SECTION 2

RESOURCE INFORMATION AND AGENCY PROGRAM UPDATES

The tables in this section summarize budgetary information of the federal government for fiscal years (FY) 1999 and 2000. The funds shown are those used to provide meteorological services and associated supporting research that has as its immediate objective the improvement of these services. Fiscal data are current as of the end of June 1999 and are subject to later changes. The data for FY 2000 do not have legislative approval and do not constitute a commitment by the United States Government. The budget data are prepared in compliance with Section 304 of Public Law 87-843, in which Congress directed that an annual horizontal budget be prepared for meteorological programs conducted by the federal agencies.

AGENCY OBLIGATIONS FOR METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH

Table 2.1 contains fiscal information, by agency, for meteorological operations and supporting research. The table shows the funding level for FY 1999 based on Congressional appropriations, the budget request for FY 2000, the percent change, and the individual agencies' percent of the total federal funding for FY 1999 and FY 2000.

DEPARTMENT OF AGRICULTURE (USDA)

The USDA budget request for FY 2000 is $28.1 million for operations and supporting research and represents no change from FY 1999. The USDA assists the Department of Commerce in determining farmers' needs for weather information and in disseminating the information to them. Major USDA activities related to weather observations include incremental modernization of the snow telemetry (SNOTEL) system operated by the Natural Resources Conservation Service (NRCS) and the replacement of manual fire rating stations with remote automated weather stations (RAWS) by the Forest Service. The SNOTEL and RAWS networks provide cooperative data for NOAA's river forecast activities, the irrigation water supply estimates, and Bureau of Land Management operations.

For supporting research, USDA requested $15.5 million to focus on the interactions of weather and climate with plant and animal production and water resources management. The goal of supporting research is to develop and disseminate information and techniques to ensure an abundance of high-quality agricultural commodities and products while minimizing the adverse effects of agriculture on the environment. The research budget does not include the coordinated effort with EPA on ultraviolet radiation. The Forest Service supports a research program, initiated in 1988, for a long-term monitoring network to assess potential effects of global climate change and variability on forest health and productivity. Work also continues in forestry ecological systems modeling.

DEPARTMENT OF COMMERCE (DOC)

All reported DOC meteorological activities are within the National Oceanic and Atmospheric Administration (NOAA). The NOAA FY 2000 total congressional request of $1.38 billion for meteorological programs represents a 3.5 percent increase over the FY 1999 appropriated funds.

NOAA's FY 2000 operations and supporting research requests for major line-office activities are described below:

Weather Services

For FY 2000, the National Weather Service (NWS) requests a total $706.6 million. The request represents a net increase of $26 million from the FY 1999 base level. This includes an increase of $54.2 million in the Operations, Research, and Facilities (OR&F) Account and a decrease of $29.7 million in the Procurement, Acquisition, and Construction (PAC) Account. Overall, the FY 2000 request supports the funding and programmatic recommendations contained in the NOAA Review/Kelly Report. Within the amounts requested, NWS will maintain warning and forecasts services, continue the Modernization and Associated Restructuring, and invest in new initiatives to modernize weather observing systems and improve flood forecasting.

Detailed Program Changes:

The FY 2000 net increase of $54.2 million in the OR&F account includes:

- an increase of $18.7 million to account for Adjustments to Base within NWS base operations, including funding for the mandatory federal pay raise of 4.4 percent and increases in employee benefit rates.
- an increase of $1.0 million to continue mitigation actions per the Secretary's Report Team recommendations on the adequacy of NEXRAD Coverage and Degradation of Weather Services under NWS Modernization. In FY 2000, The NWS will operate Weather Forecast Offices (WFO) in Caribou, Maine and Key West, Florida and continue current oper-

TABLE 2.1 METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH COSTS*, BY AGENCY

(Thousands of Dollars)

