS's were published in FY 90.

4. Planned C&GS Initiatives for the State of South Dakota During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 60 state affiliates of the NOAA/NGSD automatic subscriber service in South Dakota. This will also improve services for ad hoc requestors from the State.
One Station of the Strain Network will be measured in Pierre, South Dakota.

700 kms of leveling will be performed in support of the NGRS.

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 16 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

Two OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of South Dakota

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Iowa

1. Name and Status C&GS Programs for Iowa During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 5,277 horizontal control points and 7,245 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning Systems (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

No OC/ODS's and two SNS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Iowa. Visual chart coverage includes two Sectional Charts that are updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage

includes 4 Low and High Altitude Enroute Charts and 187 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....2
Standard Terminal Arrival Route Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....13
  Category II ILS - special aircrew and aircraft certification required.....0
  Category III A ILS - special aircrew and aircraft certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....81
  Very High Frequency Omnidirectional Range (VOR).....61
  Area Navigation (RNAV).....26
  Localizer (LOC) and Localizer Backcourse (LOCBC).....6
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....4
TOTAL 193

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Iowa. The IAP's are updated on a 56-day cycle.

ALBIA MUNICIPAL
ALGONA MUNICIPAL
AMES MUNICIPAL
ARTHUR N NEW
ATLANTIC MUNICIPAL
AUDUBON COUNTY
BLOOMFIELD MUNICIPAL
BOONE MUNICIPAL
BURLINGTON MUNICIPAL
CEDAR RAPIDS MUNICIPAL
CENTERVILLE MUNICIPAL
CHARITON MUNICIPAL
CHARLES CITY MUNICIPAL
CHEROKEE MUNICIPAL
CLARION MUNICIPAL
CLINTON MUNICIPAL
CORNING MUNICIPAL
COUNCIL BLUFFS MUNICIPAL
CRESTON MUNICIPAL
DAVENPORT MUNICIPAL
DECORAH MUNICIPAL
DENISON MUNICIPAL
DES MOINES INTERNATIONAL
DUBUQUE REGIONAL
EAGLE GROVE MUNICIPAL
ELLEN CHURCH FIELD
EMMETSBURG MUNICIPAL
ESTHERVILLE MUNICIPAL
FAIRFIELD MUNICIPAL
FOREST CITY MUNICIPAL
FORT DODGE MUNICIPAL
FORT DODGE REGIONAL
FORT MADISON MUNICIPAL
FORT MUNI REGIONAL
FULLER
GEORGE L. SCOTT MUNICIPAL
GREENFIELD MUNICIPAL
GRINNELL MUNICIPAL
HAMPTON MUNICIPAL
HARLAN MUNICIPAL

INDEPENDENCE MUNICIPAL
IOWA CITY MUNICIPAL
IOWA FALLS MUNICIPAL
JEFFERSON MUNICIPAL
KEOKUK MUNICIPAL
KNOXVILLE MUNICIPAL
LE MARS MUNICIPAL
MAPLETON MUNICIPAL
MAQUOKETA MUNICIPAL
MARSHALLTOWN MUNICIPAL
MASON CITY MUNICIPAL
MATHEWS MEMORIAL
MONTICELLO MUNICIPAL
MT. PLEASANT MUNICIPAL
MUSCATINE MUNICIPAL
NEWTON MUNICIPAL
OELWEIN MUNICIPAL
ORANGE CITY MUNICIPAL
OSKALOOSA MUNICIPAL
OTTUMWA INDUSTRIAL
PELLA MUNICIPAL
PERRY MUNICIPAL
POCAHONTAS MUNICIPAL
RED OAK MUNICIPAL
ROCK RAPIDS MUNICIPAL
SAC CITY MUNICIPAL
SCHENCK FIELD
SHELDON MUNICIPAL
SHENANDOAH MUNICIPAL
SIBLEY MUNICIPAL
SIOUX CENTER MUNICIPAL
SIOUX GATEWAY
SPENCER MUNICIPAL
SPIRIT LAKE
STORM LAKE MUNICIPAL
VINTON VETERANS MEMORIAL
WASHINGTON MUNICIPAL
WATERLOO MUNICIPAL
WAVERLY MUNICIPAL
WEBSTER CITY MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the State of Iowa. The SID's are updated on a 56-day cycle.

DES MOINES INTERNATIONAL
SIOUX GATEWAY

2. Current and Future Funding of C&GS Programs in the State of Iowa

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys:				
Strain Network Stations (1)	-	-	2.0	0.1
NGRS Leveling (550 km)	-	-	220.0	4.9
OC Program	12.0	0.2	92.0	1.2
Aeronautical Charting	817.2	9.3	817.2	9.3
TOTAL	829.2	9.5	1131.2	15.5

3. Significant Past C&GS Involvement in the State of Iowa in Previous Years.

Geodesy. Two Calibration Base Lines were established in the State: Ames and Pottawattamie. In support of the North America Vertical Datum (NAVD) readjustment project, a total of

470 kilomters (km) of releveling was accomplished in Iowa during FY 90. In FY 89, 25 horizontal and 42 vertical control points were recovered in the State. In FY 90, Geodetic control surveys were performed at 20 airports in the State in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,330 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

945 Waterloo (OC/ODS)
949 Davenport (OC/ODS)
972 Clinton (OC/ODS)
5307 Ames (OC/ODS)

4. Planned C&GS Initiatives in the State of Iowa During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 104 state affiliates of the NOAA/NGSD automatic subscriber service in Iowa. This will also improve services for ad hoc requestors from the state. One station for the Strain Network will be measured in Liberty, Iowa.

In support of the NGRS, 550 kms of leveling will be performed.

Aeronautical Charting. Four OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 35 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Iowa

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the

releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Nebraska

1. Name and Status of C&GS' Programs for Nebraska During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 7,510 horizontal control points and 12,691 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information sytsems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

In support of the NGRS, 170 kms of leveling will be performed.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Nebraska. Visual chart coverage includes two Sectional Charts that are updated every six months and three World Aeronautical Charts that are updated annually. Instrument chart coverage includes 7 Low and High Altitude Enroute Charts and 120 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Route Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....10
  Category II ILS - special aircrew and aircraft
                certification required.....1
  Category III A ILS - special aircrew and aircraft
                certification required.....0
  Microwave Landing System (MLS).....0

Nonprecision Approach Procedure Charts:
- Nondirectional Radio Beacon (NDB).....49
- Very High Frequency Omnidirectional Range (VOR).....53
- Area Navigation (RNAV).....8
- Localizer (LOC) and Localizer Backcourse (LOCBC).....4
- Localizer Directional Aid (LDA).....0
- Simplified Directional Facility (SDF).....0

Visual Approach Procedures.....0
Airport Diagrams.....2
TOTAL 128

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Nebraska. The IAP's are updated on a 56-day cycle.

AINSWORTH MUNICIPAL
ALBION MUNICIPAL
ALLIANCE MUNICIPAL
AURORA MUNICIPAL
BEATRICE MUNICIPAL
BRENNER FIELD
BREWSTER FIELD
BROKEN BOW MUNICIPAL
CAMBRIDGE MUNICIPAL
CENTRAL NEBRASKA REGIONAL
CHADRON MUNICIPAL
CHAPPELL MUNICIPAL
COLUMBUS MUNICIPAL
COZAD MUNICIPAL
CRAM FIELD
CRETE MUNICIPAL
EPPLEY AIRFIELD
EVELYN SHARP FIELD
FAIRBURY MUNICIPAL
FAIRMONT STATE AIRFIELD
FREMONT MUNICIPAL
GARDEN COUNTY
GORDON MUNICIPAL
GRANT MUNICIPAL
HASTINGS MUNICIPAL
HEBRON MUNICIPAL
IMPERIAL MUNICIPAL
KARL STEFAN MEMORIAL
KEARNEY MUNICIPAL
KIMBALL MUNICIPAL
LEE BIRD FIELD
LEXINGTON MUNICIPAL
LINCOLN MUNICIPAL
MCCOOK MUNICIPAL
MCCOOK STATE (ABANDONED)
MILLARD
MILLER FIELD
PIONEER VILLAGE FIELD
PLATTSMOUTH MUNICIPAL
QUINN FIELD
ROCK COUNTY
SEARLE FIELD
SEWARD MUNICIPAL
SIDNEY MUNICIPAL
SUPERIOR MUNICIPAL
TEKAMAH MUNICIPAL
THE O'NEILL MUNICIPAL-
JOHN L. BAKER FIELD
THOMAS COUNTY
WAHOO MUNICIPAL
WAYNE MUNICIPAL
WILLIAM B. HEILIG FIELD
YORK MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Nebraska. The SID's are updated on a 56-day cycle.

EPPLEY AIRFIELD

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's and 14 SNS's are planned for publication in FY 91.

2. Current and Future Funding of C&GS Programs in Nebraska

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time
OC Program	130.0	2.0	18.0	0.3
Aeronautical Charting	545.8	6.2	545.8	6.2
Geodetic Control Surveys:				
Eastern Strain Network (1)	-	-	2.0	0.1
NGRS Leveling (590 km)	68.0	1.5	168.0	7.6
TOTAL	823.8	10.2	813.8	14.7

3. Significant Past C&GS Involvement in the State of Nebraska in previous years.

Geodesy. Two calibration Base Lines were established in the State: Columbus and Kearney. During the period of FY 85 and FY 86, 550 km of releveling was performed in support of the NAVD program. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 808 kilometers (km) of releveling was accomplished in Nebraska during the period FY 85-89.

In FY 89, geodetic control surveys were performed at 37 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program.

In FY 89, two horizontal and no vertical control marks were recovered in the State of Nebraska.

In FY 90, one calibration baseline was measured at Columbus and one station for the Strain Network was measured in Nebraska. With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,822 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS' and SNS's were published in FY 90:

506 Chadron (OC/ODS)
5681 Ainsworth (SNS)
5809 Valentine (SNS)
5817 Burwell (SNS)
5830 Omaha (SNS)
6097 Aurora (SNS)

4. Planned C&GS Initiatives for the State of Nebraska During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 37 state affiliates of the NOAA/NGSD automatic subscriber service in Nebraska. This will also improve services for ad hoc requesters from the state. One station for the Eastern Strain Network will be measured in Lincoln, Nebraska.

In support of the NGRS, 420 kms of leveling will be performed.

Aeronautical Charting. A program is being developed to determine if the chart distribution services to subscribers, to catalog order customers, and to the 32 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92. One airport obstruction chart is scheduled to be published in FY 90.

5. Specific Issues of Interest to the State of Nebraska

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's Programs for Kansas

1. Name and Status of C&GS Programs for Kansas During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 9,963 horizontal control points and 12,870 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Three OC/ODS's and one SNS are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Kansas. Visual chart coverage includes two Sectional Charts and two Terminal Area Charts that are updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 7 Low and High Altitude Enroute Charts and 162 Instrument Approach Procedure Charts in one bound volume. Airport field surveys already have been completed during FY 87 for Goodland, Liberal, and Newton. Airport photo missions are scheduled for Hays (Hays Municipal), Salina (Salina Municipal), and Topeka (Philip Billard Municipal).

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....0
Standard Terminal Arrival Route Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....15
  Category II ILS - special aircrew and aircraft
                certification required.....1
  Category III A ILS - special aircrew and aircraft
                certification required.....0
  Microwave Landing System (MLS).....1
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....57
  Very High Frequency Omnidirectional Range (VOR).....57
  Area Navigation (RNAV).....24
  Localizer (LOC) and Localizer Backcourse (LOCBC).....7
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....4
TOTAL. 164

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Kansas. The IAP's are updated on a 56-day cycle.

ABILENE MUNICIPAL
ALLEN COUNTY
AMELIA EARHART
ANTHONY MUNICIPAL
ATKINSON MUNICIPAL
ATWOOD-RAWLINS COUNTY
AUGUSTA MUNICIPAL
BEECH FACTORY
BEECH NORTH
BELLEVILLE MUNICIPAL
BELOIT MUNICIPAL
BENTON
BLOSSER MUNICIPAL
CAPTAIN JACK THOMAS/
  EL DORADO
CESSNA AIRCRAFT FIELD
CHANUTE MARTIN JOHNSON
CHEYENNE COUNTY MUNICIPAL
CLAY CENTER MUNICIPAL
COFFEYVILLE MUNICIPAL
COLONEL JAMES JABARA
DODGE CITY REGIONAL

ELKHART-MORTON COUNTY
EMPORIA MUNICIPAL
EUREKA MUNICIPAL
FORBES FIELD
FORT SCOTT MUNICIPAL
FREEMAN FIELD
GARDEN CITY MUNICIPAL
GARDNER MUNICIPAL
GREAT BEND MUNICIPAL
HARPER MUNICIPAL
HAYS MUNICIPAL
HERINGTON MUNICIPAL
HUGOTON MUNICIPAL
HUTCHINSON MUNICIPAL
INDEPENDENCE MUNICIPAL
JOHNSON COUNTY INDUSTRIAL
LARNED-PAWNEE COUNTY
LAWRENCE MUNICIPAL
LIBERAL MUNICIPAL
LYONS-RICE COUNTY MUNICIPAL
MANHATTAN MUNICIPAL
MARSHALL AAF
MARYSVILLE MUNICIPAL
MCCONNELL AFB
MCPHERSON
MEADE MUNICIPAL
MINNEAPOLIS CITY COUNTY
NEODESHA MUNICIPAL
NEWTON-CITY-COUNTY
NORTON MUNICIPAL
OAKLEY MUNICIPAL
OBERLIN MUNICIPAL
OTTAWA MUNICIPAL
PHILIP BILLARD MUNICIPAL
PHILLIPSBURG MUNICIPAL
PRATT MUNICIPAL
RENNER FIELD
(GOODLAND MUNICIPAL)
RUSSELL MUNICIPAL
SALINA MUNICIPAL
SHALZ FIELD
SHERMAN AAF
SMITH CENTER MUNICIPAL
STANTON COUNTY MUNICIPAL
STROTHER FIELD
TRI-CITY
ULYSSES
WELLINGTON MUNICIPAL
WICHITA MID-CONTINENT

2. Current and Future Funding of C&GS Programs in the State of Kansas

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part time	80.0	1 part time
OC Program	63.0	0.9	84.0	1.2
Aeronautical Charting	722.8	8.2	722.8	8.2
OC Program	75.0	1.0	92.0	1.2
TOTAL	944.8	10.6	978.8	11.1

3. Significant Past C&GS Involvement in the State of Kansas in Previous Years

Geodesy. Two calibration base lines were established in the State: Olathe and Wichita. In support of the North America Vertical Datum (NAVD) readjustment project, a total of

1,331 kilometers (9 km) of releveling was accomplished in Kansas during the period FY 86-90.

NGSD performed geodetic control surveys at 20 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program and established 60 GPS points in Wyandotte Co. under a reimbursable cooperative agreement.

In FY 89, 32 horizontal and 35 vertical control marks were recovered in the State of Kansas.

In FY 90, the calibration baseline at Wichita was verified. With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 4,142 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

152	Fort Leavenworth (OC/ODS)
424	Topeka (OC/ODS)
5684	Parsons (OC/ODS)

4. Planned C&GS Initiatives in the State of Kansas During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 44 state affiliates of the NOAA/NGSD automatic subscriber service in Kansas. This will also improve services for ad hoc requesters from the state.

Aeronautical Charting. A program is being developed to determine if the chart distribution services to subscribers, to catalog order customers, and to the 50 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

Four OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of Kansas

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical

control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Missouri

1. Name and Status of C&GS' Programs for Missouri During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 8,878 horizontal control points and 13,964 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement with the State of Missouri, NGSD inspects control surveys performed and provides field training as needed.

GPS surveys involving 50 stations is planned in cooperation with USGS in the New Madrid Seismic Zone.

Geodetic surveys will be performed in support of Federal Aviation Administration's Airport Datum Monumentation (ADAM) programs at 30 airports in the State.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

One OC/ODS is planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Missouri. Visual chart coverage includes four Sectional Charts and two Terminal Area Charts that are updated every six months, and three World Aeronautical Charts that are upgraded annually. Instrument chart coverage includes 7 Low and High Altitude Enroute Charts and 191 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....4
Standard Terminal Arrival Route Charts (STAR's).....9
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....20
  Category II ILS - special aircrew and aircraft
                  certification required.....2
  Category III A ILS - special aircrew and aircraft
                  certification required.....1
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NRB).....54
  Very High Frequency Omnidirectional Range (VOR).....73
  Area Navigation (RNAV).....26
  Localizer (LOC) and Localizer Backcourse (LOCBC).....12
  Localizer Directional Aid (LDA).....2
  Simplified Directional Facility(SDF) 1
Visual Approach Procedures.....0
Airport Diagrams.....5
TOTAL 219

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Missouri. The IAP's are updated on a 56-day cycle.

AIR PARK SOUTH
ARROWHEAD
AURORA MEMORIAL MUNICIPAL
AVA BILL MARTIN MEMORIAL
BOWLING GREEN MUNICIPAL
BUTLER MEMORIAL
CABOOL MEMORIAL
CAMDENTON MEMORIAL
CAMERON MEMORIAL
CAPE GIRARDEAU MUNICIPAL
CASSVILLE MUNICIPAL
CHILLICOTHE MUNICIPAL
CLINTON MEMORIAL
COLUMBIA REGIONAL

COUNTY MEMORIAL
CREVE COEUR
CUBA MUNICIPAL
DEXTER MUNICIPAL
E. W. COTTON WOODS MEMORIAL
EAST KANSAS CITY
ELTON HENSLEY MEMORIAL
EXCELSIOR SPRINGS MEMORIAL
FARMINGTON REGIONAL
FESTUS MEMORIAL
FLOYD W. JONES LEBANON
FREDERICKTOWN MUNICIPAL
GENERAL JOHN J. PERSHING MEMORIAL
GIDEON MEMORIAL
HANNIBAL MUNICIPAL
HIGGINSVILLE - INDUSTRIAL MUNICIPAL
JEFFERSON CITY MEMORIAL
JESSE VIERTEL MEMORIAL
JOPLIN MUNICIPAL
JOPLIN REGIONAL
KANSAS CITY DOWNTOWN
KANSAS CITY INTERNATIONAL
KENNETT MEMORIAL
KIRKSVILLE MUNICIPAL
LAKE WINNEBAGO MUNICIPAL
LAMAR MUNICIPAL
LAMBERT-ST. LOUIS INTERNATIONAL
LEE C. FINE MEMORIAL
LEXINGTON MUNICIPAL
LINN CREEK-GRAND GLAIZE MEMORIAL
M. GRAHAM CLARK
MACON-FOWER MEMORIAL
MALDEN MUNICIPAL
MARSHALL MEMORIAL MUNICIPAL
MARYVILLE MEMORIAL
MCCOMAS-LEE'S SUMMIT MUNICIPAL
MEXICO MEMORIAL
MISSISSIPPI COUNTY
MONROE CITY REGIONAL
MOUNTAIN GROVE MEMORIAL
MOUNTAIN VIEW
NEOSHO MEMORIAL
NEVADA MUNICIPAL
OMAR N. BRADLEY
PERRYVILLE MUNICIPAL
POPLAR BLUFF MUNICIPAL
RICHARDS-GEBAUR
ROLLA DOWNTOWN
ROLLA NATIONAL
ROSECRANS MEMORIAL
SEDALIA MEMORIAL
SIKESTON MEMORIAL MUNICIPAL
SKYHAVEN
SPIRIT OF ST. LOUIS
SPRINGFIELD REGIONAL
ST. CHARLES COUNTY SMARTT
STOCKTON MUNICIPAL
TRENTON MUNICIPAL WASHINGTON MEMORIAL
WEISS
WENTZVILLE
WEST PLAINS MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Missouri. The SID's are updated on a 56-day cycle.