AGENCY	Operations			% of FY2000	Supporting Research			% of FY2000	Total			% of FY1999	% of FY2000
	FY1999	FY2000	%CHG	TOTAL	FY1999	FY2000	%CHG	TOTAL	FY1999	FY2000	%CHG	TOTAL	TOTAL
Agriculture	12600	12600	0.0	0.5	15500	15500	0.0	3.9	28100	28100	0.0	1.1	1.0
Commerce/NOAA(Subtot)	1255914	1300982	3.6	56.4	72195	74241	2.8	18.5	1328109	1375223	3.5	54.0	50.7
NWS	662503	687039	3.7	29.8	18111	19547	7.9	4.9	680614	706586	3.8	27.7	26.1
NESDIS	574994	590786	2.7	25.6	9740	9800	0.6	2.4	584734	600586	2.7	23.8	22.2
OAR	3000	7390	146.3	0.3	43450	44000	1.3	10.9	46450	51390	10.6	1.9	1.9
NOS	8250	8250	0.0	0.4	0	0	0.0	0.0	8250	8250	0.0	0.3	0.3
NOAA Corps	7167	7517	4.9	0.3	894	894	0.0	0.2	8061	8411	4.3	0.3	0.3
Defense(Subtot)	375634	589240	56.9	25.5	89159.2	75208.2	-15.6	18.7	464793.2	664448.2	43.0	18.9	24.5
Air Force	146035	163378	11.9	7.1	37798	22406	-40.7	5.6	183833	185784	1.1	7.5	6.9
DMSP**	91916	271877	195.8	11.8	17932	21535	20.1	5.4	109848	293412	167.1	4.5	10.8
Navy	110335	117513	6.5	5.1	18684	17880	-4.3	4.4	129019	135393	4.9	5.2	5.0
Army	27348	36472	33.4	1.6	14745.2	13387.2	-9.2	3.3	42093.2	49859.2	18.4	1.7	1.8
Interior/BLM	800	1100	37.5	0.0	0	0	0.0	0.0	800	1100	37.5	0.0	0.0
Transportation(Subtot)	415045.5	401632.8	-3.2	17.4	17650	26457	49.9	6.6	432695.5	428089.8	-1.1	17.6	15.8
CG	6000	6000	0.0	0.3	0	0	0.0	0.0	6000	6000	0.0	0.2	0.2
FAA	409045.5	395632.8	-3.3	17.1	17325	24157	39.4	6.0	426370.5	419789.8	-1.5	17.3	15.5
FHWA	0	0	0.0	0.0	325	2300	607.7	0.6	325	2300	607.7	0.0	0.1
EPA	0	0	0.0	0.0	5700	6400	12.3	1.6	5700	6400	12.3	0.2	0.2
NASA	3057	2440	-20.2	0.1	198150	204150	3.0	50.8	201207	206590	2.7	8.2	7.6
NRC	110	70	-36.4	0.0	0	0	0.0	0.0	110	70	-36.4	0.0	0.0
TOTAL	2063160.5	2308064.8	11.9	100.0	398354.2	401956.2	4.0	100.0	2461514.7	2710021	10.1	100.0	100.0
% of FY TOTAL	83.8%	85.2%			16.2%	14.8%			100.0%	100.0%			

*The FY 1999 funding reflects Congressionally appropriated funds; the FY 2000 funding reflects the amount requested in the President's FY 2000 budget submission to Congress.

**DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

ations at Erie, Pennsylvania and Williston, North Dakota.

- an increase of $9.6 million to support a total staffing level of 4,412 FTEs for the NWS as recommended in the NOAA Review.
- an increase of $1.7 million to maintain and replace critical field office equipment, provide the necessary level of training to field forecasters, and maintain centralized communication and dissemination services.
- a decrease of $2.8 million to reflect the completion of one-time activities as mandated by Congress during FY 1999, including the installation of new NOAA Weather Radio transmitters (-$1.6 million), Susquehanna River Basin Flood System (-$.6 million), Oklahoma Climate Survey (-$.4 million), and the Cooperative Institute at the University of Utah in preparation for the 2000 Olympics (-$2 million).
- an increase of $2.2 million to initiate the national implementation of the Advanced Hydrologic Prediction System beginning in the Upper Midwest and tributaries within the Ohio River basin.
- an increase of $1.0 million for WFO Maintenance over FY 1999, providing for basic facility service contracts and corrective and preventive maintenance actions at sites across the country.
- an increase of $1.5 million to ensure the continuity of observations in support of the Nation's climate record and local forecasting, through the initial replacement of obsolete rain gage recording devices and minimum/maximum temperature sensors.
- an increase of $0.6 million to provide commercial aircraft observations (ACARS) for operational use in numerical weather prediction models.
- an increase of $0.9 million to operate and maintain the NWS network of 123 NEXRAD units.
- an increase of $0.5 million to operate and maintain the NWS network of 314 ASOS units.
- an increase of $25.8 million to continue the operation and maintenance phase of the AWIPS program.

The FY 2000 net decrease of $29.7 million for the PAC Account includes:

- an increase of $2.6 million for NEXRAD acquisition costs and to support the NEXRAD product improvement initiative.
- an increase of $0.3 million for ASOS product improvement efforts for developing and testing new sensor capabilities.
- a decrease of $46.7 million for AWIPS acquisition in accordance with planned completion of the acquisition program.
- an increase of $1.2 million for the Central Computer Facility Upgrade, providing for the 2nd of four lease payments on the Class VIII supercomputer and allowing for the planned procurement of interactive computer workstations.
- an increase of $6.4 million to support the Radiosonde Replacement Network. The radiosonde network is technologically obsolete and difficult to maintain.

Environmental Satellite, Data, and Information Services

Proposed funding for FY 2000 includes an increase in the Polar-Orbiting Satellite Program of $21.1 million and an increase in the Geostationary Satellite Program of $1.5 million. These changes allow for continuation of procurements to provide the spacecraft and instruments, launch services, and ground systems necessary to assure continuity of environmental satellite coverage. The FY 2000 budget request will maintain a system of polar-orbiting satellites that obtains global data and a system of geostationary satellites that provides near-continuous observations of the Earth's western hemisphere. Funding is included for NOAA's share of the converged NOAA and Department of Defense (DOD) polar-orbiting system that will replace the current NOAA series and the DOD Defense Meteorological Satellite Program (DMSP).

A total of $4.0 million is requested to continue the Ocean Remote Sensing Program which began in FY 1995. During the next several years, NOAA will acquire data from foreign and other non-NOAA satellites that will provide measurement of ocean currents, surface winds and waves, subsurface temperature and salinity profiles, ice thickness and flows, and other marine factors.

An increase of $1.9 million is included to maintain basic mission services including maintenance and operation of satellite ground facilities; provision of satellite-derived products; and conduct of research to improve the use of satellite data.

Budgetary changes netting to a decrease of $8.8 million are included in the Environmental Data Management System subactivity. The changes include an increase in base operating funding (+$1.5 million) and an increase to fund the Cooperative Observer Network (+$1.5 million). Decreases include elimination of funding for Regional Climatic Centers (-2.8 million) and reductions in funding for Data Preservation (-$5.0 million) and the NOAA Virtual Data System (-$4.0 million).

Office of Atmospheric Research

Requested funding for FY 2000, which includes Solar-Terrestrial Services and Research, is $47.05 million–a net increase of $0.6 million from FY 1999. An upward base adjustment of $0.6 million was made to partially cover inflationary cost increases. In addition, a decrease of $1.5 million is proposed to terminate a FY 1999 add-on for incorporating wind profile data into forecast models. This decrease is offset by an increase of $1.5 million for the United States

Weather Research Program which is directed principally toward improving predictions of hurricane track, landfall, and intensity. Finally, an increase of $4.34 million dollars is proposed under Systems Acquisition in NOAA's Procurement, Acquisition, and Construction appropriation for first-year funding for GEOSTORM, which is the Administration's follow-on to the Advanced Composition Explorer satellite. The new satellite will, through the use of a solar sail, enable NOAA to double the warning lead time for geomagnetic storms headed toward Earth.

DEPARTMENT OF DEFENSE (DOD)

The DOD total budget request for FY 2000 is $664.4 million. This total represents a 43 percent increase in the funding level from FY 1999. Specific highlights for each of the military departments are described below:

United States Air Force

United States Air Force (USAF) resources for meteorological support fall under four categories: general operations, general supporting research, DMSP operations, and DMSP and National Polar-orbiting Operational Environmental Satellite System (NPOESS) supporting research. The Air Force request (including DMSP) for FY 2000 is $456.8 million.

General Operations. The operations portion of the FY 2000 budget request is $163.4 million and represents a large portion of the environmental support to the DOD. These funds will pay for weather and space environmental support to the USAF (both active duty and reserve components), the United States Army, nine unified commands, and other agencies as directed by the Chief of Staff of the Air Force. Over 4,900 people conduct these activities at over 200 worldwide locations. These people include active duty military, Air Force reservists, Air National Guard weather flight personnel, weather communications and computer specialists, and civilians. General operations fund the salaries of these people providing weather support, and the day-to-day operations and maintenance costs for the support they provide.

General Supporting Research. The FY 2000 budget request for Air Force supporting research is $22.4 million. The Air Force continues development of the Cloud Depiction and Forecast System II (CDFS II) and the Global Theater Weather Analysis and Prediction System (GTWAPS), and research and development will begin on the Tactical Weather Radar (TWR). CDFS II will expand the computer processing capability of the current CDFS at the Air Force Weather Agency (AFWA) and will build a high resolution, worldwide cloud database which will ingest and exploit all weather satellite and sensor data received at AFWA. GTWAPS will provide AFWA and the DOD a theater modeling capability to support the warfighters. A variety of other research efforts will investigate the electrodynamics of the Sun and Earth's magnetosphere, ionospheric dynamics, mesoscale meteorology, visible and infrared properties of the environment, and cloud parameterization and prediction.

DMSP Operations. Though funding for DMSP comes from the Air Force, this system is the major source of space-borne meteorological data for the military services and other high-priority DOD programs. Environmental data from DMSP sensors is also distributed to the NWS, National Environmental Satellite, Data, and Information Service (NESDIS), the Navy's Fleet Numerical Meteorology and Oceanography Center (FNMOC) and the Naval Oceanographic Office (NAVOCEANO), and AFWA according to the Shared Processing Program agreement.

The operations portion of the FY 2000 budget request is $271.9 million. The major portion of this funding is for on-orbit operations, tactical terminal maintenance, and long-haul communications. These funds also pay operations costs for one dedicated command and control facility. DMSP funds for 65 military and civilian personnel associated with the operation of, and to a much smaller extent, the procurement of the DMSP system.

DMSP and NPOESS Supporting Research. The FY 2000 budget for DMSP R&D is $21.5 million. The funds will be used for launch vehicle integration; system integration and testing; and mission sensor calibration, validation, and algorithm development efforts. The FY 2000 DOD R&D budget for NPOESS is $80.1 million. FY 2000 funds will be used for system architecture studies and independent risk reduction and technology development efforts, and to begin critical sensor and algorithm development. NPOESS is scheduled to be available in 2008 as a backup to the final launch of the NOAA polar-orbiting satellites and DMSP satellites. This system will exploit advanced hardware and software technologies to produce a more reliable, longer-lived spacecraft with greater mission capability.

United States Navy

The United States Navy FY 2000 budget request for meteorological programs is $135.4 million. The request includes $117.5 million for operational programs and $17.9 million for supporting research.

The Navy Meteorology and Oceanography (METOC) program is truly unique. Focussing support in the highly environmentally complex coastal/littoral regions around the globe, Navy METOC is required to provide an assessment of the impact of weather and ocean phenomena on weapon systems. Additionally, and just as important, Navy METOC provides for safe flight and navigation in support of Naval, joint, and combined forces operating throughout the world's oceans. This is done with a cadre of highly-trained military and civilian personnel, schooled in both the sciences and warfighting applications.

By teaming with and leveraging the efforts of other agencies and activities, Navy METOC meets these challenges in a most cost-effective manner, providing a full spectrum of products and services with only about 5 percent of the federal weather budget.