KANSAS CITY INTERNATIONAL
LAMBERT-ST. LOUIS INTERNATIONAL
SPIRIT OF ST. LOUIS

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Missouri. The STAR's are updated on a 56-day cycle.

JOHNSON COUNTY EXECUTIVE
JOHNSON COUNTY INDUSTRIAL
KANSAS CITY DOWNTOWN
KANSAS CITY INTERNATIONAL
LAMBERT-ST. LOUIS INTERNATIONAL
RICHARDS GEBAUR
SHERMAN AAF

2. Current and Future Funding of C&GS Programs in Missouri

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys:				
Strain Network Stations (1)	-	-	2.0	0.1
30 FAA Airports	255.0	5.7	-	-
GPS Survey (50 stations)	75.0	1.7		
NGRS leveling (120 km)	-	-	48.0	1.1
OC Program	23.0	0.3	0.0	0.0
Aeronautical Charting	935.2	10.6	935.2	10.6
TOTAL	1288.2	18.3	985.2	11.8

3. Significant Past C&GS Involvement in the State of Missouri in Previous Years

Geodesy. One Calibration Base Line was established in the State: Vichy. In recent years, primary horizontal control was established along 90 miles of the Mississippi River from Cairo, Illinois, to Missouri-Arkansas state border for the Corps of Engineers, Memphis District; and on the Ozark Plateau.

In support of the North America Vertical Datum (NAVD) readjustment project, a total of 909 kilometers (km) of releveling was accomplished in Missouri during the period FY 86-90. In FY 90, geodetic surveys were performed in support of the Federal Aviation Administration's Airport Datum Monumentation (ADAM) program at 30 airports. One Strain Network Station was established in the State.

In FY 89, 22 horizontal and 107 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,450 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

217 Kirksville (OC/ODS)
604 Springfield (OC/ODS)

4. Planned C&GS Initiatives for the State of Missouri During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 56 state affiliates of the NOAA/NGSD automatic subscriber service in Missouri. This will also improve services for ad hoc requesters from the State. One station on the Strain Network will be measured in Poplar Bluff, Missouri.

In support of the NGRS, 120 kms of leveling will be performed.

Aeronautical Charting. Three OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution services to subscribers, to catalog order customers, and to the 56 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Missouri

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the Amercian Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Oklahoma

1. Name and Status of C&GS' Programs for Oklahoma During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 6,856 horizontal control points and 8,539 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement with the U.S. Army, Fort Sill, Oklahoma, a full-time resident advisor serves as NOAA Liaison Officer and assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Oklahoma. Visual chart coverage includes four Sectional Charts that are updated every six months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 5 Low and High Altitude Enroute Charts and 126 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....2
Standard Terminal Arrival Route Charts (STAR's).....2
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....12
  Category II ILS - special aircrew and aircraft
                certification required.....2
  Category III A ILS - special aircrew and aircraft
                certification required.....0
  Microwave Landing System (MLS).....0

Nonprecision Approach Procedure Charts:
- Nondirectional Radio Beacon (NDB).....46
- Very High Frequency Omnidirectional Range (VOR).....42
- Area Navigation (RNAV).....16
- Localizer (LOC) and Localizer Backcourse (LOCBC).....8
- Localizer Directional Aid (LDA).....0
- Simplified Directional Facility (SDF).....0

Visual Approach Procedures.....0
Airport Diagrams.....4
TOTAL 134

The following is list of Instrument Approach Procedure (IAP) charts available for the state of Oklahoma. The IAP's are updated on a 56-day cycle.

ADA MUNICIPAL
ALTUS MUNICIPAL
ALVA MUNICIPAL
ANTLERS MUNICIPAL
ARDMORE DOWNTOWN EXECUTIVE
ARDMORE MUNICIPAL
BLACKWELL-TONKAWA MUNICIPAL
BOISE CITY
BUFFALO MUNICIPAL
CHANDLER MUNICIPAL
CHICKASHA MUNICIPAL
CLARENCE E. PAGE MUNICIPAL
CLINTON MUNICIPAL
CLINTON-SHERMAN
CUSHING MUNICIPAL
DAVID JAY PERRY
DAVIS FIELD
EAKER FIELD
EL RENO MUNICIPAL AIRPARK
ELK CITY MUNICIPAL
ENID WOODRING MUNICIPAL
FAIRVIEW MUNICIPAL
FRANK PHILLIPS
FREDERICK MUNICIPAL
GAGE-SHATTUCK
GROVE MUNICIPAL
GUTHRIE MUNICIPAL
GUYMON MUNICIPAL
HALLIBURTON FIELD
HENRYETTA MUNICIPAL
HOBART MUNICIPAL
HOLDENVILLE MUNICIPAL
IDABEL
JONES MEMORIAL
LAWTON MUNICIPAL
MADILL MUNICIPAL
MCALESTER REGIONAL
MEDFORD MUNICIPAL
MIAMI MUNICIPAL
MID-AMERICA INDUSTRIAL
MOORELAND MUNICIPAL
OKMULGEE MUNICIPAL
PAULS VALLEY MUNICIPAL
PERRY MUNICIPAL
PONCA CITY MUNICIPAL
PRAGUE MUNICIPAL
RICHARD LLOYD JONES JR.
ROBERT S. KERR
SEMINOLE MUNICIPAL
SHANGRI-LA
SHAWNEE MUNICIPAL
STILL WATER MUNICIPAL
SUNDANCE AIRPARK
TAHLEQUAH MUNICIPAL
THOMAS P. STAFFORD
TIPTON MUNICIPAL
TULSA INTERNATIONAL
UNIVERSITY OF OKLAHOMA
WESTHEIMER AIRPARK
WATONGA
WEST WOODWARD
WILEY POST
WILL ROGERS WORLD
WILLIAM R. POGUE MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Oklahoma. The SID's are updated on a 56-day cycle.

RICHARD LLOYD JONES JR	TULSA INTERNATIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Oklahoma. The STAR's are updated on a 56-day cycle.

CLARENCE E. PAGE MUNICIPAL	TULSA INTERNATIONAL
DAVID JAY PERRY	UNIVERSITY OF OKLAHOMA
RICHARD LLOYD JONES JR.	WESTHEIMER AIRPARK
SUNDANCE AIRPARK	WILEY POST
TINKER AFB	WILL ROGERS WORLD

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

No OC/ODS's or SNS's are planned for publication in FY 91.

2. Current and Future Funding of C&GS Programs in Oklahoma

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Geodetic Control Surveys:				
Strain Network Stations (1)	-	-	2.0	0.1
Aeronautical Charting	607.7	6.9	607.7	6.9

OC Program	0.0	0.0	-	-
TOTAL	607.7	6.9	609.9	7.0

3. Significant Past C&GS Involvement in the State of Oklahoma in Previous Years

Geodesy. Two calibration base lines were established in the State: Tulsa and Fort Sill. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,074 kilometers (km) of releveling was accomplished in Oklahoma during the period FY 85-89. In FY 88, 23 GPS points were occupied at Fort Sill.

In FY 89, geodetic control surveys were performed at 42 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program. Also, one calibration base line (CBL) was established at Fort Sill. In FY 90 the CBL at Tulsa was verified.

In FY 89, 18 horizontal and 545 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,768 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. No OC/ODS's or SNS's were published in FY 90.

4. Planned C&GS Initiatives in the State of Oklahoma During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 46 state affiliates of the NOAA/NGSD automatic subscriber service in Oklahoma. This will also improve services for ad hoc requesters from the state.

In FY 92, one Strain Network station will be measured in Leonard, Oklahoma.

Aeronautical Charting. A program is being developed to determine if the chart distribution services to subscribers, to catalog

order customers, and to the 46 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

No OC/ODS's or SNS's are planned for publication in FY 92.

5. Specific Issues of Interest to the State of Oklahoma

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for the State of Tennessee

1. Name and Status of C&GS Programs for Tennessee During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 5,756 horizontal control points and 17,669 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS)s; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

One OC/ODS is planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Tennessee. Visual chart coverage includes four Sectional Charts and one Terminal Area Chart that are updated every six months, and two World Aeronautical Charts that are updated

annually. Instrument chart coverage includes 6 Low and High Altitude Enroute Charts and 141 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....4
Standard Terminal Arrival Route Charts (STAR's).....8
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....23
  Category II ILS - special aircrew and aircraft
                certification required.....5
  Category III A ILS - special aircrew and aircraft
                certification required.....0
  Microwave Landing System (MLS).....0
  Category III A ILS - special aircrew and aircraft
                certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....51
  Very High Frequency Omnidirectional Range (VOR).....42
  Area Navigation (RNAV).....5
  Localizer (LOC) and Localizer Backcourse (LOCBC).....5
  Localizer Directional Aid (LDA).....1
  Simplified Directional Facility (SDF).....9
Visual Approach Procedures.....0
Airport Diagrams.....4
TOTAL 157

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Tennessee. The IAP's are updated on a 56-day cycle.

ABERNATHY FIELD
ARLINGTON MUNICIPAL
BENTON COUNTY
BOLIVAR-HARDEMAN COUNTY
BOMAR FIELD-SHELBYVILLE MUNICIPAL
BRISTOL/TRI-CITY REGIONAL
CAMPBELL COUNTY
CAMPBELL AAF
CARROLL COUNTY
CENTERVILLE MUNICIPAL
COVINGTON MUNICIPAL
CROSSVILLE MEMORIAL
DICKSON MUNICIPAL
DYERSBURG MUNICIPAL
ELLINGTON
EVERETT-STEWART
FAYETTEVILLE MUNICIPAL
FRANKLIN WILKINS
GATLINBURG-PIGEON FORGE
GIBSON COUNTY
GREENEVILLE MUNICIPAL
HARDWICK FIELD
HAWKINS COUNTY
HENRY COUNTY
HUMBOLDT MUNICIPAL
HUMPHREYS COUNTY
JAMESTOWN MUNICIPAL
JOHN C. TUNE
KNOXVILLE DOWNTOWN ISLAND
LAFAYETTE MUNICIPAL
LAWRENCEBURG MUNICIPAL

LEBANON MUNICIPAL
LIVINGSTON MUNICIPAL
LOVELL FIELD
MARION COUNTY-BROWN FIELD
MARK ANTON
MAURY COUNTY
MCGHEE-TYSON
MCKELLAR-SIPES REGIONAL
MCMINN COUNTY
MEMPHIS INTERNATIONAL
MONROE COUNTY
MOORE-MURRELL
MURFREESBORO MUNICIPAL
NASHVILLE INTERNATIONAL
OUTLAW FIELD
PORTLAND MUNICIPAL
PUTNAM COUNTY
ROBERT SIBLEY
ROCKWOOD MUNICIPAL
SAVANNAH-HARDIN COUNTY
SCOTT MUNICIPAL
SMITHVILLE MUNICIPAL
SMYRNA
SPARTA-WHITE COUNTY
SPRINGFIELD MUNICIPAL
SUMNER COUNTY REGIONAL
TRI-CITY REGIONAL
TULLAHOMA REGIONAL AIRPORT-WILLIAM NORTHERN FIELD
WARREN COUNTY MEMORIAL
WINCHESTER MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Tennessee. The SID's are updated on a 56-day cycle.

LOVELL FIELD
MCGHEE-TYSON
MEMPHIS INTERNATIONAL
NASHVILLE INTERNATIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Tennessee. The STAR's are updated on a 56-day cycle.

MEMPHIS INTERNATIONAL
MURFREESBORO MUNICIPAL
NASHVILLE INTERNATIONAL
OLIVE BRANCH
SMYRNA
WEST MEMPHIS MUNICIPAL

2. Current and Future Funding of C&GS Programs in the State of Tennessee

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys:				
Strain Network Stations (3)	-	-	6.0	0.1
OC Program	21.0	0.3	84.0	1.2
Aeronautical Charting	678.5	7.7	678.5	7.7
TOTAL	699.5	8.0	768.5	9.0

3. Significant Past C&GS Involvement in the State of Tennessee in previous years.

Geodesy. Four Calibration Base Lines were established in the State: Cookeville, Johnson City, Memphis, and Tullahoma. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 733 kilometers (km) of releveling was accomplished in Tennessee during the period FY 83-84.

In FY 87, NGSD entered into a cooperative agreement with the Tennessee Department of Transportation to assist (reconnaissance and technical guidance) the State in establishing a network of geodetic control points at Federal Aviation Administration airports and other selected sites throughout the State.

The Johnson City calibration baseline was remeasured in FY 87.

In FY 89, 15 horizontal and 24 vertical control marks were recovered in the State.

In FY 90, three Strain Network Stations were established in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjusted in July 1986, 2,671 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. No OC/ODS's or SNS's were published in FY 90.

4. Planned C&GS Initiatives in the State of Tennessee During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 41 state affiliates of the NOAA/NGSD automatic subscriber service in Tennessee. This will also improve services for ad hoc requestors from the state.

In FY 92, three Strain Network Stations will be measured in Covington, Pikesville, and Selmer.

Aeronautical Charting. Four OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers,

and to the 46 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Tennessee

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lies to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

High precision statewide Global Positioning System (GPS) networks meeting high accuracy standards are being established in response to individual state requests, throughout the United States to support surveying and mapping activities with those states. The Statewide High Accuracy GPS network covering the State of Tennessee contains 60 stations. Station spacing is approximately 45 kilometers. Three US Eastern Strain Network stations are included in the network and provide reference of the network to the National Crustal Motion Network (NCMN). Leveling to 50 of the 60 stations has been completed. This network was established as a cooperative activity between the Tennessee Department of Transportation (TDOT) and the National Geodetic Survey Division (NGSD). Mr. James Zeigler, TDOT, coordinated the State's effort in establishing the network. Field observations were performed by Aero Service under contract to TDOT during October - November 1987. Further data reduction and analysis are presently in progress using simultaneous orbit and network adjustment techniques.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for West Virginia

1. Name and Status of C&GS Programs for West Virginia During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 2,876 horizontal control points and 12,983 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS)s; utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State. Visual chart coverage includes three Sectional Charts and

two Terminal Area Charts that are updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 6 Low and High Altitude Enroute Charts and 45 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....12
  Category II ILS - special aircrew and aircraft
    certification required.....0
  Category III A ILS - special aircrew and aircraft
    certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....6
  Very High Frequency Omnidirectional Range (VOR).....21
  Area Navigation (RNAV).....3
  Localizer (LOC) and Localizer Backcourse (LOCBC).....1
  Localizer Directional Aid (LDA).....1
  Simplified Directional Facility (SDF).....1
Visual Approach Procedures.....0
Airport Diagrams.....1
TOTAL 47

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of West Virginia. The IAP's are updated on a 56-day cycle.

BENEDUM
EASTERN WV REGIONAL AIRPORT-
  SHEPHERD FIELD
ELKINS-RANDOLPH COUNTY-
  JENNINGS RANDOLPH FIELD
FAIRMONT MUNICIPAL
GRANT COUNTY
GREENBRIER VALLEY
JACKSON COUNTY
KEE FIELD
MARSHALL COUNTY
MASON COUNTY
MERCER COUNTY
MORGANTOWN MUNICIPAL -
  WALTER L. BILL HART FIELD
POTOMAC AIRPARK
RALEIGH COUNTY MEMORIAL
SUMMERSVILLE
TRI-STATE/WALKER-LONG FIELD
WHEELING-OHIO COUNTY
WOOD COUNTY -
  GILL ROBB WILSON FIELD
YEAGER

The following is a list of Standard Instrument Departure (SID) charts available for the state of West Virginia. The SID's are updated on a 56-day cycle.

MERCER COUNTY

2. Current and Future Funding of C&GS Programs in the State of West Virginia

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys:				
Strain Network Stations (1)	-	-	2.0	0.1
OC Program	42.0	0.6	63.0	0.9
Aeronautical Charting	253.7	2.9	253.7	2.9
TOTAL	295.7	3.5	318.7	3.9

3. Significant Past C&GS Involvement in the State of West Virginia in Previous Years

Geodesy. One calibration base line was established in the State: Marshall County. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,134 kilometers (km) of releveling was accomplished in West Virginia during the period FY 79-86. In FY 90, one Strain Network Station was established in the state.

Geodetic Surveys were performed in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program at the following eight airports in FY 88:

BERKELEY SPRINGS	PINEVILLE
ELKINS	POINT PLEASANT
FAIRMONT	RAVENSWOOD
PETERSBURG	SUMMERSVILLE

In FY 89, 9 horizontal and 45 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 1,087 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper

NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

249 Martinsburg
852 Charleston

4. Planned C&GS Initiatives in the State of West Virginia During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 25 state affiliates of the NOAA/NGSD automatic subscriber service in West Virginia. This will also improve services for ad hoc requestors from the state.

In FY 92, one Strain Network Station will be measured in Green Bank, West Virginia.

Aeronautical Charting. Three OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 14 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of West Virginia

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An import- ant feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.
See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Kentucky

1. Name and Status of C&GS' Programs for Kentucky During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 6,264 horizontal control points and 18,218 vertical control points in the Commonwealth.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the Commonwealth of Kentucky. Visual chart coverage includes two Sectional Charts that are updated every six months, and

two World Aeronautical Charts that are updated annually. Instrument chart coverage includes 4 Low and High Altitude Enroute Charts and 85 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....3
Standard Terminal Arrival Charts (STAR's).....1
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....14
  Category II ILS - special aircrew and aircraft
    certification required.....2
  Category III A ILS - special aircrew and aircraft
    certification required.....1
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....21
  Very High Frequency Omnidirectional Range (VOR).....37
  Area Navigation (RNAV).....5
  Localizer (LOC) and Localizer Backcourse (LOCBC).....1
    Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....4
Visual Approach Procedures.....0
Airport Diagrams.....4
TOTAL 93

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Kentucky. The IAP's are updated on a 56-day cycle.