The Navy METOC program is required to provide comprehensive and integrated weather and ocean support worldwide. The Oceanographer of the Navy sponsors programs in four closely related disciplines – meteorology, oceanography, geospatial information and services, and precise time and astrometry. All are used to protect ships, aircraft, fighting forces, and shore establishments from adverse ocean and weather conditions, and to provide a decisive tactical or strategic edge by exploiting the physical environment to optimize the performance and efficiency of platforms, sensors, and weapons.

Owing to the crucial interrelationship of the oceans and the atmosphere, the Navy requires various oceanographic products to provide the requisite meteorological services. In addition to aviation and marine METOC support, the Navy provides a variety of unique services on demand, such as electro-optical, electro-magnetic and acoustic propagation models and products, METOC-sensitive tactical decision aids, and global sea ice analyses and forecasts.

Support to Navy operations is provided under the direction of the Commander Naval Meteorology and Oceanography Command located in Stennis Space Center, Mississippi. Naval METOC support starts with sensing the battlespace physical environment and culminates with weapons arriving on target and personnel operating in the battlespace without being adversely affected by physical environmental phenomena. Operational support for the Navy and Marine Corps includes the day-to-day provision of meteorological and oceanographic (METOC) products and services. As Naval operations in the littoral increase, Navy and Marine Corps METOC support is directed towards providing on-scene capabilities to personnel that directly furnish environmental data for sensor and weapon system planning and employment. These on-scene capabilities are key elements for enabling the warfighters to take advantage of the natural environment as part of battlespace management.

Navy METOC systems acquisition is accomplished through the Space and Naval Warfare Systems Command, San Diego, California. Several major METOC operations support systems are being procured or undergoing upgrades.

Navy METOC Research and Development (R&D) is cooperatively sponsored by the Oceanographer of the Navy and the Chief of Naval Research. This area is not generally system-specific; instead, Navy R&D efforts typically have applications to meteorological, oceanographic, and/or tactical systems. Navy's tabulation of budget data includes R&D funding for exploratory research, demonstration, validation, engineering, and manufacturing development.

Initiatives of the Navy and Marine Corps, under sponsorship of the Oceanographer of the Navy, transition projects from exploratory development to operational Naval systems. Such efforts include advances in the Navy's METOC forecasting capability, enhancements to communications and data compression techniques, further development and improvement of models to better predict METOC parameters in littoral regions, and an improved understanding of the impact these parameters have on sensors, weapon systems, and platform performance.

United States Army

The United States Army is requesting $36.5 million for operational support and $13.4 million in research and development in FY 2000. Operational support increases approximately $9 million over the FY 1999 expenditures, research decreases about $1.5 million from the previous year, and staffing remains unchanged. The cost increases in operational support are found mainly in the $7 million increase in systems acquisition costs from FY 1999 to FY 2000 at United States Army Europe (USAREUR), the Training and Doctrine Command (TRADOC) Meteorological Measuring Set (MMS) Profiler upgrade, and the Integrated Meteorological System (IMETS).

USAREUR estimates requirements of $1.59 million to fund weather operations during FY 2000, with $772,000 for operational support, $600,000 for systems acquisition to purchase Portable Automated Observing Systems, and $225,000 for special programs.

TRADOC has requested approximately $6.6 million for FY 2000. TRADOC will spend $1.4 million for operations support. The Artillery School at Fort Sill, Oklahoma, will receive approximately $1.1 million of these monies to conduct operational soundings, support 23 military and civilian personnel, and conduct training in the use of the AN/TMQ-41 MMS. TRADOC's budget identifies approximately $5.1 million for system acquisition in FY 2000. Development and testing costs associated with the MMS Profiler upgrade will be $5 million for FY 2000 and costs related to installation, operation and maintenance of the Automated Surface Observing System at the Aviation School will run $100,000. TRADOC will spend $860,000 in FY 2000 for special program costs related to instructors, evaluators, and operators at the Artillery and Aviation Schools.

The IMETS Program continued fielding of Block II systems in FY 1999 and will build additional laptop and sheltered systems in FY 2000. An IMETS budget of $7.2 million was approved to fund the completion of a total of 27 mounted Block II systems,

to fund the acquisition of desktop IMETS for theater weather teams, and for the purchase of laptop IMETS systems for special forces, transportation groups, and aviation battalion weather teams.

The Eighth United States Army estimates requirements of $1.12 million to fund weather operations during FY 2000. This request includes $680,000 for Army Artillery Meteorological (ARTYMET) operations and $448,000 for USAF weather support.

Forces Command (FORSCOM) will spend approximately $8.5 million in FY 2000 for operations support. Of this amount, $1.1 million will be spent for facilities, supplies, and travel for FORSCOM weather teams and $7.4 million will be in support of FORSCOM ARTYMET operations.

In operational support for research, development, test, and evaluation, Army Materiel Command funding for the Test and Evaluation Command (TECOM) Meteorological (MET) Teams in FY 1999 was $7.1 million at 10 ranges and sites. In FY 2000, funding increases slightly to $7.3 million and support partnering with the National Center for Atmospheric Research (NCAR) to help sustain TECOM leadership in meteorological instrumentation and data displays and for modeling and simulation efforts at Dugway Proving Grounds. In basic meteorological research, the Army Research Laboratory, Battlefield Environment Division, basic research stays about constant at near $3.6 million at Adelphi Laboratory Center, Maryland. The Army Research Office saw a small increase from $1.2 million to $1.5 million from FY 1999 to FY 2000 for basic research. The Small Business Innovative Research Program and the Defense University Research Instrumentation Program (DURIP) were provided funds for selected research projects.