ADDINGTON FIELD
ASHLAND-BOYD COUNTY
BARKLEY REGIONAL
BLUE GRASS
BOWLING GREEN-WARREN COUNTY
BOWMAN FIELD
CAMPBELL AAF
CAPITAL CITY
FARRINGTON AIRPARK
FLEMING-MASON
GENE SNYDER
GLASGOW MUNICIPAL
GOODALL FIELD
GREATER CINCINNATI INTERNATIONAL
HANCOCK AIRFIELD
HENDERSON CITY-COUNTY
HOPKINSVILLE-CHRISTIAN COUNTY
JULIAN CARROLL
KYLE-OAKLEY FIELD
LEBANON-SPRINGFIELD
LONDON-CORBIN AIRPORT-MAGEE FIELD
MADISON
MADISONVILLE MUNICIPAL
MAYFIELD GRAVES COUNTY
ST. STERLING-MONTGOMERY COUNTY
MUHLENBERG COUNTY
OWENSBORO-DAVIES COUNTY
RUSSELLVILLE-LOGAN COUNTY
SAMUELS FIELD

SOMERSET-PULASKI COUNTY-
J. T. WILSON FIELD
STANDIFORD FIELD

STURGIS MUNICIPAL
TAYLOR COUNTY
WAYNE COUNTY

The following is a list of Standard Instrument Departure (SID) charts available for the state of Kentucky. The SID's are updated on a 56-day cycle.

GREATER CINCINNATI INTERNATIONAL

STANDIFORD FIELD

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Kentucky. The STAR's are updated on a 56-day cycle.

GREATER CINCINNATI INTERNATIONAL

2. Current and Future Funding of C&GS Programs in Kentucky

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys:				
Strain Network Stations (1)	-	-	2.0	0.1
NGRS Leveling (120 km)	-	-	48.0	1.1
OC Program	42.0	0.6	42.0	0.6
Aeronautical Charting	395.3	5.5	393.3	5.5
TOTAL	437.3	6.1	485.3	7.3

3. Significant Past C&GS Involvement in the Commonwealth of Kentucky in previous years

Geodesy. Two Calibration Base Lines were established in the Commonwealth: Lexington and Louisville. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 494 kilometers (km) of releveling was accomplished in Kentucky during the period FY 84-87.

In FY 89, 43 horizontal and 89 vertical control marks were recovered in the Commonwealth of Kentucky. In FY 89, NGSD performed geodetic control surveys at 21 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program.

In FY 90, one Strain Network Station was established in Kentucky.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,433 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS's were published in FY 90:

239 Louisville (OC/ODS)
628 Paducah (OC/ODS)

4. Planned C&GS Initiatives for the State of Kentucky During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 50 affiliates of the NOAA/NGSD automatic subscriber service in Kentucky. This will also improve services for ad hoc requesters from the Commonwealth.

In support of the NGRS, 120 kms of leveling will be performed.

In FY 92, one Strain Network Station was measured in Stanton, Kentucky.

Aeronautical Charting. Two airport obstruction charts are scheduled to be published in FY 92.

A program is being developed to determine if the chart distribution services to subscribers, to catalog order customers, and to the 23 authorized National Ocean Service (NOS) chart agents in the commonwealth can be improved during FY 92.

5. Specific Issues of Interest to the Commonwealth of Kentucky

Geodesy. For 10 years the National Geodetic Survey Division (NGSD)has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Program for Arkansas

1. Name and Status of C&GS' Programs for Arkansas During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 6,844 horizontal control points and 19,124 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Three OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Arkansas. Visual chart coverage includes three Sectional Charts that are updated every 6 months, and one World Aeronautical Chart that is updated annually. Instrument chart

coverage includes 7 Low and High Altitude Enroute Charts and 101 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Route Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....7
  Category II ILS - special aircrew and aircraft
                certification required.....0
  Category III A ILS - special aircrew and aircraft
                certification required.....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....36
  Very High Frequency Omnidirectional Range (VOR).....47
  Area Navigation (RNAV).....4
  Localizer (LOC) and Localizer Backcourse (LOCBC).....6
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF) 1
Visual Approach Procedures.....0
Airport Diagrams.....2
TOTAL 104

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Arkansas. The IAP's are updated on a 56-day cycle.

ADAMS FIELD
ALMYRA MUNICIPAL
ARKADELPHIA MUNICIPAL
BATESVILLE REGIONAL
BAXTER COUNTY REGIONAL
BENTONVILLE MUNICIPAL
BILLY FREE MUNICIPAL
BLYTHEVILLE MUNICIPAL
BOONE COUNTY
CARLISLE MUNICIPAL
CLARKSVILLE MUNICIPAL
CORNING MUNICIPAL
CROSSETT MUNICIPAL
CRYSTAL LAKE
DENNIS F. CANTRELL FIELD
DRAKE FIELD
FOREST CITY MUNICIPAL
FORT SMITH MUNICIPAL
FRANK FEDERER MEMORIAL
GOODWIN FIELD
GRIDER FIELD
HARRELL FIELD
HARRY E. WILCOX MEMORIAL
HEBER SPRINGS MUNICIPAL
HOPE MUNICIPAL
INTERMOUNTAIN REGIONAL
J. LYNN HELMS-SEVIER COUNTY
JONESBORO MUNICIPAL
KIRK FIELD
LAKE VILLAGE MUNICIPAL
MAGNOLIA MUNICIPAL
MALVERN MUNICIPAL
MARION COUNTY REGIONAL
MCGEHEE MUNICIPAL
MEMORIAL FIELD
MONTICELLO MUNICIPAL
MORRILTON MUNICIPAL
NEWPORT MUNICIPAL
NORTH LITTLE ROCK MUNICIPAL
OZARK-FRANKLIN COUNTY
PETIT JEAN PARK
POCAHONTAS MUNICIPAL

ROGERS MUNICIPAL-
CARTER FIELD
RUSSELLVILLE MUNICIPAL
SALINE COUNTY
SEARCY MUNICIPAL
SMITH FIELD
SPRINGDALE MUNICIPAL
STUTTGART MUNICIPAL
TAXARKANA REGIONAL-
WEBB FIELD
THOMPSON-ROBBINS FIELD
WALNUT RIDGE REGIONAL
WARREN MUNICIPAL
WEST MEMPHIS MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the State of Arkansas. The SID's are updated on a 56-day cycle.

ADAMS FIELD

2. Current and Future Funding of C&GS Programs in the State of Arkansas

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys: Strain Network Stations (1)	-	-	2.0	0.1
OC Program	63.0	0.9	63.0	0.9
Aeronautical Charting	463.2	5.3	463.2	5.3
TOTAL	526.2	6.2	528.2	6.3

3. Significant Past C&GS Involvement in the State of Arkansas in Previous Years.

Geodesy. Four Calibration Base Lines were established in the State: Jonesboro, Little Rock, Springdale, and Russellville. In 1977, horizontal control was established along 20 miles of the Mississippi River from the northeast Arkansas state border to Osceola for the U.S. Army Corps of Engineers (COE) Memphis District. In 1976, there were 1,100 kilometers (km) of vertical control surveys performed for the COE, Memphis District. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 500 kilometers (km) of releveling was accomplished in Arkansas during the period FY 90. In FY 85, GPS for 25 stations and vertical surveys of 130 km was performed for the COE, Memphis District, from Helena along the west levee to White River, Arkansas.

In FY 89, 86 horizontal and 90 vertical control points were recovered in the State.

In FY 90, geodetic control was established at 41 Federal Aviation Administration (FAA) airports in the State in support of the FAA's Airport Datum Monumentation program and through cooperative agreement with University of Arkansas. Also, one Strain Network Station was established in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,644 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

233	Little Rock (OC/ODS)
5135	Harrison (OC/ODS)
5165	Springdale (OC/ODS)
5386	West Memphis (OC/ODS)

4. Planned C&GS Initiatives in the State of Arkansas During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 23 state affiliates of the NOAA/NGSD automatic subscriber service in Arkansas. This will also improve services for ad hoc requesters from the state.

In FY 92, one Strain Network Station will be established in Brinkley, Arkansas.

Aeronautical Charting. Three airport obstruction charts are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution services to subscribers, to catalog order customers, and to the 28 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Arkansas

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the

releveling of 81,500 Km of primary leveling liens to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Idaho

1. Name and Status of C&GS Programs for Idaho During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 8,805 horizontal control points and 19,292 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging State agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

In FY 91, geodetic control surveys will be performed at two airports in support of the Federal Aviation Administration's Airport Datum Monumentation program.

Nautical Charting. Charts 18554, Lake Pend Oreille (scale 50,000) and 18548 SC, Snake River and Lower Granite Lake (scale 20,000) are on issue in the State of Idaho. A topographic/ bathymetric map and a new edition of nautical chart 18548 SC will be printed in FY 91.

There is one Nautical Chart Sales Agent in the State of Idaho. Agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc., located in other parts of the State.

Nautical Publications. A new edition of Coast Pilot 7 is published annually.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Idaho. Visual chart coverage includes two Sectional Charts that are updated every 6 months, and two World Aeronautical Chart that are updated annually.

Instrument chart coverage includes 2 Low and High Altitude Enroute Charts and 36 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....3
Standard Terminal Arrival Route Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....6
  Category II ILS - special aircrew and aircraft
    certification required.....0
  Category III A ILS - special aircrew and aircraft
    certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....10
  Very High Frequency Omni-directional Range (VOR).....17
  Area Navigation (RNAV).....1
  Localizer (LOC) and Localizer Backcourse (LOCBC).....2
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....2
TOTAL 41

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Idaho. The IAP's are updated on a 56-day cycle.

BOISE AIR TERMINAL
  (GOWEN FIELD)
BURLEY MUNICIPAL
CALDWELL INDUSTRIAL
COEUR D'ALENE AIR TERMINAL
FANNING FIELD
FRIEDMAN MEMORIAL
GOODING MUNICIPAL
JEROME COUNTY
LEWISTON-NEZ PERCE COUNTY
MCCALL
MOUNTAIN HOME MUNICIPAL
NAMPA MUNICIPAL
POCATELLO MUNICIPAL
REXBURG-MADISON COUNTY
TWIN FALLS -
  SUN VALLEY REGIONAL -
  JOSLIN FIELD

The following is a list of Standard Instrument Departure (SID) charts available for the State of Idaho. The SID's are updated on 56-day cycle.

BOISE AIR TERMINAL
  (GOWEN FIELD)
LEWISTON-NEZ PERCE COUNTY

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

One OC/ODS is planned for publication in FY 91.

2. Current and Future Funding of C&GS Programs in the State of Idaho

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part time	80.0	1 part time
Nautical Charting	16.5	0.3	-	-
Geodetic Control Surveys: 2 FAA Airports	17.0	0.4	-	-
OC Program	21.0	0.3	42.0	0.6
Aeronautical Charting	209.5	2.4	209.5	2.4
TOTAL	344.0	3.9	331.5	3.5

3. Significant Past C&GS Involvement in Idaho in previous years

Geodesy. Four Calibration Base Lines were established in the State: Athol, Boise, Idaho Falls, and Moscow. During 1978-1979, a combined geodetic, high-precision photogrammetric horizontal

control survey was done as a cooperative effort between the NGSD and the Nautical Charting Division of C&GS and Ada County, Idaho. In support of the North American Vertical Datum (NAVD) readjustment project, a total of 2,254 km of releveling was accomplished in Idaho in FY 80-85. Geodetic Control Surveys were performed by Global Positioning System (GPS) at 61 stations in accordance with cooperative agreements with the Idaho Engineering Laboratory and the Idaho Department of Transportation.

In FY 89, two horizontal and 265 vertical control points were recovered in the state.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,696 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. No new editions of nautical charts were issued for Idaho's waters during FY 88.

Nautical Publications. A new edition of Coast Pilot 7 is published annually.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

327 Pocatello (OC/ODS)
527 Coeur D'Alene (OC/ODS)

4. Planned C&GS Initiatives in the State of Idaho During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 37 state affiliates of the NOAA/NGSD automatic subscriber service in Idaho. This will also improve services for ad hoc requestors from the state.

Aeronautical Charting. Two OC/ODS's are tentatively planned for publicatiuon in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 22 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

Nautical Charting. No new editions of nautical charts for Idaho's waters are planned for FY 91 or FY 92.

Nautical Publications. A new edition of Coast Pilot 7 is published annually.

5. Specific Issues of Interest to the State of Idaho

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Montana

1. Name and Status of C&GS' Programs for Montana During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 7,264 horizontal control points and 27,765 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic Survey operations and procedures.

In FY 91, NGSD will perform geodetic control surveys at three airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program. A GPS Survey involving 30 stations will be performed in accordance with state cooperative agreement.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Montana. Visual chart coverage includes two Sectional Charts that are updated every 6 months, and two World Aeronautical Chart that is updated annually. Instrument chart coverage includes 2 Low and High Altitude Enroute Charts and 55 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....4
Standard Terminal Arrival Route Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....9
  Category II ILS - special aircrew and aircraft
                  certification required.....0
  Category III A ILS - special aircrew and aircraft
                  certification required.....0
   Microwave Landing System(MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....17
  Very High Frequency Omni-directional Range (VOR).....27
  Area Navigation (RNAV).....0
  Localizer (LOC) and Localizer Backcourse (LOCBC).....2
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....3
TOTAL 62

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Montana. The IAP's are updated on a 56-day cycle.

BERT MOONEY
BILLINGS LOGAN INTERNATIONAL
CHOTEAU
CONRAD
CUT BANK MUNICIPAL
DAWSON COMMUNITY
DILLON
FRANK WILEY FIELD
GALLATIN FIELD
GLACIER PARK INTERNATIONAL
GLASGOW INTERNATIONAL
GREAT FALLS INTERNATIONAL
HAVRE CITY-COUNTY
HELENA REGIONAL
LAUREL MUNICIPAL
LEWISTOWN MUNICIPAL

MISSION FIELD
MISSOULA INTERNATIONAL
SHELBY
SIDNEY-RICHLAND MUNICIPAL
TILLITT FIELD
WOLF POINT INTERNATIONAL
YELLOWSTONE

The following is a list of Standard Instrument Departure (SID) charts available for the state of Montana. The SID's are updated on a 56-day cycle.

HELENA REGIONAL

2. Current and Future Funding of C&GS Programs in Montana

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 cost sharing)	80.0	1 part-time	80.0	1 part-time
Geodetic Control Surveys:				
3 FAA Airports	25.5	0.6	-	-
30 GPS Stations	45.0	1.0	-	-
Strain Network (1 station)	-	-	2.0	0.1
Aeronautical Charting	286.2	3.3	286.2	3.3
OC Program	42.0	0.6	63.0	0.9
TOTAL	478.7	6.0	431.2	4.8

3. Significant Past C&GS Involvement in the State of Montana for FY in Previous Years

Geodesy. Thirteen Calibration Base Lines were established in the State: Belgrade, Butte, Great Falls, Havre, Helena, LaSalle, Laurel, Lewistown, Libby, Lindsay, Miles City, Missoula, and Nashua. In FY 86, a GPS survey was performed in the Kootenai National Forest for the U.S. Forest Service (25 stations). A GPS survey was performed at Miles City as part of the U.S. Eastern Strain Network.

In support of the North America Vertical Datum (NAVD) readjustment project, a total of 4,783 kilometers (km) of releveling was accomplished in Montana during the period FY 81-90.

In FY 88, the International Boundary Commission (IBC) - U.S. Section Coop Reimbursable Agreement - 45 stations.

Sixty stations along the Montana part of the US/Canadian Boundary were positioned by the Global Positioning System (GPS) in FY 88. Geodetic Surveys were performed in support of the Federal Aviation Administration's Airport Datum Monumentation (ADAM) Program at the following three airports: Cut Bank, Shelby, and Conrad.

In FY 89, 22 horizontal and 107 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,405 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

177	Great Falls (OC/ODS)
266	Missoula (OC/ODS)
632	West Yellowstons (OC/ODS)
6781	Laurel (OC/ODS)

4. Planned C&GS Initiatives for the State of Montana During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 44 state affiliates of the NOAA/NGSD automatic subscriber service in Montana. This will also improve services for ad hoc requestors from the state.

A geodetic control survey will be performed at Miles City as part of the U.S. Eastern Strain Network.

Aeronautical Charting. Three OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 18 authorized NOS chart agents in the state can be improved during FY 92.

5. Specific Issues of Interest to the State of Montana

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public

agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

High precision statewide GPS networks meeting high accuracy standards are being established, in response to individual state requests, throughout the United States to support surveying and mapping activities with those states. The Statewide High Accuracy GPS network covering the State of Montana contains 14 stations. Spacing between adjacent stations in the network will be approximately 160 kilometers; in the southwest part of the state, spacing will be no greater than 80 kilometers. Four of the stations, DILLON, BOZEMAN, MISSOULA, and BUTTE, were precisely connected to the 1987 Yellowstone-Hebgen Lake crustal motion survey and station MILES CITY is included in the U.S. Eastern Strain Network thus connecting the network to the National Crustal Motion Network (NCMN). In addition to the basic 14 stations of the statewide network, approximately 30 existing stations are planned to be occupied during the high precision survey. This network is being established as a cooperative activity between the Montana Department of Transportation (MDOT) and the National Geodetic Survey Division (NGSD). Mr. Robert Custer, MDOT, assisted by Mr. Charles Wright, NGSD geodetic advisor to the State of Montana, are developing and coordinating the State's effort in establishing the network. Field observations to complete the project are scheduled for FY 91.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Wyoming

1. Name and Status of C&GS Programs for Wyoming During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 5,240 horizontal control points and 11,174 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging State agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Three OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Wyoming. Visual chart coverage includes four Sectional Charts that are updated every six months and two World Aeronautical Charts that are updated annually.

Instrument chart coverage includes 3 Low and High Altitude Enroute Charts and 47 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....2
Standard Terminal Arrival Charts (STAR's).....0
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....8
  Category II ILS - special aircrew and aircraft
                certification required.....0
  Category III A ILS - special aircrew and aircraft
                certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....12
  Very High Frequency Omnidirectional Range (VOR).....26
  Area Navigation (RNAV).....0
  Localizer (LOC) and Localizer Backcourse (LOCBC).....1
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....1
TOTAL 50

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Wyoming. The IAP's are updated on a 56-day cycle.

BIG PINEY-MARBLETON
CHEYENNE MUNICIPAL
CONVERSE COUNTY
EVANSTON/UINTA COUNTY-
  BURNS FIELD
FORT BRIDGER
GENERAL BRESS FIELD
GILLETTE-CAMPBELL COUNTY
JACKSON HOLE
JOHNSON COUNTY
MONDELL FIELD
NATRONA COUNTY INTERNATIONAL
NORTH BIG HORN COUNTY
POWELL MUNICIPAL
RALPH WENZ FIELD
RAWLINS MUNICIPAL
RIVERTON REGIONAL
ROCK SPRINGS-SWEETWATER COUNTY
SHERIDAN COUNTY
SOUTH BIG HORN COUNTY
TORRINGTON MUNICIPAL
WORLAND MUNICIPAL
YELLOWSTONE REGIONAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of Wyoming. The SID's are updated on a 56-day cycle.

NATRONA COUNTY INTERNATIONAL

2. Current and Future Funding of C&GS Programs in the State of Wyoming

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Surveys:				
NGRS Leveling (190 km)	-	-	76.0	1.7
Strain Network (1 Station)	-	-	2.0	0.1
OC Program	63.0	0.9	42.0	0.6
Aeronautical Charting	262.2	3.0	262.2	3.0
TOTAL	325.2	3.9	382.2	5.4

3. Significant Past C&GS Involvement in the State of Wyoming in Previous Years

Geodesy. Six calibration base lines were established in the State: Casper, Cheyenne, Gillette, Rawlins, Rock Springs, and Worland. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,783 kilometers (km) of releveling was accomplished in Wyoming during the period FY 83-87.

In FY 89, geodetic control surveys were performed at five airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program.

In FY 89, 36 horizontal and 13 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,666 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. The following OC/ODS' and SNS' were published in FY 90:

388 Sherdian (OC/ODS)
531 Greybull (OC/ODS)
801 Worland (OC/ODS)
6845 Torrington (OC/ODS)

4. Planned C&GS Initiatives in the State of Wyoming During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 45 state affiliates of the NOAA/NGSD automatic subscriber service in Wyoming. This will also improve services for ad hoc requestors from the state.

A geodetic control survey will be performed at Cheyenne as part of the U.S. Eastern Strain Network.

In support of the NGRS, 190 kms of leveling will be performed.

Aeronautical Charting. Two OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 14 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

5. Specific Issues of Interest to the State of Wyoming

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping

to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Utah

1. Name and Status of C&GS Programs for Utah During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 4,816 horizontal control points and 12,199 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

In FY 91 geodetic control surveys will be performed at ten airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies

relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Utah. Visual chart coverage includes three Sectional Charts and one Terminal Area Chart that are updated every six months, and three World Aeronautical Charts that are updated annually.

Instrument chart coverage includes 5 Low and High Altitude Enroute Charts and 36 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....1
Standard Terminal Arrival Charts (STAR's).....1
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....7
  Category II ILS - special aircrew and aircraft
                  certification required.....1
  Category III A ILS - special aircrew and aircraft
                  certification required.....1
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....3
  Very High Frequency Omnidirectional Range (VOR).....22
  Area Navigation (RNAV).....2
  Localizer (LOC) and Localizer Backcourse (LOCBC).....0
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....3
TOTAL 41

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Utah. The IAP's are updated on a 56-day cycle.

BLANDING MUNICIPAL
BRIGHAM CITY
BRYCE CANYON
CANYONLANDS FIELD
CARBON COUNTY
CEDAR CITY MUNICIPAL
DELTA MUNICIPAL
DUCHESNE MUNICIPAL
HUNTINGTON MUNICIPAL
LOGAN-CACHE
MILFORD MUNICIPAL
OGDEN-HINCKLEY
PROVO MUNICIPAL
ROOSEVELT MUNICIPAL

SALT LAKE CITY INTERNATIONAL
SALT LAKE CITY MUNICIPAL #2
ST. GEORGE MUNICIPAL
VERNAL
WENDOVER

The following is a list of Standard Instrument Departure (SID) charts available for the state of Utah. The SID's are updated on a 56-day cycle.

SALT LAKE CITY INTERNATIONAL

The following is list of Standard Terminal Arrival (STAR) charts available for the state of Utah. The STAR's are updated on a 56-day cycle.

SALT LAKE CITY INTERNATIONAL

2. Current and Future Funding of C&GS Programs in the State State of Utah

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Control Surveys:				
10 FAA Airports	85.0	1.9	-	-
OC Program	42.0	0.6	63.0	0.9
Aeronautical Charting	209.5	2.4	209.5	2.4
TOTAL	336.5	4.9	272.5	3.3

3. Significant Past C&GS Involvement in the State of Utah in Previous Years.

Geodesy. Three Calibration Base Lines were established in the State: Cedar City, Hiawatha, and Salt Lake City. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 1,236 kilometers (km) of releveling was accomplished in Utah during the period FY 83-85.

In FY 89, 22 horizontal and 231 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 2,327 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public.

The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. No OC/ODS or SNS were published in FY 90.

4. Planned C&GS Initiatives in the State of Utah During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 38 state affiliates of the NOAA/NGSD automatic subscriber service in Utah. This will also improve services for ad hoc requestors from the state.

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 27 authorized NOS chart agents in the state can be improved during FY 92.

Three OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of Utah

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish

prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information about Charting and Geodetic Service's (C&GS) Programs for Nevada

1. Name and Status of C&GS' Programs for Nevada During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 6,523 horizontal control points and 19,347 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

In FY 91, geodetic control surveys will be performed at 8 airports in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Nevada. Visual chart coverage includes six Sectional Charts and one Terminal Area Chart that are updated every six months, and three World Aeronautical Charts that are updated annually. Instrument chart coverage includes 5 Low and High Altitude Enroute Charts and 20 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....9
Standard Terminal Arrival Charts (STAR's).....3
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....2
  Category II ILS - special aircrew and aircraft
    certification required..... 0
  Category III A ILS - special aircrew and aircraft
    certification required.....0

Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
Nondirectional Radio Beacon (NDB).....2
Very High Frequency Omnidirectional Range (VOR).....11
Area Navigation (RNAV).....0
Localizer (LOC) and Localizer Backcourse (LOCBC).....2
Localizer Directional Aid (LDA).....1
Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....2
Airport Diagrams.....2
TOTAL 34

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Nevada. The IAP's are updated on a 56-day cycle.

DERBY FIELD
ELKO MUNICIPAL -
J.C. HARRIS FIELD
ELY AIRPORT-YELLAND FIELD
FALLON MUNICIPAL
LANDER COUNTY
MCCARRAN INTERNATIONAL
RENO CANNON INTERNATIONAL
RENO/STEAD
TONOPAH
WINNEMUCCA MUNICIPAL

The following is a lsit of Standard Instrument Departure (SID) charts available for the state of Nevada. The SID's are updated on a 56-day cycle.

MCCARRAN INTERNATIONAL
RENO CANNON INTERNATIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the state of Nevada. The STAR's are updated on a 56-day cycle.

MCCARRAN INTERNATIONAL

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

One OC/ODS is planned for publication in FY 91.

Nautical Charting. Charts 18665 (scale 40,000), Lake Tahoe, and 18687 SC (scale 48,000), Lake Mead, are on issue in the State of Nevada. No topographic/bathymetric maps are contemplated for Nevada.

There are seven Nautical Chart Sales Agents in this State. These are typically small retail sporting goods and marine service businesses in recreational areas, although some may be book stores, map dealers, etc., located in other parts of the State.

Nautical Publications. A new edition of Coast Pilot 7 is published annually.

2. Current and Future Funding of C&GS Programs in Nevada

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Geodetic Control Surveys: 8 FAA Airports	68.0	1.5	-	-
OC Program	21.0	0.3	-	-
Aeronautical Charting	241.9	2.8	241.9	2.8
TOTAL	330.9	4.6	241.9	2.8

3. Significant Past C&GS Involvement in the State of Nevada in Previous Years

Geodesy. One calibration base line was established in the State: Reno. Astronomic observations were performed in FY 74, and again in FY 82 in the Lake Tahoe area to verify the location of the California/Nevada border. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 2,548 kilometers (km) of releveling was accomplished in Nevada during the period FY 82-87.

In FY 89, 8 horizontal and 83 vertical control marks were recovered in the State.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,035 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. In FY 88, a new edition of Coast Pilot 7 and a new edition of a nautical chart, Chart 18687 - Lake Mead, were published.

Aeronautical Charting. One OC/ODS was published in FY 90.

4. Planned C&GS Initiatives for the State of Nevada During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 43 state affiliates of the NOAA/NGSD automatic subscriber service in Nevada. This will also improve services for ad hoc requestors from the state.

Aeronautical Charting. No OC/ODS's or SNS's are planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 21 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

Nautical Charting. During FY 92, no new editions of nautical charts are planned.

Nautical Publications. A new edition of Coast Pilot 7 is published annually.

5. Specific Issues of Interest to the State of Nevada

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Commmittee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Colorado

1. Name and Status of C&GS Programs for Colorado During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 7,337 horizontal control points and 16,701 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops on the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts of updating maps and data bases with new NAVD 88; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

A geodetic control survey involving 150 stations is planned in cooperation with the State of Colorado. Absolute gravity measurements are planned at Boulder and Golden.

Nautical Charting. There are two Nautical Chart Sales Agent in this State. These agents are marine service businesses located in Boulder and Denver.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Colorado. Visual chart coverage includes three Sectional Charts and one Terminal Area Chart that is updated every 6 months, and two World Aeronautical Charts that are updated annually. Instrument coverage includes 6 Low and High Charts and 77 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....4
Standard Terminal Arrival Charts (STAR's).....1
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....22
  Category II ILS - special aircrew and aircraft
                certification required.....1
  Category III A ILS - special aircrew and aircraft
                certification required.....1
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....18
  Very High Frequency Omnidirectional Range (VOR).....25
  Area Navigation (RNAV).....5
  Localizer (LOC) and Localizer Backcourse (LOCBC).....3
  Localizer Directional Aid (LDA).....2
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....4
TOTAL 86

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Colorado. The IAP's are updated on a 56-day cycle.

AKRON-WASHINGTON COUNTY
ASPEN-PITKIN COUNTY/
  SARDY FIELD
CENTENNIAL
CITY OF COLORADO SPRINGS
  MUNICIPAL
CORTEZ-MONTEZUMA COUNTY
CRAIG-MOFFAT
CROSSON FIELD
DOWNTOWN FORT COLLINS
DURANGO-LA PLATA COUNTY
EAGLE COUNTY REGIONAL
FORT COLLINS-LOVELAND
  MUNICIPAL
FORT MORGAN MUNICIPAL
FRONT RANGE
GARFIELD COUNTY REGIONAL
GREELEY-WELD COUNTY
GUNNISON COUNTY
HOLYOKE MUNICIPAL
JEFFCO
KIT CARSON COUNTY
LA JUNTA MUNICIPAL
LAMAR MUNICIPAL

LAS ANIMAS COUNTY
MC ELROY AIRFIELD
MEEKER
MONTE VISTA MUNICIPAL
MONTROSE COUNTY
PUEBLO MEMORIAL
ROUTT COUNTY STOL
SAN LUIS VALLEY REGIONAL/ BERGMAN FIELD
STAPLETON INTERNATIONAL
TRI-COUNTY
WALKER FIELD
YAMPA VALLEY

The following is a list of Standard Instrument Departure (SID) charts available for the State of Colorado. The SID's are updated on a 56-day cycle.

ASPEN-PITKIN COUNTY - SARDY FIELD
STAPLETON INTERNATIONAL
WALKER FIELD

The following is a list of Standard Terminal Arrival (STAR) charts available for the State of Colorado. The STAR's are updated on a 56-day cycle.

STAPLETON INTERNATIONAL

2. Current and Future Funding of C&GS Programs in the State of Colorado

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Surveys:				
NGRS Leveling (180 km)	-	-	72.0	1.6
GPS survey (150 stations)	225.0	5.0	-	-
Absolute gravity measurements	40.0	0.9	-	-
Strain Network (1 station)	-	-	2.0	0.1
OC Program	42.0	0.6	42.0	0.6
Aeronautical Charting	401.2	4.6	401.2	4.6
TOTAL	708.2	11.1	517.2	6.9

3. Significant Past C&GS Involvement in the State of Colorado in Previous Years

Geodesy. Ten Calibration Base Lines were established in the State: Craig, Denver, Ft. Carson, Golden, Lamar, Limon, Mesa, Montrose, Pinon Canyon, and Pueblo. In 1978, the NGSD and Jefferson County participated in a cooperative program to develop the local horizontal control network to provide a framework for a county-wide mapping program.

A cooperative vertical survey project (444 km) was performed along the Front Range in Colorado in FY 84. Twenty local county and city agencies participated in the project.

In support of the North America Vertical Datum (NAVD) readjustment project, a total of 2,300 kilometers (km) of releveling was accomplished in Colorado during the period FY 84-86. Also in FY 86, Global Positioning System (GPS) surveys were performed for the U.S. Army at Fort Carson (27 stations) and Pinon Canyon (25 stations); Aerospace Corp at Falcon Air Force Base-NORAD (11 stations); and Boulder County (56 stations). Geodetic surveys were performed in support of the Federal Aviation Administration's (FAA) Airport Datum Monumentation (ADAM) program in FY 86 at the following airports: Erie, Fort Collins, La Junta, and Trinidad.

In FY 88, NGSD recalibrated and reobserved five absolute gravity sites: Boulder AA and AE, Golden AA, Bergen Park AA, and Mt. Evans AA.

In FY 89, 10 horizontal and 24 vertical control points were recovered in the state.

In FY 90, geodetic control were established at five airports in the State in support of the FAA's ADAM program.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 3,316 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. A Special Aeronautical NAVAID Survey was completed for Gunnison (Gunnison County) Airport. Also in FY 90, a geodetic control survey was performed by GPS in Plattsville as part of the U.S. Eastern Strain Network. A new calibration baseline (CBL) was established in Limon and the CBLs in Denver and Mesa were verified. Absolute gravity measurements were made at Boulder, Golden, Mount Evans, and Bergen Park.

The following OC/ODS's and SNS's were published in FY 90:

5612 Denver (OC/ODS)
6338 Craig (OC/ODS)

4. Planned C&GS Initiatives in the State of Colorado During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 109 state affiliates of the NOAA/NGSD automatic subscriber service in Colorado. This will also improve services for ad hoc requestors from the state.

A GPS survey is planned at Plattsville as part of the U.S. Eastern Strain Network.

180 kms of leveling will be performed in support of the NGRS.

Aeronautical Charting. Two airport obstruction charts are scheduled to be published in FY 90. C&GS has not received FY 90 requirements for airport surveys from the FAA.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 76 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

Two OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of Colorado

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for Arizona

1. Name and Status of C&GS Programs for Arizona During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 11,936 horizontal control points and 22,718 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging State agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; workshops on NAD 83 and Global Positioning System (GPS); utilizing the NGRS as a framework for geograhpic information systems; assessing user impacts of updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

420 kms of leveling will be performed in support of the Phoenix area subsidence monitoring network.

Nautical Charting. There is one nautical chart, 18687 (scale 48,000), of Lake Mead on issue which provides coverage of this State's riverine waters. No new edition of this chart is planned for FY 91 or FY 92.

There are three Nautical Chart Sales Agents in this State. These agents are retail sporting goods and marine service businesses and map dealers located in the State.

Nautical Publications. A new edition of Coast Pilot 7 is published annually.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated

runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum take-off weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Five OC/ODS's are planned for publication in FY 91.

C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of Arizona. Visual chart coverage includes three Sectional Charts and one Terminal Area Chart that are updated every 6 months, and three World Aeronautical Charts that are updated annually. Instrument chart coverage includes 4 Low and High Altitude Enroute Charts and 49 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....8
Standard Terminal Arrival Charts (STAR's).....8
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....7
  Category II ILS - special aircrew and aircraft
                certification required.....0
  Category III A ILS - special aircrew and aircraft
                certification required.....0
  Microwave Landing System(MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....10
  Very High Frequency Omnidirectional Range (VOR).....25
  Area Navigation (RNAV).....3
  Localizer (LOC) and Localizer Backcourse(LOCBC).....2
  Localizer Directional Aid (LDA).....0
  Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....2
Airport Diagrams.....1
TOTAL 66

The following is a list of Instrument Approach Procedure (IAP) charts available for the State of Arizona. The IAP's are updated on a 56-day cycle.

AVI SUQUILLA
BISBEE-DOUGLAS INTERNATIONAL
CASA GRANDE MUNICIPAL
CHANDLER MUNICIPAL
ERNEST A. LOVE FIELD
FALCON FIELD
GLOBE-SAN CARLOS REGIONAL AIR FACILITY

GRAND CANYON NATIONAL PARK
KINGMAN
LAKE HAVASU CITY
LIBBY AAF/SIERRA VISTA MUNICIPAL
NOGALES INTERNATIONAL
PAGE MUNICIPAL
PHOENIX SKY HARBOR INTERNATIONAL
PHOENIX-DEER VALLEY MUNICIPAL
PULLIAM
RYAN FIELD
SCOTTSDALE MUNICIPAL
SEDONA
SHOW LOW MUNICIPAL
ST. JOHNS INDUSTRIAL AIR PARK
STELLAR AIRPARK
TUCSON INTERNATIONAL
WINDOW ROCK
WINSLOW MUNICIPAL
YUMA MCAS/YUMA INTERNATIONAL

The following is a list of Standard Instrument Departure (SID) charts availabe for the State of Arizona. The SID's are updated on a 56-day cycle.

PHOENIX SKY HARBOR INTERNATIONAL
SCOTTSDALE MUNICIPAL
TUCSON INTERNATIONAL

The following is a list of Standard Terminal Arrival (STAR) charts available for the State of Arizona. The STAR's are updated on a 56-day cycle.

CHANDLER MUNICIPAL
FALCON FIELD
GLENDALE MUNICIPAL
LUKE AIR FORCE BASE
PHOENIX SKY HARBOR INTERNATIONAL
PHOENIX-DEER VALLEY MUNICIPAL
PHOENIX GOODYEAR MUNICIPAL
SCOTTSDALE MUNICIPAL
STELLAR AIRPARK
TUCSON INTERNATIONAL

2. Current and Future Funding of C&GS Programs in the State of Arizona

Program Items	FY 91 Current Funding $K	FY 91 Positions	FY 92 Future Funding $K	FY 92 Positions
Geodetic Surveys:				
Subsidence Leveling (420 km)	168.0	3.7	-	-
Aeronautical Charting	336.3	3.8	336.3	3.8
OC Program	105.0	1.5	63.0	0.9
TOTAL	609.3	9.0	399.3	4.7

3. Significant Past C&GS Involvement in the State of Arizona in Previous Years

Geodesy. Four Calibration Base Lines were established in the State: Flagstaff, Kingman, Phoenix, and Tucson. Between FY 81 and FY 86, the NGSD performed vertical control surveys (80 km) and GPS surveys (36 stations) to monitor land subsidence in the vicinity of Phoenix, Arizona. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 4,219 kilometers (km) of releveling was accomplished in Arizona during the period FY 80-84.

In FY 86 and FY 87, geodetic surveys were performed at Globe, Mesa, and Show Low Airports in support of the Federal Aviation Administration's Airport Datum Monumentation program.

During FY 87, a cooperative reimbursable GPS survey (40 stations) was performed in the Avra Basin and Tucson Basin areas to monitor subsidence for the City of Tucson and the Water Resources Department, U.S. Geological Survey.

In FY 89, NGSD established absolute gravity stations in Tucson and Prescott, Arizona, in support of the joint Defense Mapping Agency and NGSD program to establish a primary absolute gravity network throughout the United States.

In FY 89, 38 horizontal and 197 vertical control points were recovered in the State.

In FY 90 calibration baselines were verified at Phoenix and Tucson. Absolute gravity measurements were made at Tucson.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 5,118 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. In FY 88, a new edition of nautical chart 18687, Lake Mead, was published. In FY 87, a new edition of the nautical chart was published.