Space and Missile Defense Command (SMDC) activities will require $2.8 million for operational support and $500,000 for supporting research in FY 2000. SMDC will spend $420,000 in operational support at the High Energy Laser Systems Test Facility (HELSTF) for contract services to operate and maintain the instrumentation, equipment, and facilities to support the atmospheric sciences/ meteorological mission. HELSTF will also spend approximately $26,000 in systems acquisition for repair and replacement of meteorological instrumentation and for data services. Contract support services to operate the Kwajalein Missile Range will be approximately $2.2 million for operations support and $100,000 for special weather programs in FY 2000. Supporting research activities at the Space and Missile Defense Battle Laboratory (SMDBL) will be $510,000 for FY 2000 to provide space-based weather products to the Army and joint command and control system users.

It is anticipated the FY 2000 funding for weather related environmental research efforts at United States Army Research Institute of Environmental Medicine (USARIEM) will continue at or near the FY 1999 level.

DEPARTMENT OF THE INTERIOR (DOI)

The DOI/BLM funding request for FY 2000 is $1,100,000. This figure is for meteorological operations and support of the Bureau of Land Management (BLM) remote sensing requirements for Remote Automatic Weather Station (RAWS) and Lightning Detection Programs. Normal operations and maintenance of the restructured Fire RAWS program is approximately $800,000.

The BLM optimization effort in RAWS will continue in 2000. Major efforts are underway among the Wildland Fire Agencies to consolidate our efforts in Fire Weather and National Fire Danger Rating Support. Continued optimization will take place over the next few years. Subsequent cost savings in operations costs will be used to replace aging equipment and upgrade sensor packages. Proposed changes in lightning detection operations will further reduce the out-year expenditures in this program. Coordination between DOI agencies and the USDA Forest Service regarding combined meteorological requirements for the national wildland fire support functions is ongoing. During the coming geographic area review efforts, interagency RAWS replacement coordination will continue to maximize National Fire Danger Rating System (NFDRS) sampling points and minimize the total number of systems required in the West.

DEPARTMENT OF TRANSPORTATION (DOT)

The meteorological programs for the Federal Aviation Administration, Federal Highway Administration, and the United States Coast Guard for FY 2000 are described below:

Federal Aviation Administration (FAA)

The total FAA request for aviation weather in FY 2000 is $419.8 million for both operations and supporting research; the FAA funding for FY 2000 for aviation weather was $426.4 million. The changes in the budget are reductions for operations (acquisitions and support) of $13.4 million from the appropriated $409 million to the requested $395.6 million. Funding for supporting research in FY 2000 will increase by 39 percent to almost $24.2 million.

The FAA has taken a leadership role with regard to aviation weather. The FAA is setting policy, requirements, and standards for the observation and dissemination of aviation weather data, products, information, and short-range automated warnings and forecasts. FAA's aviation weather programs are directed at improving the timeliness and accuracy of weather information provided to the aviation customer--when and where it is needed. The FAA

also supports research to improve the observation, dissemination, and forecasting of aviation weather. The end users of the resulting products include pilots, dispatchers, and air traffic controllers.

In FY 2000, system acquisitions decreases by 6.2 percent to $112.8 million. Some programs show decreases due to the system being sent to the field while some newer programs have increased. Individual system acquisition and operational programs with changes greater than $2 million are listed below:

Programs	Changes ($ Millions)
Systems Acquisition:	
Automated Surface Observing System	-9.9
Weather and Radar Processor	-9.3
Integrated Terminal Weather System	-2.5
Wind Shear Processor	8.0
Terminal Doppler Weather Radar	4.9
Stand-Alone Weather Sensors	-3.9
NEXRAD	2.1
Operations Support:	
Contract Weather Observations	-12.0
Flight Service Station Operations	8.2
Aviation Weather Research	6.8

The FY 2000 funding request for operational support decreases by $6.5 million (2.3 percent) to $278.5 million. The change reflects a large decrease for contract weather observations, modest increases for certain maintenance functions, and significant salary increases for Flight Service Station operations.

Supporting research funding increases from $17.5 million in FY 1999 to $24.2 million in FY 2000. The number of personnel expected to be engaged in FAA's aviation weather program is nearly level at 3,459.

Federal Highway Administration (FHWA)

The total FHWA request for surface transportation weather programs in FY 2000 is $2.30 million all of which will be used for supporting research and special programs. The FHWA funding for FY 1999 for surface transportation weather program was $325,000. Funding for supporting research in FY 2000 will increase by $1.95 million.

In 1999, the FHWA began documentation of road weather requirements which will serve as the basis for the majority of future work in this area. This work includes addressing the technical aspects of the road transportation system (including weather data collection, processing and dissemination) as well as the institutional challenges surrounding system implementation. These institutional challenges encompassed coordination within state and local Departments of Transportation as well as across the transportation and meteorological communities. With regard to technical areas of interest, data collection efforts will include increased coverage of road condition observations and incorporate road weather data (e.g., pavement and subsurface observations) into broader meteorological observation networks. Better processing includes the application of higher resolution weather models and the development of road condition prediction models (e.g. heat balance models) that are needed to develop the appropriate transportation weather information. In addition, surface transportation decision-makers require weather information disseminated in formats that are easily understood and in which human factors issues have already been incorporated. This need will be achieved through the development of improved road weather decision support systems. Finally, the FHWA will continue to develop outreach and training course material for program delivery, training, and promotion.