Nautical Publications. A new edition of Coast Pilot 7 is published annually.

Aeronautical Charting. The following OC/ODS's and SNS's were published in FY 90:

5381 Grand Canyon (OC/ODS)
5651 Scottsdale (OC/ODS)

4. Planned C&GS Initiatives in the State of Arizona During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 47 state affiliates of the NOAA/NGSD automatic subscriber service in Arizona. This will also improve services for ad hoc requestors from the State.

Nautical Charting. The C&GS is planning to publish no new editions of the Lake Mead nautical chart during FY 92.

Nautical Publications. A new edition of Coast Pilot 7 is published annually.

Aeronautical Charting. Three OC/ODS's are tentatively planned for publication in FY 92.

A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 46 authorized NOS chart agents in the state can be improved during FY 92.

5. Specific Issues of Interest to the State of Arizona

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Service's (C&GS) Programs for New Mexico

1. Name and Status of C&GS Programs for New Mexico During FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 9,502 horizontal control points and 18,475 vertical control points in the State.

Budget reductions have resulted in the need for greater state participation in geodetic programs. Consequently, NGSD is urging state agencies to take over maintenance, restoration, and relocation of endangered NGSD monumentation to prevent the deterioration of the National Geodetic Reference System (NGRS). Other areas in which state assistance will be explored are: updating and automating station descriptions; conducting workshops the Global Positioning System (GPS); utilizing the NGRS as a framework for geographic information systems; assessing user impacts updating maps and data bases with new NAVD 88 heights; planning where geodetic control needs to be densified; and performing state high precision network upgrades where requested.

Under a cooperative agreement, a full-time resident advisor assists the State in planning surveys and trains State personnel in geodetic survey operations and procedures.

Aeronautical Charting. The C&GS provides extensive aeronautical chart coverage for pilots flying under visual and instrument conditions in the State of New Mexico. Visual chart coverage includes four Sectional Charts that are updated every six months and three World Aeronautical Chart that are updated annually. Instrument chart coverage includes 6 Low and High Altitude Enroute Charts and 53 Instrument Approach Procedure Charts in one bound volume.

During FY 91, the following instrument aeronautical charts are being produced for use during the transition between the take-off and enroute portion of flight and for the transition between the enroute portion of flight and the landing:

Standard Instrument Departure Charts (SID's).....2
Standard Terminal Arrival Charts (STAR's).....4
Precision Approach Procedure Charts:
  Instrument Landing System (ILS).....7
  Category II ILS - special aircrew and aircraft
    certification required 0
  Category III A ILS - special aircrew and aircraft
    certification required.....0
  Microwave Landing System (MLS).....0
Nonprecision Approach Procedure Charts:
  Nondirectional Radio Beacon (NDB).....15

Very High Frequency Omnidirectional Range (VOR).....24
Area Navigation (RNAV).....2
Localizer (LOC) and Localizer Backcourse (LOCBC).....5
Localizer Directional Aid (LDA).....0
Simplified Directional Facility (SDF).....0
Visual Approach Procedures.....0
Airport Diagrams.....1
TOTAL 60

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of New Mexico. The IAP's are updated on 56-day cycle.

ALAMOGORDO -
WHITE SANDS REGIONAL
ALBUQUERQUE INTERNATIONAL
ALEXANDER MUNICIPAL
ARTESIA MUNICIPAL
BLACK ROCK
CANNON AFB
CAVERN CITY AIR TERMINAL
CLOVIS MUNICIPAL
DEMING MUNICIPAL
DOUBLE EAGLE II
FOUR CORNERS REGIONAL
GALLUP MUNICIPAL
LAS CRUCES INTERNATIONAL
LAS VEGAS MUNICIPAL
LEA COUNTY-HOBBS
PORTALES MUNICIPAL
RATON MUNICIPAL-
CREWS FIELD
ROSWELL INDUSTRIAL AIR CENTER
SANTA FE COUNTY MUNICIPAL
SIERRA BLANCA REGIONAL
SILVER CITY-GRANT COUNTY
SOCORRO MUNICIPAL
TAOS MUNICIPAL
TRUTH OR CONSEQUENCES
MUNICIPAL
TUCUMCARI MUNICIPAL

The following is a list of Standard Instrument Departure (SID) charts available for the state of New Mexico. The SID's are updated on a 56-day cycle.

ALBUQUERQUE INTERNATIONAL
SANTA FE COUNTY MUNICIPAL

The following is lsit of Standard Terminal Arrival (STAR) charts available for the state of New Mexico. The STAR's are updated on a 56-day cycle.

ALBUQERQUE INTERNATIONAL

The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

Two OC/ODS's are planned for publication in FY 91.

2. Current and Future Funding of C&GS Programs in the State of New Mexico

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Geodetic Advisor (50/50 Cost Sharing)	80.0	1 part-time	80.0	1 part-time
Geodetic Surveys: Strain Network (1 station)	-	-	2.0	0.1
OC Program	42.0	0.6	42.0	0.6
Aeronautical Charting	94.4	1.1	94.4	1.1
TOTAL	216.4	2.2	218.4	2.3

3. Significant Past C&GS Involvement in the State of New Mexico in Previous Years

Geodesy. Three calibration base lines were established in the State: Albuquerque, Santa Fe, and Silver City. In a cooperative program with Sandia Laboratories, 517 km of vertical control surveys were performed in 1977 for monitoring ground movement in an area proposed for disposal of hazardous wastes. Approximately 200 km were resurveyed at Carlsbad in 1981. Control surveys to study vertical crustal movement were performed in the vicinity of Socorro in 1978. In support of the North America Vertical Datum (NAVD) readjustment project, a total of 3,195 kilometers (km) of releveling was accomplished in New Mexico during the period FY 80-85.

Geodetic Surveys were performed in support of the Federal Aviation Administration's Airport Datum Monumentation (ADAM) program at the following 11 airports in FY 88: Artesia, Belen,

Deming, Las Vegas, Portales, Raton, Socorro, Taos, Truth or Consequences, Tucumcari, and Zuni.

In FY 89, 28 horizontal and 45 vertical control marks were recovered in the State.

With the conclusion of the North Amercian Datum 1983 (NAD 83) adjustment in July 1986, 4,683 horizontal control stations within the State were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Aeronautical Charting. No OC/ODS or SNS was published in FY 90.

4. Planned C&GS Initiatives in the State of New Mexico During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 54 state affiliates of the NOAA/NGSD automatic subscriber service in New Mexico. This will also improve services for ad hoc requestors from the state.

A geodetic control survey by GPS is planned at Albuquerque as part of the U.S. Eastern Strain Network.

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 24 authorized National Ocean Service (NOS) chart agents in the State can be improved during FY 92.

Two OC/ODS's are tentatively planned for publication in FY 92.

5. Specific Issues of Interest to the State of New Mexico

Geodesy. For 10 years the National Geodetic Survey Division (NGSD) has maintained liaison with state and local public agencies plus surveying and mapping professional societies preparing them for the adoption of an international vertical control network called the North American Vertical Datum of 1988 (NAVD 88). An important feature of the NAVD 88 program is the releveling of 81,500 Km of primary leveling lines to strengthen the network. NGSD is developing information to assist users in adapting to the changes from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the NAVD 88 vertical reference system.

These changes will yield new benchmark height values and a new height reference datum that will affect the U.S. Geological

Survey's National Mapping Program and the Federal Emergency Management Agency's National Flood Insurance Program, as well as hundreds of local and regional cartographic data bases. NGSD is cooperating with the Federal Geodetic Control Committee and the American Congress on Surveying and Mapping to document the impact NAVD 88 will have on state, local, and private organizations.

High precision statewide Global Positioning System (GPS) networks meeting high accuracy standards are being established, in reponse to individual state requests, throughout the United States to support surveying and mapping activities with those states. The Statewide High Accuracy GPS network covering the State of New Mexico contains 42 stations. Within the State it has ties to the National Crustal Motion Network (NCMN) at Very Long Baseline Array sites, PIE TOWN and LOS ALAMOS, and the U.S. Eastern Strain Network station at Albuquerque, NEW MEXICO BASE 1. The network is also connected to the NCMN outside the state through the VLBI/Strain network sites at Ft. Davis, Texas - HARVARD RM 4, and Platteville, Colorado - PLATTEVILLE NCMN, and the strain station at Lubbock, Texas - LUBBOCK RFP. This network was established as a cooperative activity between the New Mexico State Highway and Transportation Department (NMSHTD) and the National Geodetic Survey Division (NGSD). Mr. Thomas Henderson, NMSHTD, coordinated the State's effort in establishing the network. Observations were performed at various times during the period November 1987 through 1989. Further data reduction and analysis are presently in progress.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' (C&GS) Programs for the U.S. Possession of Puerto Rico

1. Name and Status of C&GS Programs in the U.S. Possession of Puerto Rico for FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 1,798 horizontal control points in Puerto Rico. Thirty bench marks in Puerto Rico are also maintained in the NGSD data base.

Nautical Charting. There are 25 nautical charts and one bathymetric map which provide coverage of Puerto Rico's coastal areas and waterways. Seven new chart editions are scheduled for publication during FY 91. These new editions are:

Number	Scale	Name
25654	6500	Ensenada Honda
25659	20000	Puerto Maunabo
25665	20000	Punta Lima to Cape Batata
25667	10000	Bahia De Fajardo and Approaches
25668	100000	North Coast Puerto Rico
25673	15000	Bahia De Mayaquez and Approaches
25687	20000	Bahia De Jobos and Bahia De Rincon

There are 10 Nautical Chart Sales Agents on this island. These agents are typically retail sporting goods and marine service business in recreational areas, although some may be bookstores, map dealers, etc.

Nautical Publications. Puerto Rico's coastal navigation information is contained in Coast Pilot 5. A new edition of Coast Pilot 5 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage of Puerto Rico to the new North American Datum of 1983.

Aeronautical Charting. The C&GS provides aeronautical chart coverage for pilots flying under visual conditions in Puerto Rico. Visual chart coverage includes one Terminal Area Chart which is updated every 6 months.

The following is a list of Instrument Approach Procedure (IAP) charts available for the state of Puerto Rico. The IAP's are updated on a 56-day cycle.

DORADO
EUGENIO MARIA DE HOSTOS
ISLA GRANDE
LUIS MUNOZ MARIN
INTERNATIONAL
MERCEDITA
RAFAEL HERNANDEZ

The following is a list of Standard Instrument Departure (SID) charts available for the state of Puerto Rico. The SID's are updated on a 56-day cycle.

LUIS MUNOZ MARIN
INTERNATIONAL

2. Current and Future Funding of C&GS Programs in Puerto Rico

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Aeronautical Charting	64.9	0.7	64.9	0.7
Nautical Charting	16.9	0.3	19.4	0.4
TOTAL	81.8	1.0	84.3	1.1

3. Significant Past C&GS Involvement in Puerto Rico in Previous Years.

Geodesy. In FY 82, the National Geodetic Survey Division (NGSD) performed horizontal and vertical control surveys for the Corps of Engineers on Puerto Rico in support of the Cerrillos Dam Project.

In FY 89, three horizontal control marks were recovered in Puerto Rico.

With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 1,159 horizontal control stations within Puerto Rico were evaluated; adjusted and published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper 2NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. Two new nautical chart editions were published in FY 89, with nine new editions scheduled for publication in FY 90. New Coast Pilot 5 editions are published annually. The new chart editions were:

Number	Scale	Name
25650	100000	Virgin Passage and Sonda De Vieques
25661	10000	Puerto Yabucoa
25663	40000	Pasaje San Juan to Puerto Humacao
25664	25000	Pasaje De Vieques and Radas Roosevelt
25666	10000	Ensenada Honda
25670	10000	Bahia De San Juan
25675	10000	Bahia De Boqueron
25677	100000	South Coast of Puerto Rico
25679	10000	Bahia De Guanica
25685	20000	Punta Petrona to Isla Caja De Muetros

4. Planned C&GS Initiatives in Puerto Rico During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 11 affiliates of the NOAA/NGSD automatic subscriber service in Puerto Rico and the U.S. Virgin Islands. This will also improve services for ad hoc requestors.

Aeronautical Charting. A program is being developed to determine if the chart distribution service to subscribers, to catalog order customers, and to the 3 authorized NOS chart agents can be improved during FY 92.

Nautical Charting. Eight new editions of nautical charts are scheduled for publication during FY 92. A new edition of Coast Pilot 5 is published on an annual basis. The new chart editions are:

Number	Scale	Name
25650	100000	Virgin Passage and Sonda de Vieques
25655	10000	Ensenada Honda to Canal De Louis Pena
25663	40000	Pasaje San Juan to Puerto Humacao
25664	25000	Pasaje de Vieques and Radas Roosevelt
25670	10000	Bahia De San Juan
25681	10000	Bahia De Guayanilla
25683	20000	Bahia De Ponce and Approaches
25689	20000	Puerto Arroyo

5. Specific Issues of Interest to the U.S. Possession of Puerto Rico

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' (C&GS) Programs for the U.S. Virgin Islands

1. Name and Status of C&GS Programs in the U.S. Virgin Islands for FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 463 horizontal control points in the U.S. Virgin Islands.

Nautical Charting. There are seven nautical charts and one bathymetric map which provide coverage of the U.S. Virgin Island's coastal areas and waterways. Four new chart editions are scheduled for publication during FY 91. These new editions are:

Number	Scale	Name
25640	326856	Puerto Rico and Virgin Islands
25641	100000	Virgin Islands
25645	10000	Christiansted Harbor
25649	10000	Saint Thomas Harbor

There are four Nautical Chart Sales Agents on these Islands. These agents are typically small retail sporting goods and marine service businesses in recreational areas, although some may be bookstores, map dealers, etc.

Nautical Publications. Coastal navigation information concerning the U.S. Virgin Islands is contained in Coast Pilot 5. A new edition of Coast Pilot 5 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage of the U.S. Virgin Islands to the new North American Datum of 1983.

Aeronautical Charting. The Airport Obstruction Chart (OC) is a 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity. Also included, are tabulations of runway and other operational data.

The Obstruction Data Sheet (ODS) is a digital derivative of the OC which presents runway and obstruction data in a tabular format.

A Special NAVAID Survey (SNS) is a field survey that determines the position and elevation of navigational aids and associated

runway points and ties these items to the National Geodetic Reference System. No obstruction work is performed.

The OC, ODS, and SNS provide information for determining maximum takeoff weights, building instrument approach and departure procedures, and conducting engineering studies relative to obstruction clearing and airport facility improvements.

No OC/ODS's are planned for the U.S. Virgin Islands in FY 91.

The C&GS provides aeronautical chart coverage for pilots flying under visual conditions in the U.S. Virgin Islands. Visual chart coverage includes one Terminal Area Chart that is updated every six months.

The following is a list of Instrument Approach Procedure (IAP) charts available for the U.S. Virgin Islands. The IAP's are updated on a 56-day cycle.

ALEXANDER HAMILTON
CYRIL E. KING

The following is a list of Standard Instrument Departure (SID) charts available for the U.S. Virgin Islands. The SID's are updated on a 56-day cycle.

ALEXANDER HAMILTON
CYRIL E. KING

2. Current and Future Funding of C&GS Programs in the U.S. Virgin Islands

Program Items	FY 91 Current Funding $K	FY 91 Current Funding Positions	FY 92 Future Funding $K	FY 92 Future Funding Positions
Aeronautical Charting	23.6	0.3	23.6	0.3
OC Program	-	-	-	-
Nautical Charting	9.7	0.2	2.5	0.1
TOTAL	33.3	0.5	26.1	0.4

3. Significant Past C&GS Involvement in the U.S. Virgin Islands in Previous Years.

Geodesy. With the conclusion of the North American Datum 1983 (NAD 83) adjustment in July 1986, 308 horizontal control stations within the U.S. Virgin Islands were evaluated; adjusted and

published as part of the horizontal control network of the NGRS; and distributed to cooperating organizations and the surveying and mapping public. The report, North American Datum of 1983, NOAA Professional Paper NOS 2, was published in the fall of 1990, thus completing the NAD 83 project.

Nautical Charting. One new nautical chart edition was published in FY 90. A new edition of Coast Pilot 5 is published annually. The new chart edition was:

Number	Scale	Name
25644	20000	Fredericksted Harbor

Aeronautical Charting. The following OC/ODS was published in FY 90.

5005 Charlotte Amalie

4. Planned C&GS Initiatives in the U.S. Virgin Islands During FY 92

Geodesy. A marketing plan is being developed in order to improve services provided to our 11 affiliates of the NOAA/NGSD automatic subscriber service in Puerto Rico and the U.S. Virgin Islands. This will also improve services for ad hoc requestors.

Aeronautical Charting. A program is being developed to determine if the chart distribution source to subscribers, to catalog order customers, and to one authorized National Ocean Service chart agent in the U.S. Virgin Islands can be improved during FY 92.

No OC/ODS's are planned for FY 92.

Nautical Charting. One new edition of a nautical chart is scheduled for printing during FY 92, and a new edition of Coast Pilot 5. The new chart edition is:

Number	Scale	Name
25640	326856	Puerto Rico and Virgin Islands

5. Specific Issues of Interest to the U.S. Virgin Islands

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' (C&GS) Programs for the U.S. Possession of Guam Island

1. Name and Status of C&GS Programs in the U.S. Possession of Guam Island for FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 196 horizontal control points in the U.S. Possession of Guam Island.

Nautical Charting. There are two nautical charts which provide coverage of the waters around Guam Island. There are no plans to publish either of these charts during FY 91.

Nautical Publications. Coastal navigation information concerning Guam Island is contained in Coast Pilot 7. A new edition of Coast Pilot 7 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage of Guam Island to the new World Geodetic System (Datum) of 1984. In addition, Loran-C lines of position have been added to all appropriate scale charts as an electronic aid to navigation.

2. Current and Future Funding of C&GS Programs in Guam Island

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	-	-	0.1	2.5

3. Significant Past C&GS Involvement in the U.S. Possession of Guam Island in Previous Years.

Geodesy. In FY 63, two leveling projects (142 benchmarks) were completed by the U.S. Coast and Geodetic Survey in the Apra Harbor area.

Nautical Charting. A new edition of Coast Pilot 7, and two new editions of nautical charts were printed in FY 89. In FY 90, a new edition of Coast Pilot 7, and no new editions of nautical charts were scheduled for publication.

4. Planned C&GS Initiatives in Guam Island During FY 92

Nautical Charting. One new nautical chart edition, and a new edition of Coast Pilot 7 are scheduled for publication in FY 92.

The chart is:

Number	Scale	Name
81054	10000	Apra Harbor - Guam

5. Specific Issues of Interest to Guam Island

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' (C&GS) Programs for the U.S. Possession of Wake Island

1. Name and Status of C&GS Programs in the U.S. Possession of Programs in the U.S. Possession of Wake Island for FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 24 horizontal control points in Wake Island.