United States Coast Guard (USCG)

All of USCG's funding for meteorological programs is for operations support. For FY 2000, the requested funding level is $6 million. (The Coast Guard does not have a specific program and budget for meteorology--all meteorological activities are accomplished as part of general operations.) The Coast Guard's activities include the collection and dissemination of meteorological and iceberg warning information for the benefit of the marine community. The Coast Guard also collects coastal and marine observations from its shore stations and cutters, and transmits these observations daily to the Navy's Fleet Numerical Meteorology and Oceanography Center and NOAA's National Weather Service. These observations are used by both the Navy and NOAA in generating weather forecasts. The Coast Guard also disseminates a variety of weather forecast products and warnings to the marine community via radio transmissions. Coast Guard shore stations often serve as sites for NWS automated coastal weather stations, and the National Data Buoy Center provides logistics support in deploying and maintaining NOAA offshore weather buoys. The International Ice Patrol conducts iceberg surveillance operations and provides warnings to mariners on the presence of icebergs in the North Atlantic shipping lanes.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

All of the EPA's funding of meteorological programs is for supporting research. The anticipated funding level in FY 2000 for directed meteorological research is $6.4 million which is a 12.3 percent increase over the FY 1999 funding level. This increment is primarily due to increased attention being paid to the effect of airborne toxics and particulate matter on human health.

In addition, to promote excellence in environmental science and engineering, the EPA established a national fellowship program and substantially increased its support for investigator-initiated research grants. The increase

in funding for grants (with reliance on quality science and peer review) and for graduate fellowships (to support the education and careers of future scientists) will provide for a more balanced, long-term capital investment in improved environmental research and development.

The funding for the grants program will remain at $100 million in FY 2000. The augmented grants program will fund research in areas including ecological assessment, air quality, environmental fate and treatment of toxics and hazardous wastes, and exploratory research. The portion of these grants that will be awarded for meteorological research during FY 2000 cannot be foreseen, but it is probable that the grant awards will increase the base amount of $6.4 million listed above for directed meteorological research.

The EPA is continuing its development and validation of air quality dispersion models for air pollutants on all temporal and spatial scales as mandated by the Clean Air Act, as amended. Research will focus on indoor, urban, mesoscale, regional, and multimedia models which will be used to develop air pollution control strategies, and human and ecosystem exposure assessments. There will be increased emphasis placed on meteorological research into regional and urban formation and transport of ozone and particulate pollution in support of the recent revisions to the National Ambient Air Quality Standards. Increased efficiency of computation and interpretation of results are being made possible by means of high performance computing and scientific visualization techniques.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

The majority of NASA's $206.6 million funding in meteorology is for supporting research. The requested funding for Earth Observing System (EOS) supporting research in FY 2000 is $176.3 million, which is virtually unchanged from the FY 1999 funding level. These funding levels are composed of the estimated meteorology share of the supporting research and analysis programs as well as EOS and Earth Probe instruments, EOS science and EOS Data and Information Systems (EOSDIS). The FY 2000 level reflects nearly an 8 percent increase in the EOS and an 11 percent decrease in the EOSDIS funding from the corresponding FY 1999 levels. The Earth Probes line for FY 2000 is nearly 5 percent higher than the FY 1999 level. An increase of nearly 6 percent is requested for the research and analysis programs as we approach launch activities in the EOS program. NASA also funds a $30.25 million program of weather-related research for aviation safety.

NUCLEAR REGULATORY COMMISSION (NRC)

The NRC requested funding is for meteorological operations. The FY 2000 request for $70,000 is reduced from the FY 1999 request, reflecting the expectation that work on the new transport and dispersion code RASCAL will be completed in the first quarter of FY 2000.

The meteorological support program in the NRC is focused primarily on obtaining and analyzing meteorological data and information to be utilized in atmospheric transport and dispersion models used in dose projections, plume pathway characterizations, and concentration estimates related to the safe operation of nuclear facilities and the protection of public health and safety and the environment. During emergencies, the primary consideration is obtaining current, accurate, and relevant meteorological information in real-time.

AGENCY FUNDING BY BUDGET CATEGORY

Table 2.2 depicts how the agencies plan to obligate their funds for meteorological operations broken down by "budget category." The two major categories are "Operations Support" and "Systems Acquisition." To a large degree, these categories correspond to non-hardware costs (Operations Support) and hardware costs (Systems Acquisition). For agency convenience in identifying small components that do not fit into these two major categories, a third category is added called "Special Programs." Programs that provide support to several government agencies such as the Air Force's DMSP are listed on a separate line.

Table 2.3 describes how the agencies plan to obligate their funds for meteorological supporting research according to budget categories. The agencies' supporting research budgets are subdivided along similar lines--Research and Development (non-hardware), Systems Development (hardware), and Special Programs (for those items that do not easily fit into the two major categories).