Nautical Charting. There is one nautical chart which provides coverage of the waters around Wake Island. This chart is scheduled for publication in FY 91. The chart is:

Number	Scale	Name
81664	15000	Wake Island

Nautical Publications. Marine navigation information concerning Wake Island is contained in Coast Pilot 7. A new edition of Coast Pilot 7 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage of Wake Island to the new World Geodetic System (Datum) of 1984.

2. Current and Future Funding of C&GS Programs in Wake Island

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	2.4	0.1	-	-

3. Significant Past C&GS Involvement in Wake Island in Previous Years.

Nautical Charting. In FY 89 and FY 90, no new chart editions were published for Wake and Baker Island. New editions of Coast Pilot 7 were published for both years.

4. Planned C&GS Initiatives in Wake Island During FY 92

Nautical Charting. The C&GS is planning to publish a new edition of Coast Pilot 7, and no new editions of the nautical chart during FY 90.

5. Specific Issues of Interest to Wake Island

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' (C&GS) Programs for the U.S. Possessions of Howland and Baker Island

1. Name and Status of C&GS Programs in the U.S. Possessions of Howland and Baker Island for FY 91

Nautical Charting. There is one nautical chart which provides coverage of the water around Howland and Baker Islands. This chart will not be scheduled for publication in FY 91.

Nautical Publications. Marine navigation information concerning Howland and Baker Islands is contained in Coast Pilot 7. A new edition of Coast Pilot 7 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting its nautical chart coverage of Howland and Baker Islands to the new World Geodetic System (Datum) of 1984.

2. Current and Future Funding of C&GS Programs in Howland and Baker Island

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	-	-	0.1	2.5

3. Significant Past C&GS Involvement in Howland and Baker Island in Previous Years.

Nautical Charting. In FY 89 and FY 90, no new nautical chart edition was published for Howland and Baker Island. New editions of Coast Pilot 7 were published for both years.

4. Planned C&GS Initiatives in Howland and Baker Island During FY 92

Nautical Charting. A new nautical chart edition and a new edition of Coast Pilot 7 are scheduled for publication in FY 92. The chart is:

Number	Scale	Name
83116	15000	Jarvis-Baker-Howland Islands in the Pacific

5. Specific Issues of Interest to Howland and Baker Island

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' (C&GS) Programs for the U.S. Possession of Johnston Island

1. Name and Status of C&GS Programs in the U.S. Possession of Johnston Island for FY 91

Nautical Charting. There are two nautical charts which provide coverage of the waters around Johnston Island. There are no plans to publish either of these charts during FY 91.

Nautical Publications. Marine navigation information concerning Johnston Island is contained in Coast Pilot 7. A new edition of Coast Pilot 7 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting all of its nautical chart coverage of Johnston Island to the new World Geodetic System (Datum) of 1984.

2. Current and Future Funding of C&GS Programs in Johnston Island

	FY 91		FY 92	
	Current Funding		Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	-	-	-	-

3. Significant Past C&GS Involvement in Johnston Island in Previous Years.

In FY 89, no new nautical chart editions were published for Johnston Island. In FY 90, two new nautical chart editions were published. New editions of Coast Pilot 7 were published for both years. The charts are:

Number	Scale	Name
83633	200000	Approaches to Johnston Atoll
83637	50000	Johnston Atoll

4. Planned C&GS Initiatives in Johnston Island During FY 92

Nautical Charting. There are no new editions of nautical charts scheduled for publication in FY 92. A new edition of Coast Pilot 7 is published annually.

5. Specific Issues of Interest to Johnston Island

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' (C&GS) for the U.S. Possession of Jarvis Island

1. Name and Status of C&GS Programs in the U.S. Possession of Jarvis Island for FY 91

Nautical Charting. There is one nautical chart which provides coverage of the waters around Jarvis Island. There are no plans to publish this chart during FY 91.

Nautical Publications. Marine navigation information concerning Jarvis Island is contained in Coast Pilot 7. A new edition of Coast Pilot 7 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting its nautical chart coverage of Jarvis Island to the new World Geodetic System (Datum) of 1984.

2. Current and Future Funding of C&GS Programs in Jarvis Island

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	-	-	2.5	0.1

3. Significant Past C&GS Involvement in Jarvis Island in Previous Years.

Nautical Charting. In FY 89 and FY 90, no new nautical chart editions were published for Jarvis Island. New editions of Coast Pilot 7 were published for both years.

4. Planned C&GS Initiatives in Jarvis Island During FY 92

The C&GS is planning to publish a new edition of Coast Pilot 7, and no nautical chart editions during FY 90.

Nautical Charting. A new chart edition, and a new edition of Coast Pilot 7 are scheduled for publication in FY 92. The chart is:

Number	Scale	Name
83116	15000	Jarvis-Baker-Howland Islands in the Pacific

5. Specific Issues of Interest to Jarvis Island

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' Programs for the U.S. Possession of Palmyra Atoll and Kingman Reef

1. Name and Status of C&GS Programs in the U.S. Possession of Palmyra Atoll and Kingman Reef for FY 91

Nautical Charting. There are two nautical charts which provide coverage of the waters around Palmyra Atoll and Kingman Reef. One new nautical chart edition is scheduled for publication in FY 91. The chart is:

Number	Scale	Name
83157	10000	Palmyra Atoll

Nautical Publications. Marine navigation information concerning Palmyra Atoll and Kingman Reef is contained in Coast Pilot 7. A new edition of Coast Pilot 7 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting its nautical chart coverage of Palmyra Atoll and Kingman Reef to the new World Geodetic System (Datum) of 1984.

2. Current and Future Funding of C&GS Programs in Palmyra Atoll and Kingman Reef

	FY 91		FY 92	
	Current Funding		Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	0.1	2.4	-	-

3. Significant Past C&GS Involvement in Palmyra Atoll and Kingman Reef in Previous Years.

Nautical Charting. In FY 89 and FY 90, no new nautical chart editions were published for Palmyra Atoll and Kingman Reef. New editions of Coast Pilot 7 were published for both years.

4. Planned C&GS Initiatives in Palmyra Atoll and Kingman Reef During FY 92

Nautical Charting. No new nautical chart editions are scheduled for publication in FY 92. A new edition of Coast Pilot 7 is scheduled for publication in FY 92..

5. Specific Issues of Interest to Palmyra Atoll

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' Programs for the U.S. Possession of American Samoa

1. Name and Status of C&GS Programs in the U.S. Possession of American Samoa for FY 91

Geodesy. The National Geodetic Survey Division (NGSD) maintains in the NGSD data base approximately 176 horizontal control points in the U.S. Possession of American Samoa.

Nautical Charting. There is one nautical chart which provides coverage of the waters in and around American Samoa. This chart will not be published during FY 91.

Nautical Publications. Marine navigation information concerning American Samoa is contained in Coast Pilot 7. A new edition of Coast Pilot 7 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting its nautical chart coverage of American Samoa to the new World Geodetic System (Datum) of 1984.

2. Current and Future Funding of C&GS Programs in American Samoa

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	-	-	-	-

3. Significant Past C&GS Involvement in American Samoa in Previous Years.

Nautical Charting. New editions of Coast Pilot 7 and no new editions of the nautical chart were printed in FY 89 and FY 90.

4. Planned C&GS Initiatives in American Samoa During FY 92

Nautical Charting. The C&GS is not planning to publish a new edition of nautical chart 83484 during FY 92. A new edition of Coast Pilot 7 is published annually.

5. Specific Issues of Interest to American Samoa Island

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at

least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' Programs for the U.S. Commonwealth of the Northern Marianas Islands

1. Name and Status of C&GS Programs in the U.S. Commonwealth of the Northern Marianas Islands for FY 91

Geodesy.

Nautical Charting. There are ten nautical charts which provide coverage of the coastal areas and waterways of the Commonwealth of the Northern Marianas Islands. There are no plans to publish any new editions of these charts in FY 91.

Nautical Publications. Marine navigation information concerning the Commonwealth of the Northern Marianas Islands is contained in Coast Pilot 7. A new edition of Coast Pilot 7 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting its nautical chart coverage of the Commonwealth of the Northern Marianas Islands to the new World Geodetic System (Datum) of 1984. In addition, Loran-C lines of position have been added to all appropriate scale charts as an electronic aid to navigation.

2. Current and Future Funding of C&GS Programs in U.S. Commonwealth of the Northern Marianas Islands

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	-	-	-	-

3. Significant Past C&GS Involvement in U.S. Commonwealth of the Northern Marianas Islands in Previous Years.

Nautical Charting. Three new nautical chart editions were published in FY 89, with three new nautical chart editions scheduled for printing in FY 90. New editions of Coast Pilot 7 were published in both years. The new chart editions published were:

Number	Scale	Name
81048	100000	Island of Guam-Marianas-Cocos Lagoon
91054	10000	Apra Harbor - Guam
81063	25000	Rota

81067	75000	Saipan and Tinian
81076	12000	Saipan Harbor
81092	25000	Pagan Island and Maug Island

4. Planned C&GS Initiatives in U.S. Commonwealth of the Northern Marianas Islands During FY 93

Nautical Charting. No new chart editions are scheduled for publication in FY 92. A new edition of Coast Pilot 7 is scheduled for publication in FY 92.

5. Specific Issues of Interest to U.S. Commonwealth of the Northern Marianas Islands

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' Programs for the U.S. Possession of Navassa Island

1. Name and Status of C&GS Programs in the U.S. Possession of Navassa Island for FY 91

Geodesy.

Nautical Charting. There is one nautical chart which provides coverage of the waters around Navassa Island. This chart is scheduled for publication in FY 91. This chart is:

Number	Scale	Name
26194	15000	Navassa Island

Nautical Publications. Marine navigation information concerning Navassa Island is contained in Coast Pilot 5. A new edition of Coast Pilot 5 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting its nautical chart coverage of Navassa Island to the new North American Datum of 1983.

2. Current and Future Funding of C&GS Programs in the U.S. Possession of Navassa Island

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	0.1	2.4	-	-

3. Significant Past C&GS Involvement in the U.S. Possession of Navassa Island in Previous Years

Nautical Charting. In FY 89 and FY 90, no new nautical chart editions were published for Navassa Island. New editions of Coast Pilot 5 were published for both years.

4. Planned C&GS Initiatives in the U.S. Possession of Navassa Island During FY 92

Nautical Charting. No new nautical chart editions are scheduled for publication in FY 92. A new edition of Coast Pilot 5 is scheduled for publication in FY 92.

5. Specific Issues of Interest to the U.S. Possession of Navassa Island

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

Aeronautical Charting.

See Appendix A

Information About Charting and Geodetic Services' Programs for the U.S. Possession of Swains Island

1. Name and Status of C&GS Programs in the U.S. Possession of Swains Island for FY 91

Geodesy.

Nautical Charting. There is one nautical chart which provides coverage of the waters around Swains Island. This chart is scheduled for publication in FY 91.

Nautical Publications. Marine navigation information concerning Swains Island is contained in Coast Pilot 7. A new edition of Coast Pilot 7 is scheduled for publication in FY 91.

As part of a continuous maintenance and improvement program, C&GS is currently in the process of converting its nautical chart coverage of Swains Island to the new World Geodetic System (Datum) of 1984.

2. Current and Future Funding of C&GS Programs in the U.S. Possession of Swains Island

	FY 91 Current Funding		FY 92 Future Funding	
Program Items	$K	Positions	$K	Positions
Nautical Charting	-	-	-	-

3. Significant Past C&GS Involvement in the U.S. Possession of Swains Island in Previous Years

Nautical Charting. In FY 89 and FY 90, no new nautical chart editions were published for Swains Island. New editions of Coast Pilot 7 were published for both years.

4. Planned C&GS Initiatives in the U.S. Possession of Swains Island During FY 92

Nautical Charting. No new nautical chart editions are scheduled for publication in FY 92. A new edition of Coast Pilot 7 is published annually.

5. Specific Issues of Interest to the U.S. Possession of Swains Island

Public Law 88-441 provides that the Secretary of Commerce publish prices of charts and related materials sold to the public at least once each calendar year. Specified elements of recoverable cost are recomputed annually to establish prices for each fiscal year. New chart prices are announced in August and become effective October 1st.

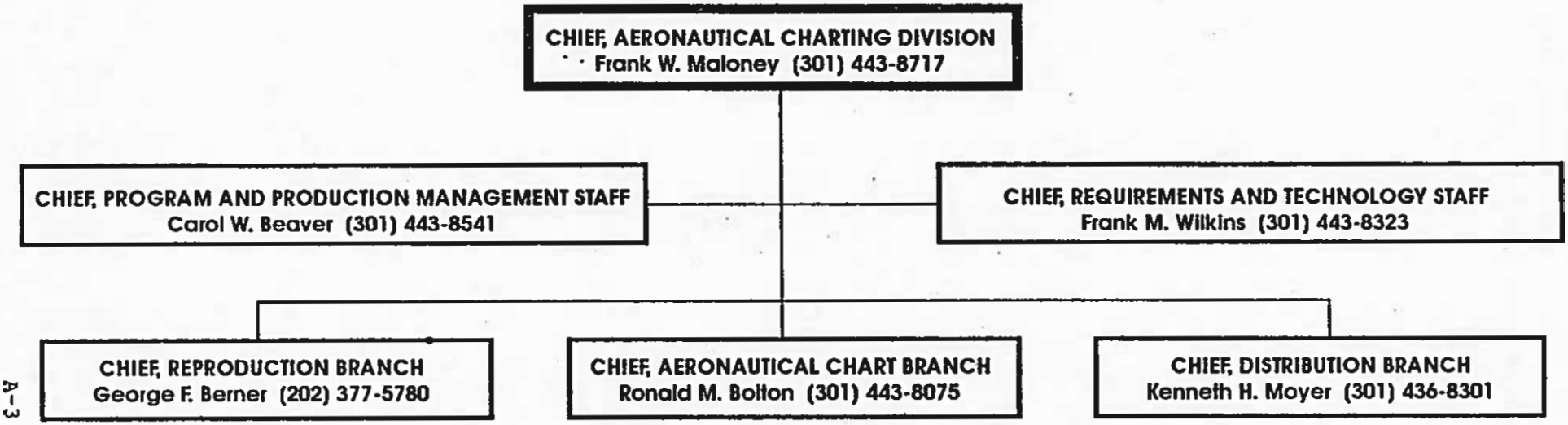
Aeronautical Charting.

See Appendix A

APPENDIX A

Aeronautical Charting. The state may wish to consider the possible applications from the development of new cartographic data base technology by the Aeronautical Chart Automation Project. This project provides automated support to chart compilation through its enhanced aeronautical data base, and improved capability to provide plotted output from the data base. When full automation is achieved, the system will consist of a central host computer, which will interface with graphic work stations and digitizing subsystems. This concept will allow for the automated production of the major aeronautical charting operations. Possible applications which can be generated from these systems are: terrain modeling; thematic maps for commercial planning; digital data for commercial applications; computerized mileage network or mileage for any geographic position(s) on NOS aeronautical charts; obstruction planning; and a network of obstructions' (antennas, stacks, towers, etc.) locations, including a listing of the geographic positions and elevations for all obstructions in the data base.