AGENCY FUNDING BY SERVICE CATEGORY

Table 2.4 summarizes how the agencies plan to obligate operational funds for basic and specialized meteorological services; Table 2.5 is a similar breakout for supporting research funds. Table 2.4 reveals that "basic meteorology" services require 54.2 percent of the total operational costs while aviation and general military services require 27.2 percent and 14.6 percent, respectively. The remaining 4 percent is distributed among the other specialized services. Table 2.5 shows that supporting research funds will be distributed among the services with basic meteorology and aviation services each receiving approximately 19 percent,

TABLE 2.2 AGENCY OPERATIONAL COSTS, BY BUDGET CATEGORY

(Thousands of Dollars)

AGENCY	Operations Support		Systems Acquisition		Special Programs		Total			% of FY2000
	FY1999	FY2000	FY1999	FY2000	FY1999	FY2000	FY1999	FY2000	% CHG	TOTAL
Agriculture	12600	12600	0	0	0	0	12600	12600	0.0	0.5
Commerce/NOAA(Subtot)	624882	662576	615732	620009	15300	18397	1255914	1300982	3.6	56.4
NWS	501454	541357	150673	132315	10376	13367	662503	687039	3.7	29.8
NESDIS	106405	99456	465059	487694	3530	3636	574994	590786	2.7	25.6
OAR	3000	7390	0	0	0	0	3000	7390	146.3	0.3
NOS	7750	7750	0	0	500	500	8250	8250	0.0	0.4
NOAA Corps	6273	6623	0	0	894	894	7167	7517	4.9	0.3
Defense(Subtot)	245447	446854	129815	141975	372	411	375634	589240	56.9	25.5
Air Force	94382	104873	51653	58505	0	0	146035	163378	11.9	7.1
DMSP*	26340	210444	65576	61433	0	0	91916	271877	195.8	11.8
Navy	103310	108352	7025	9161	0	0	110335	117513	6.5	5.1
Army	21415	23185	5561	12876	372	411	27348	36472	33.4	1.6
Interior/BLM	640	940	160	160	0	0	800	1100	37.5	0.0
Transportation(Subtot)	291004.7	284475.9	120328.4	112838.7	3712.4	4318.2	415045.5	401632.8	-3.2	17.4
CG	6000	6000	0	0	0	0	6000	6000	0.0	0.3
FAA	285004.7	278475.9	120328.4	112838.7	3712.4	4318.2	409045.5	395632.8	-3.3	17.1
FHWA	------ Not Applicable ------									
EPA	------ Not Applicable ------									
NASA	2857	2000	200	440	0	0	3057	2440	-20.2	0.1
NRC	110	70	0	0	0	0	110	70	-36.4	0.0
TOTAL	1177540.7	1409515.9	866235.4	875422.7	19384.4	23126.2	2063160.5	2308064.8	11.9	100.0
% of FY TOTAL	57.1%	61.1%	42.0%	37.9%	0.9%	1.0%	100.0%	100.0%		

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 2.3 AGENCY SUPPORTING RESEARCH COSTS, BY BUDGET CATEGORY

(Thousands of Dollars)

AGENCY	Research & Development		Systems Development		Special Programs		Total			% of FY2000
	FY1999	FY2000	FY1999	FY2000	FY1999	FY2000	FY1999	FY2000	%CHG	TOTAL
Agriculture	15500	15500	0	0	0	0	15500	15500	0.0	3.9
Commerce/NOAA(Subtot)	58817	59427	8134	9570	5244	5244	72195	74241	2.8	18.5
NWS	11847	11847	6264	7700	0	0	18111	19547	7.9	4.9
NESDIS	9740	9800	0	0	0	0	9740	9800	0.6	2.4
OAR	37230	37780	1870	1870	4350	4350	43450	44000	1.3	10.9
NOS	0	0	0	0	0	0	0	0	0.0	0.0
NOAA Corps	0	0	0	0	894	894	894	894	0.0	0.2
Defense(Subtot)	88223	74077	486.2	411.2	450	720	89159.2	75208.2	-15.6	18.7
Air Force	37798	22406	0	0	0	0	37798	22406	-40.7	5.6
DMSP*	17932	21535	0	0	0	0	17932	21535	20.1	5.4
Navy	18684	17880	0	0	0	0	18684	17880	-4.3	4.4
Army	13809	12256	486.2	411.2	450	720	14745.2	13387.2	-9.2	3.3
Interior/BLM	------ Not Applicable ------									
Transportation(Subtot)	17550	26357	0	0	100	100	17650	26457	49.9	6.6
CG	------ Not Applicable ------									
FAA	17325	24157	0	0	0	0	17325	24157	39.4	6.0
FHWA	225	2200	0	0	100	100	325	2300	607.7	0.6
EPA	5700	6400	0	0	0	0	5700	6400	12.3	1.6
NASA	118300	117000	53600	56900	26250	30250	198150	204150	3.0	50.8
NRC	------ Not Applicable ------									
TOTAL	304090	298761	62220.2	66881.2	32044	36314	398354.2	401956.2	0.9	100.0
% of FY TOTAL	76.3%	74.3%	15.6%	16.6%	8.0%	9.0%	100.0%	100.0%		

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 2.4 AGENCY OPERATIONAL COSTS, BY SERVICE

(Thousands of Dollars)