AERONAUTICAL CHARTING DIVISION

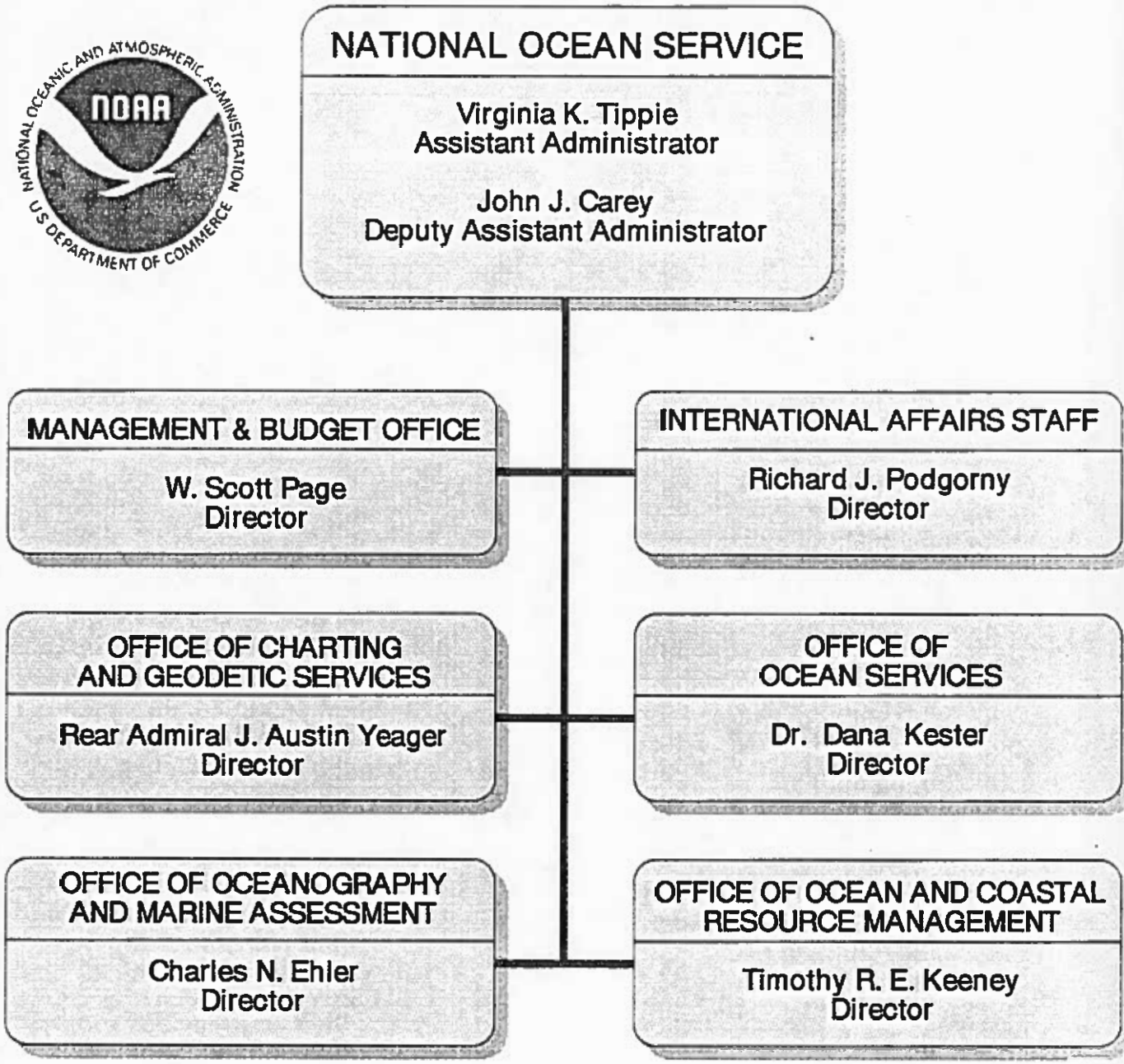


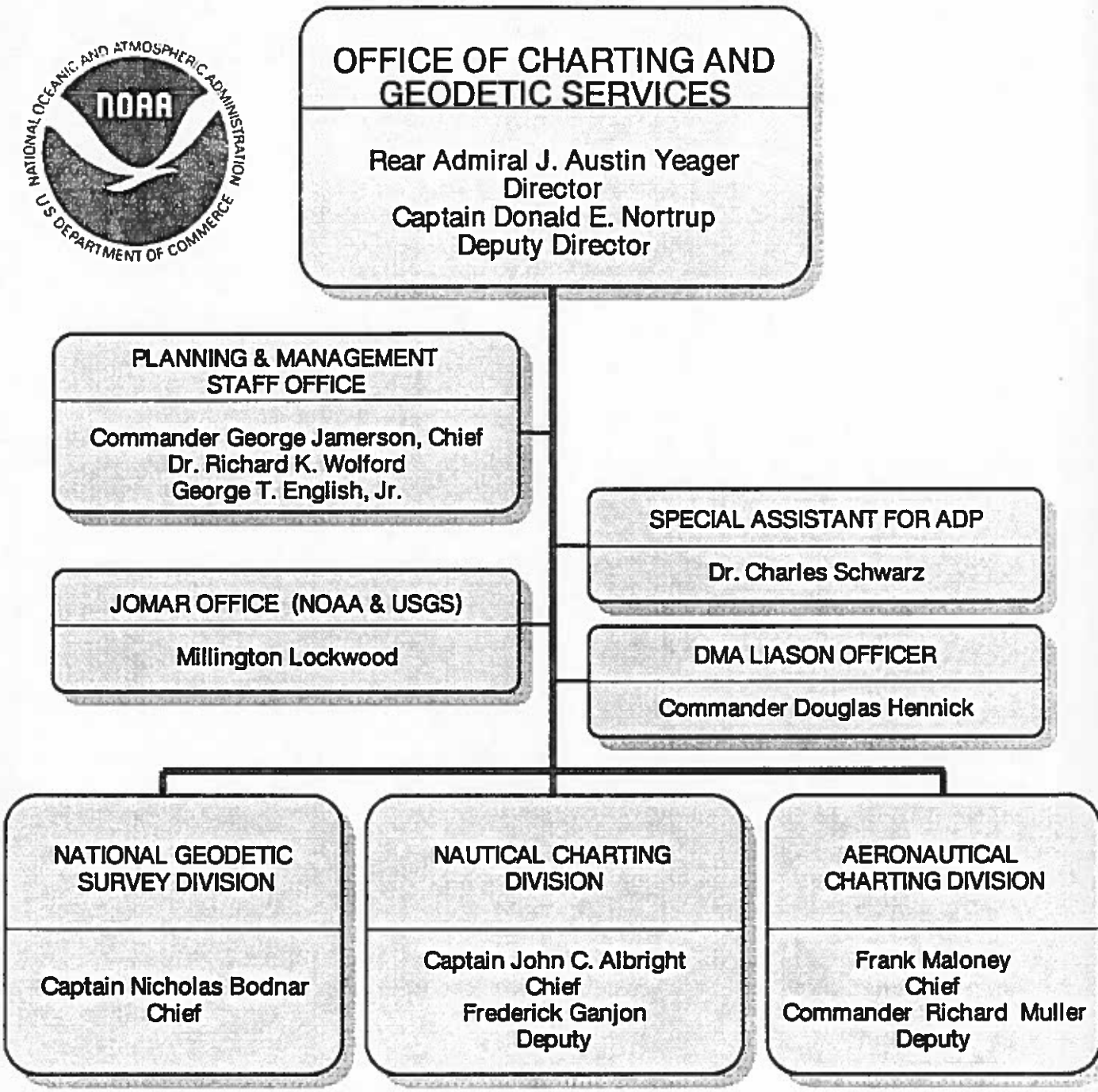
CONTACTS FOR SPECIAL PROGRAMS

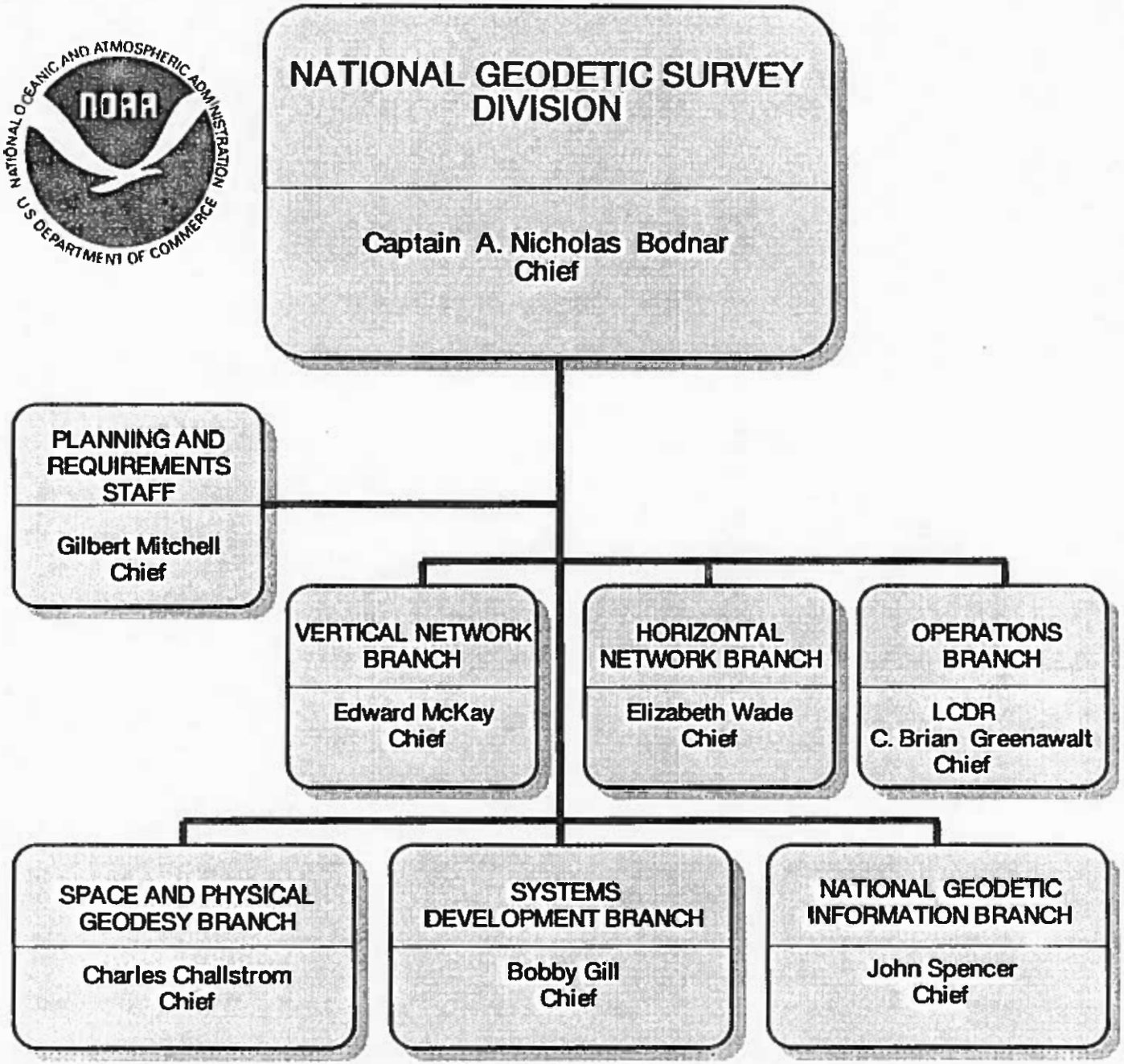
• NEW PROGRAMS AND PRODUCTS	Carol W. Beaver	(301) 443-8541
• VISUAL PROGRAMS	Linda J. Cushing	(301) 443-8976
• INSTRUMENT PROGRAMS	Ronald M. Bolton	(301) 443-8075
• SPECIAL PRODUCTS AND SERVICES	Benjamin C. Zollman	(301) 443-8948
• CHART AUTOMATION	Robert F. Niedermair	(301) 443-8092
• NEXT GENERATION CARTOGRAPHY PROJECT	Charles Brown	(301) 443-8323
• PROTOTYPE CD-ROM	David M. Dudish	(301) 443-8323
• NATIONAL AIRSPACE SYSTEM	Robert X. McCann	(301) 443-8323
• MANAGEMENT IMPROVEMENTS AND AUTOMATION	Daniel J. Minnick	(301) 443-8323
• MANAGEMENT INFORMATION SYSTEMS	Daniel J. Minnick	(301) 443-8323
• DISTRIBUTION FUNCTIONS	Kenneth H. Moyer	(301) 436-8301
• REPRODUCTION FUNCTIONS	George F. Berner	(202) 377-5780
• CHART PRICES AND MARKETING ACTIVITIES	Charles Brown	(301) 443-8323

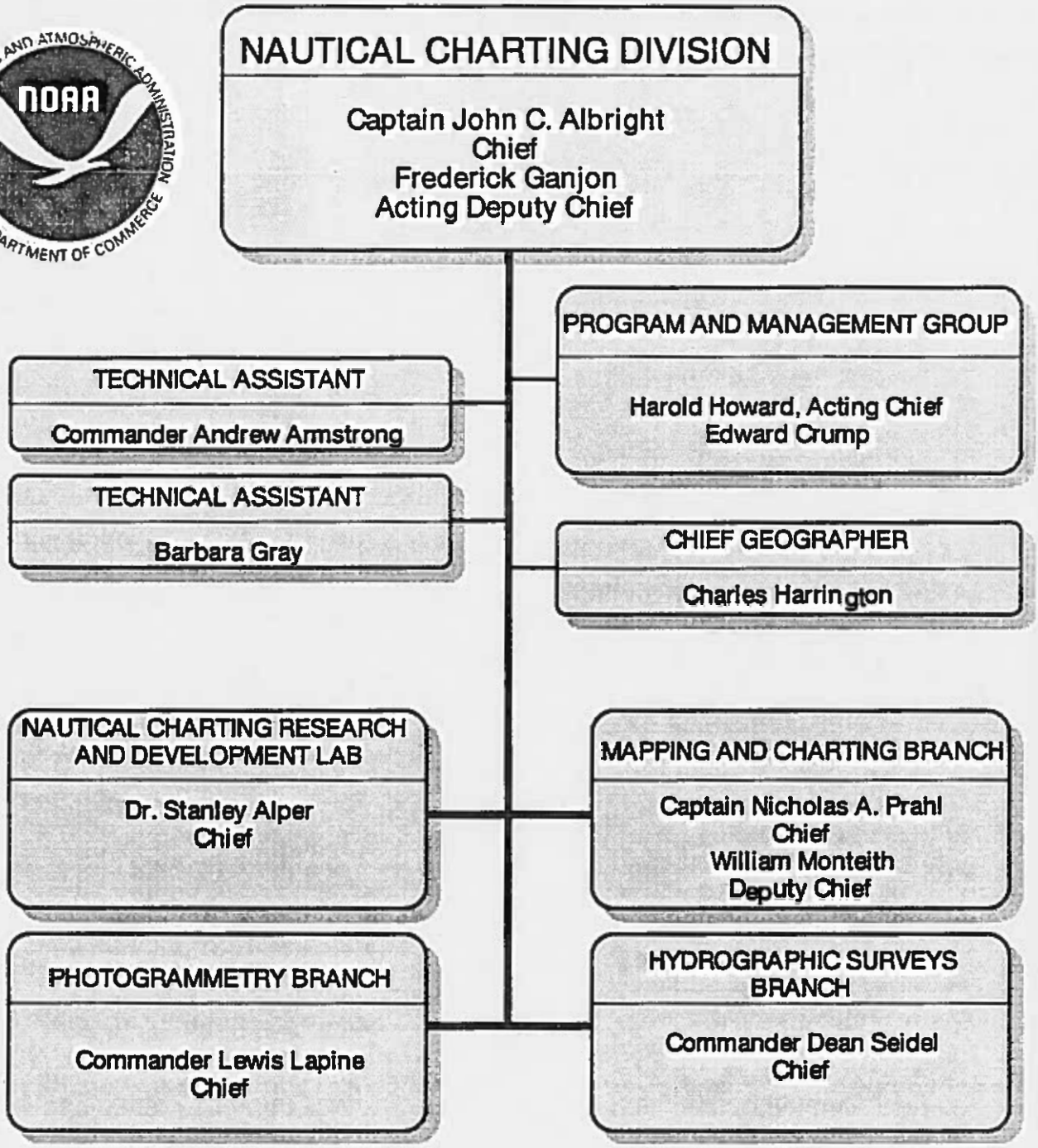
APPENDIX B

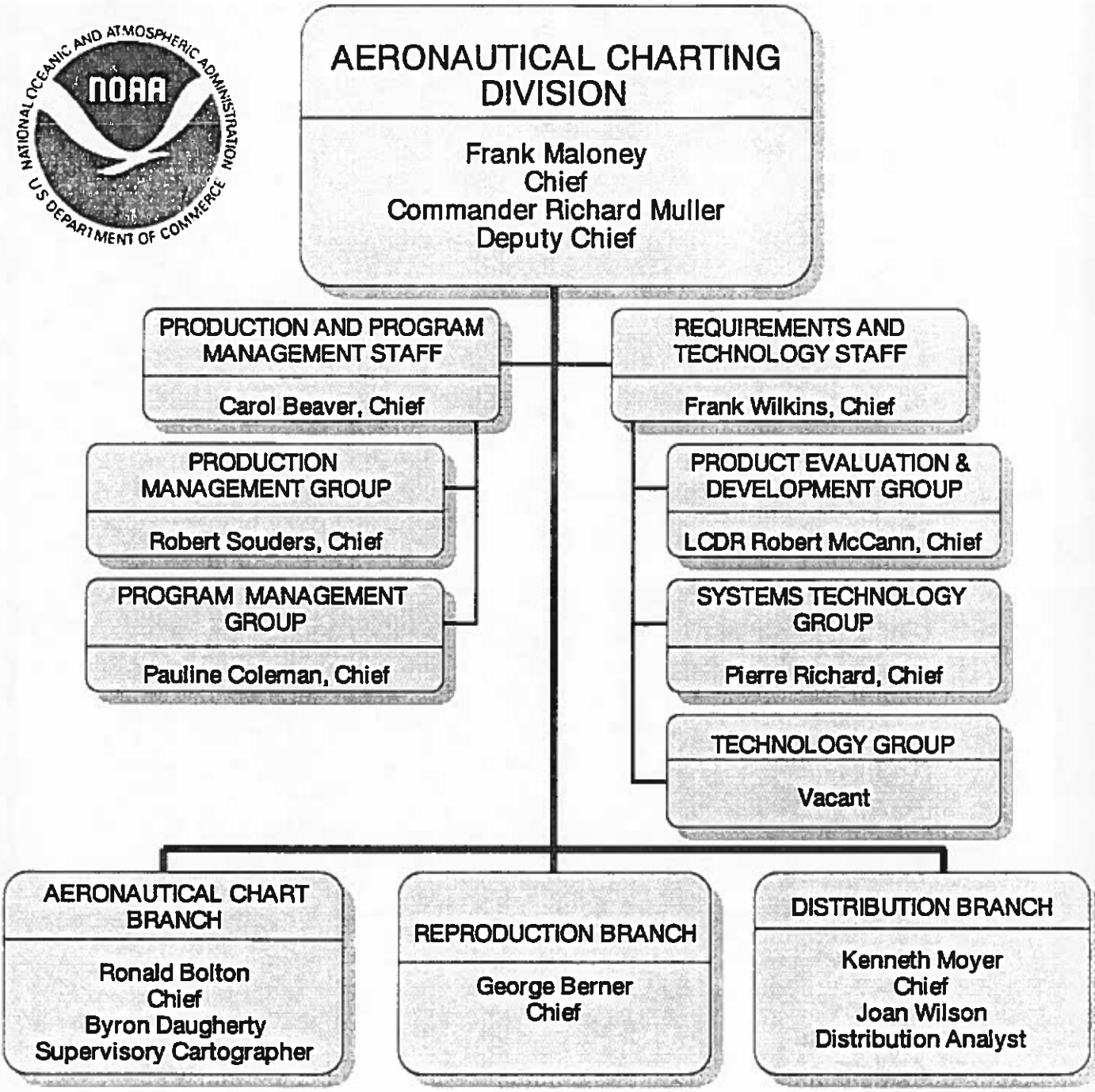
ORGANIZATIONAL DIAGRAMS


NATIONAL OCEAN SERVICE
Virginia K. Tippie
Assistant Administrator
John J. Carey
Deputy Assistant Administrator
MANAGEMENT & BUDGET OFFICE
W. Scott Page
Director
INTERNATIONAL AFFAIRS STAFF
Richard J. Podgorny
Director
OFFICE OF CHARTING AND GEODETIC SERVICES
Rear Admiral J. Austin Yeager
Director
OFFICE OF OCEAN SERVICES
Dr. Dana Kester
Director
OFFICE OF OCEANOGRAPHY AND MARINE ASSESSMENT
Charles N. Ehler
Director
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
Timothy R. E. Keeney
Director


OFFICE OF CHARTING AND GEODETIC SERVICES
Rear Admiral J. Austin Yeager
Director
Captain Donald E. Nortrup
Deputy Director
PLANNING & MANAGEMENT STAFF OFFICE
Commander George Jamerson, Chief
Dr. Richard K. Wolford
George T. English, Jr.
SPECIAL ASSISTANT FOR ADP
Dr. Charles Schwarz
JOMAR OFFICE (NOAA & USGS)
Millington Lockwood
DMA LIASON OFFICER
Commander Douglas Hennick
NATIONAL GEODETIC SURVEY DIVISION
Captain Nicholas Bodnar
Chief
NAUTICAL CHARTING DIVISION
Captain John C. Albright
Chief
Frederick Ganjon
Deputy
AERONAUTICAL CHARTING DIVISION
Frank Maloney
Chief
Commander Richard Muller
Deputy


NATIONAL GEODETIC SURVEY DIVISION
Captain A. Nicholas Bodnar
Chief
PLANNING AND REQUIREMENTS STAFF
Gilbert Mitchell
Chief
VERTICAL NETWORK BRANCH
Edward McKay
Chief
HORIZONTAL NETWORK BRANCH
Elizabeth Wade
Chief
OPERATIONS BRANCH
LCDR
C. Brian Greenawalt
Chief
SPACE AND PHYSICAL GEODESY BRANCH
Charles Challstrom
Chief
SYSTEMS DEVELOPMENT BRANCH
Bobby Gill
Chief
NATIONAL GEODETIC INFORMATION BRANCH
John Spencer
Chief


NAUTICAL CHARTING DIVISION
Captain John C. Albright
Chief
Frederick Ganjon
Acting Deputy Chief
PROGRAM AND MANAGEMENT GROUP
Harold Howard, Acting Chief
Edward Crump
TECHNICAL ASSISTANT
Commander Andrew Armstrong
TECHNICAL ASSISTANT
Barbara Gray
CHIEF GEOGRAPHER
Charles Harrington
NAUTICAL CHARTING RESEARCH AND DEVELOPMENT LAB
Dr. Stanley Alper
Chief
MAPPING AND CHARTING BRANCH
Captain Nicholas A. Prahl
Chief
William Monteith
Deputy Chief
PHOTOGRAMMETRY BRANCH
Commander Lewis Lapine
Chief
HYDROGRAPHIC SURVEYS BRANCH
Commander Dean Seidel
Chief


AERONAUTICAL CHARTING DIVISION
Frank Maloney
Chief
Commander Richard Muller
Deputy Chief
PRODUCTION AND PROGRAM MANAGEMENT STAFF
Carol Beaver, Chief
REQUIREMENTS AND TECHNOLOGY STAFF
Frank Wilkins, Chief
PRODUCTION MANAGEMENT GROUP
Robert Souders, Chief
PROGRAM MANAGEMENT GROUP
Pauline Coleman, Chief
PRODUCT EVALUATION & DEVELOPMENT GROUP
LCDR Robert McCann, Chief
SYSTEMS TECHNOLOGY GROUP
Pierre Richard, Chief
TECHNOLOGY GROUP
Vacant
AERONAUTICAL CHART BRANCH
Ronald Bolton
Chief
Byron Daugherty
Supervisory Cartographer
REPRODUCTION BRANCH
George Berner
Chief
DISTRIBUTION BRANCH
Kenneth Moyer
Chief
Joan Wilson
Distribution Analyst

APPENDIX C

CHARTING AND GEODETIC SERVICES

TELEPHONE DIRECTORY

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL OCEAN SERVICE

Routing Code	Org Code	Organization	Name	Telephone	Room	Location
N/CG	NB0000	DIRECTOR, CHARTING AND GEODETIC SERVICES	RADM J. Austin Yeager	443 8204	1006	WSC1
N/CGx1		Deputy Director	CAPT Nicholas A. Prahl	443 8128	1006	WSC1
N/CGx11		Chief, Planning and Management Staff	CDR. George W. Jamerson	443 8238	1016	WSC1
N/CGx2		Technical Advisor		443 8381	1005	WSC1
N/CGx3		Technical Advisor	Donald E. Pryor	443 8381	1005	WSC1
N/CGx4		Technical Advisor	Millington Lockwood	443 8536	1016	WSC1
N/CGx5		Chief, ADP Staff	Dr. Charles R. Schwarz	443 8381	1005	WSC1
N/CG1	NB1000	Chief, National Geodetic Survey Division	CAPT A. Nicholas Bodner	443 8100	429C	Rkwall
N/CG1x1		Admin Officer		443 8531	429D	Rkwall
N/CG1x5		Federal Geodetic Control Committee	Gilbert J. Mitchell	443 8143	110	Rkwall
N/CG1x10		Chief, Planning and Requirements Staff	Gilbert J. Mitchell	443 8218	110	Rkwall
N/CG11	NB1100	Chief, Geodetic Research and Development Laboratory	Bruce C. Douglas	443 8858	424	Rkwall
N/CG112	NB1120	Chief, Satellite and Ocean Dynamics Section	Robert Chaney	443 8556	426A	Rkwall
N/CG113	NB1130	Chief, Geodynamics Section	Sandford R. Holdahl	443 8528	513	Rkwall
N/CG114	NB1140	Chief, Advanced Technology Section	William E. Carter	443 8423	422	Rkwall
N/CG12	NB1200	Chief, Horizontal Network Branch	Elizabeth B. Wade	443 8168	429B	Rkwall
N/CG121	NB1210	Chief, Field Records Analysis Section	Thomas L. Green	443 8356	405	Rkwall
N/CG122	NB1220	Chief, Geodetic Reference System Section	Stephen J. Frakes	443 8740	400	Rkwall
N/CG123	NB1230	Chief, Special Projects Section	George M. Frank	443 8433	431	Rkwall
N/CG124	NB1240	Chief, FGCC Identification Section	Sherrill D. Snelgrove	443 8640	431	Rkwall
N/CG125	NB1250	Chief, New Datum Section	Vacant	443 8059	402	Rkwall
N/CG13	NB1300	Chief, Vertical Network Branch	Edward J. McKay	443 8567	313	Rkwall
N/CG131	NB1310	Chief, Vertical Projects Section	John H. Till	443 8147	311	Rkwall
N/CG132	NB1320	Chief, Geodetic Leveling Section	Emery I. Balazs	443 8567	312	Rkwall
N/CG133	NB1330	Chief, Vertical Analysis Section	John H. Richards	443 8147	311	Rkwall
N/CG134	NB1340	Chief, Vertical Data Section	Michael W. Day	443 8567	312	Rkwall
N/CG14	NB1400	Chief, Space and Physical Geodesy Branch	Charles W. Challstrom	443 8171	306	Rkwall
N/CG141	NB1410	Chief, Gravity and Geoid Section	Vacant	443 3122	107	Rkwall
N/CG142	NB1420	Chief, Special Applications Section	Vacant	443 8347	405	Rkwall
N/CG143	NB1430	Chief, Analysis and Design Section	Paul Spofford	443 8171	306	Rkwall
N/CG144	NB1440	Chief, Projects and Specifications Section	Larry D. Hothem	443 8171	306	Rkwall
N/CG15	NB1500	Chief, Systems Development Branch	Bobby Gill (Actg)	443 8638	429D	Rkwall
N/CG151	NB1510	Chief, Planning and Analysis Section	Ronald L. Shields	443 8598	426B	Rkwall
N/CG152	NB1520	Chief, Database and Applications Section	Gordon W. Adams	443 8180	426C	Rkwall
N/CG16	NB1600	Chief, Operations Branch	LCDR C. Brian Greenawalt	443 8792	26	Rkwall
N/CG161	NB1610	Chief, Field Operations Section	Harold G. Beard	443 8141	26	Rkwall
N/CG163	NB1630	Chief, Instrument & Equipment Section	Shepherd A. Cofer	703 373 1234		Corbin, VA
N/CG17	NB1700	Chief, National Geodetic Information Branch	John F. Spencer, Jr.	443 8281	20	Rkwall
N/CG171	NB1710	Chief, Horizontal Data Section	William R. Bishop	443 8775	19	Rkwall
N/CG174	NB1740	Chief, Information Services Section	Nathaniel B. Horn	443 8053	25	Rkwall
N/CG2	NB2000	Chief, Nautical Charting Division	CAPT. John Albright	443 8660	1026	WSC1
N/CG2x1		Deputy Chief	Fredrick K. Ganjon (Actg)	443 8117	1026	WSC1
N/CG2x2		Technical Assistant	CDR Andrew A. Armstrong	443 5875	1027	WSC1
N/CG2x3		Chief, Program Planning and Management Group	Harold V. Howard (Actg)	443 8354	1026	WSC1
N/CG2x4		Staff Assistant	CDR Russell C. Arnold	443 5875	1025	WSC1
N/CG2x5		Chief Geographer	Charles E. Harrington	443 8360	709	WSC1
N/CG2x6		Technical Assistant	Barbara E. Gray	443 5875	1027	WSC1
N/CG21	NB2100	Chief, Nautical Charting Research and Development Laboratory	Stanley Alper (Actg)	443 8874	510	WSC1
N/CG21x1		Deputy Chief		443 8874	510	WSC1

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL OCEAN SERVICE

Routing Code	Org Code	Organization	Name	Telephone	Room	Location
N/CG21x2		Technical Assistant	Walter M. Winn	443 8636	516	WSC1
N/CG21x3		Manager, Artificial Intelligence Programs	Dave L. Pendleton	443 8363	504	WSC1
N/CG211	NB2110	Chief, Hydrographic Technology Programs	Lloyd C. Huff	443 8638	515	WSC1
N/CG212	NB2120	Chief, Cartographic Technology Programs	James L. Lisle (Actg)	443 8061	504	WSC1
N/CG213	NB2130	Chief, Photogrammetric Technology Programs	Atef A. Elassal	443 8985	522	WSC1
N/CG214	NB2140	Chief, Special Programs	James R. Lucas	443 8874	509	WSC1
N/CG22	NB2200	Chief, Mapping and Charting Branch	CAPT Donald J. Florwick	443 8741	810	WSC1
N/CG22x1		Deputy Chief	William J. Monteith	443 8741	812	WSC1
N/CG22x2	NB2201	Chief, External and Cooperative Affairs Group	Dennis G. Carroll	443 8157	808	WSC1
N/CG22x3	NB2202	Chief, Quality Assurance, Plans and Standards Group	Howard P. Danley	443 8213	805	WSC1
N/CG221	NB2210	Chief, Nautical Data Section	Dennis J. Romesburg	443 8361	822	WSC1
N/CG2211	NB2211	Chief, Source Data Unit	James W. Dailey	443 8661	818	WSC1
N/CG2212	NB2212	Chief, Notice to Mariners Unit	Alfred E. Lundberg	443 8663	826	WSC1
N/CG222	NB2220	Chief, Data Base Section	Fannie B. Powers	443 4454	101	WSC2
N/CG2221	NB2221	Chief, Graphics Data Base Unit	Joseph W. Sherman	443 8772	827	WSC1
N/CG2222	NB2222	Chief, Digital Data Base Unit	Allen L. Taylor	443 8563	101	WSC2
N/CG2223	NB2223	Chief, Coast Pilot Unit	Lucien J. Larvadain	443 8084	709	WSC1
N/CG223	NB2230	Chief, Nautical Products Section	Andrew J. Lunday	443 8146	199	WSC2
N/CG2231	NB2231	Chief, Graphics Products Unit	William H. Wall	443 8173	199	WSC2
N/CG2232	NB2232	Chief, Digital Products Unit	Richard H. Davis	443 8035	199	WSC2
N/CG2233	NB2233	Chief, New Charts and Special Products Unit	James A. Graham	443 1260	199	WSC2
N/CG224	NB2240	Chief, Ocean Mapping Section	CAPT Albert E. Theberge, Jr.	443 8251	025	WSC2
N/CG2241	NB2241	Chief, Graphics Mapping Unit	Carl X. G. Fefe	443 8855	199	WSC2
N/CG2242	NB2242	Chief, Digital Mapping Unit	Vacant	443 8251	025	WSC2
N/CG2243	NB2243	Chief, Software Support Unit	Allen R. Greenberg	443 8251	025	WSC2
N/CG23	NB2300	Chief, Photogrammetry Branch	CDR Lewis A. Lapine	443 8744	727	WSC1
N/CG23x1		Chief, Production Requirement Group	Robert W. Radkey	443 8744	727	WSC1
N/CG231	NB2310	Chief, Quality Assurance Section	Frank A. Wright	443 8340	704	WSC1
N/CG232	NB2320	Chief, Planning Section	Michael L. McGinley	443 8370	724	WSC1
N/CG233	NB2330	Chief, Field Photogrammetry Section	CAPT Fidel T. Smith	827 6261		Norfolk, VA
N/CG2331	NB2331	Chief, Photogrammetric Unit	Vacant	827 6283		Norfolk, VA
N/CG2332	NB2332	Chief, Atlantic Field Surveys Unit	Vacant	827 6264		Norfolk, VA
N/CG2333	NB2333	Chief, Pacific Photogrammetric Party	J. Gary Frederick	392 6842		Seattle, WA
N/CG234	NB2340	Chief, Compilation Section A	Vacant	443 8210	024	WSC2
N/CG235	NB2350	Chief, Compilation Section B	John A. Mooney	443 8405	034	WSC2
N/CG236	NB2360	Chief, Support Section	Victor E. McNeel	443 8601	719	WSC1
N/CG24	NB2400	Chief, Hydrographic Surveys Branch	CDR Dean C. Seidel	443 8231	404	WSC1
N/CG24x1		Deputy Chief	Vacant	443 8232	404	WSC1
N/CG24x2		Technical Assistant for Data	Kenneth W. Wellman	443 8232	404	WSC1
N/CG24x3		Technical Assistant for Systems	Jack L. Wallace	443 8232	404	WSC1
N/CG24x4		Technical Assistants for Instrumentation	LCDR Samuel P. De Bow	443 8499	405	WSC1
			LCDR Nicholas E. Perugini	443 8499	405	WSC1
N/CG24x5		Staff Assistant	LTJG Guy T. Noll	443 8499	405	WSC1
N/CG24x6		Computer Programmer Analyst	John E. Green	443 8752	405	WSC1
N/CG24x7		Staff Assistant	LTJG Thomas R. Waddington	443 8499	405	WSC1
N/CG241	NB2410	Chief, Operations Section	LCDR Maureen R. Kenny	443 8752	408	WSC1
N/CG242	NB2420	Chief, Standards Section	George K. Myers	443 8266	405	WSC1
N/CG243	NB2430	Chief, Data Control Section	George H. Mastrogianis	443 8408	151	WSC2
N/CG243x1		Vault	Tyrone E. Holt	436 6964	145	Rdale
N/CG244	NB2440	Chief, Atlantic Hydrographic Section	CDR Christopher B. Lawrence	827 6746		Norfolk, VA
N/CG2441	NB2441	Computer Support Unit	LTJG Elizabeth Keane	827 6696		Norfolk, VA
N/CG2442	NB2442	Hydrographic Processing Unit	Rudolph D. Sanocki	827 6319		Norfolk, VA
N/CG2443	NB2443	Atlantic Hydrographic Party 1	LT Martin Conricote	827 6746		Norfolk, VA
N/CG2444	NB2444	Atlantic Hydrographic Party 2	LCDR V. Dale Ross	827 6746		Norfolk, Va
N/CG245	NB2450	Chief, Pacific Hydrographic Section	CDR Pamela R. Chelgren-Koterba	392 6835		Seattle, WA
N/CG2451	NB2451	Hydrographic Processing Unit	Dennis Hill	392 6853		Seattle, WA
N/CG2452	NB2452	Computer Support Unit	James W. Steensland	392 6845		Seattle, WA
N/CG2453	NB2453	Pacific Hydrographic Party	LTJG DeWayne Nodine	707 746 8189		Benicia, CA
N/CG3	NB3000	Chief, Aeronautical Charting Division	Frank W. Maloney	443 8717	1004	WSC5
		Deputy Chief, Aeronautical Charting Division	CDR Richard K. Muller	443 8711	1004	WSC5
N/CG3x1	NB3010	Chief, Program and Production Management Staff	Carol W. Beaver	443 8541	1021	WSC5
N/CG3x11		Program Management Group	Pauline Coleman	443 8917	1017	WSC5
N/CG3x12		Production Control Group	Robert F. Souders	443 8761	1025	WSC5
N/CG3x2	NB3020	Chief, Requirements & Technology Staff	Frank M. Wilkins	443 8323	1022	WSC5

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL OCEAN SERVICE

Routing Code	Org. Code	Organization	Name	Telephone	Room	Location
N/CG3x21		Systems Development Group	Pierre G. Richard	443 8323	1022	WSC5
		Technology Group	Vacant	443 8541	1022	WSC5
N/CG3x23		Product Evaluation & Development Group	LCDR Mark Finke	443 8711	1004	WSC5
N/CG3x4		Staff Distribution Analyst	Robert W. Byrd	443 8075	100	WSC5
N/CG31	NB3100	Chief, Aeronautical Chart Branch	Ronald M. Bolton	443 8075	100	WSC5
N/CG31x1		Assistant Chief	Byron Daugherty	443 8075	100	WSC5
N/CG31x2		Production & Resource Management Group	Rexford C. Anderson	443 8077	100	WSC5
N/CG31x3		Flight Operations Planner	Russell Hoover	443 8076	622	WSC5
N/CG311	NB3110	Chief, Aeronautical Information Section	Charles T. Branch	443 8770	613	WSC5
N/CG312	NB3120	Chief, Instrument Approach Procedure Chart Section	Gary H. Rogers	443 8906	502	WSC5
N/CG313	NB3130	Chief, Visual Chart Section	Vacant	443 8975	410	WSC5
N/CG314	NB3140	Chief, Enroute Navigation Section	Ben Zollman	443 8948	517	WSC5
N/CG315		Aeronautical Chart Automation Section	Robert Niedermair	443 8092	100	WSC5
N/CG32	NB3200	Chief, Reproduction Branch	George F. Berner	377 5780	1800A	HCHB
N/CG32x1	NB3201	Production Management Staff	Palmer Rutledge	377 5586	1808	HCHB
N/CG32x2	NB3202	Chief, Quality Assurance Unit	John Morrison	377 1953	1230	HCHB
N/CG322	NB3220	Chief, Pre-Press Section	Ernest Shepard	377 2777	B915	HCHB
N/CG323		Chief, Presswork Section	Donald Thomas	377 3496	B1111	
N/CG324		Chief, Finishing Section	Anthony Montgomery	377 5360	B815	
N/CG33	NB3300	Chief, Distribution Branch	Kenneth H. Moyer	436 8301	202A	Rdale
N/CG33x1		Project Manager	Joan Wilson	436 8301	201A	Rdale
N/CG33x2		Distribution Control Staff	Robert B. Swink	436 8431	210	Rdale
N/CG331	NB3310	Chief, Order Processing Section	Joyce B. Hahn	436 8301	207	Rdale
N/CG334	NB3340	Chief, Physical Sciences Service Section	Samuel Walinsky (Actg)	436 5766	105	Rdale

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WSC 1 = 6001 Executive Blvd.
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RKWALL = 11400 Rockville Pike
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RDALE = 6501 Lafayette Ave.
Riverdale, MD 20737

HCHB = Hoover Building
14th & constitution Ave., NW
Washington, DC 20230

CHARTING AND GEODETIC SERVICES
SCIENTIFIC REFERENCE LIST

SUBJECT	CONTACT		NUMBER
Charting and Geodetic Services	N/CGx11	RADM. J.Austin Yeager	443-8204
U.S. Geological Survey	N/CGx4	Millington Lockwood	443-8536
Geodesy	N/CG1	Capt. C. Andreasen	443-8100
Federal Geodetic Control Committee	N/CG1x5	Gilbert J. Mitchell	443-8143
Geodetic Data	N/CG17	John F. Spencer, Jr.	443-8281
Geodetic Field Parties	N/CG16	LCdr. Brian Greenawalt	443-8792
Geodetic Horizontal Datums	N/CG12	Elizabeth B. Wade	443-8168
Geodetic Research and Development	N/CG11	Bruce C. Douglas	443-8858
Geodetic Systems Development	N/CG15	Bobby Gill	443-8638
Geodetic Vertical Datums	N/CG13	Edward J. McKay	443-8567
Space and Physical Geodesy	N/CG14	Charles W. Challstrom	443-8171
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Photogrammetric Technology	N/CG213	Atef A. Elassal	443-8985
Aeronautical Charts	N/CG3	Frank W. Maloney	443-8717
Civil Aeronautical Charting Errors			800-626-3677
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