AGENCY	Basic Meteorology FY1999	Basic Meteorology FY2000	Aviation FY1999	Aviation FY2000	Marine FY1999	Marine FY2000	Agriculture & Forestry FY1999	Agriculture & Forestry FY2000	General Military FY1999	General Military FY2000	Other FY1999	Other FY2000	Total FY1999	Total FY2000
Agriculture	0	0	0	0	0	0	12600	12600	0	0	0	0	12600	12600
Commerce/NOAA(Subtot)	1193918	1232896	35596	36196	23400	24500	0	0	0	0	3000	7390	1255914	1300982
NWS	611757	634593	35596	36196	15150	16250	0	0	0	0	0	0	662503	687039
NESDIS	574994	590786	0	0	0	0	0	0	0	0	0	0	574994	590786
OAR	0	0	0	0	0	0	0	0	0	0	3000	7390	3000	7390
NOS	0	0	0	0	8250	8250	0	0	0	0	0	0	8250	8250
NOAA Corps	7167	7517	0	0	0	0	0	0	0	0	0	0	7167	7517
Defense(Subtot)	17873	18745	177175	196032	29919	31379	0	0	144284	336413	6383	6671	375634	589240
Air Force	0	0	146035	163378	0	0	0	0	0	0	0	0	146035	163378
DMSP*	0	0	0	0	0	0	0	0	91916	271877	0	0	91916	271877
Navy	17873	18745	30683	32181	29919	31379	0	0	26396	29477	5464	5731	110335	117513
Army	0	0	457	473	0	0	0	0	25972	35059	919	940	27348	36472
Interior/BLM	0	0	0	0	0	0	800	1100	0	0	0	0	800	1100
Transportation(Subtot)	0	0	409046	395633	6000	6000	0	0	0	0	0	0	415045.5	401632.8
CG	0	0	0	0	6000	6000	0	0	0	0	0	0	6000	6000
FAA	0	0	409046	395633	0	0	0	0	0	0	0	0	409045.5	395632.8
FHWA							------ Not Applicable ------							
EPA							------ Not Applicable ------							
NASA	0	0	0	0	0	0	0	0	0	0	3057	2440	3057	2440
NRC	110	70	0	0	0	0	0	0	0	0	0	0	110	70
TOTAL	1211901	1251711	621817	627861	59319	61879	13400	13700	144284	336413	12440	16501	2063160.5	2308064.8
% of FY TOTAL	58.7%	54.2%	30.1%	27.2%	2.9%	2.7%	0.6%	0.6%	7.0%	14.6%	0.6%	0.7%	100.0%	100.0%

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 2.5 AGENCY SUPPORTING RESEARCH COSTS, BY SERVICE

(Thousands of Dollars)

AGENCY	Basic Meteorology FY1999	Basic Meteorology FY2000	Aviation FY1999	Aviation FY2000	Marine FY1999	Marine FY2000	Agriculture & Forestry FY1999	Agriculture & Forestry FY2000	General Military FY1999	General Military FY2000	Other FY1999	Other FY2000	Total FY1999	Total FY2000
Agriculture	0	0	0	0	0	0	15500	15500	0	0	0	0	15500	15500
Commerce/NOAA(Subtot)	70570	72616	1625	1625	0	0	0	0	0	0	0	0	72195	74241
NWS	18111	19547	0	0	0	0	0	0	0	0	0	0	18111	19547
NESDIS	9740	9800	0	0	0	0	0	0	0	0	0	0	9740	9800
OAR	41825	42375	1625	1625	0	0	0	0	0	0	0	0	43450	44000
NOS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NOAA Corps	894	894	0	0	0	0	0	0	0	0	0	0	894	894
Defense(Subtot)	4383	5228	37824.2	22432.2	18684	17880	0	0	28268	29668	0	0	89159.2	75208.2
Air Force	0	0	37798	22406	0	0	0	0	0	0	0	0	37798	22406
DMSP*	0	0	0	0	0	0	0	0	17932	21535	0	0	17932	21535
Navy	0	0	0	0	18684	17880	0	0	0	0	0	0	18684	17880
Army	4383	5228	26.2	26.2	0	0	0	0	10336	8133	0	0	14745.2	13387.2
Interior/BLM	------ Not Applicable ------													
Transportation(Subtot)	0	0	17325	24157	0	0	0	0	0	0	325	2300	17650	26457
CG	------ Not Applicable ------													
FAA	0	0	17325	24157	0	0	0	0	0	0	0	0	17325	24157
FHWA	0	0	0	0	0	0	0	0	0	0	325	2300	325	2300
EPA	0	0	0	0	0	0	0	0	0	0	5700	6400	5700	6400
NASA	0	0	26250	30250	0	0	0	0	0	0	171900	173900	198150	204150
NRC	------ Not Applicable ------													
TOTAL	74953	77844	83024.2	78464.2	18684	17880	15500	15500	28268	29668	177925	182600	398354.2	401956.2
% of FY TOTAL	18.8%	19.4%	20.8%	19.5%	4.7%	4.4%	3.9%	3.9%	7.1%	7.4%	44.7%	45.4%	100.0%	100.0%

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

marine and agriculture/forestry services receiving 4.4 percent and 3.9 percent, respectively, and the remaining 45.4 percent dedicated to other services.

The definitions of specialized and basic services are described below:

Basic Services

Basic services provide products that meet the common needs of all users and include the products needed by the general public in their everyday activities and for the protection of lives and property. "Basic" services include the programs and activities that do not fall under one of the specialized services.

Specialized Meteorological Services

Aviation Services. Those services and facilities established to meet the requirements of general, commercial, and military aviation.

Marine Services. Those services and facilities established to meet the requirements of the DOC, DOD, and DOT on the high seas, on coastal and inland waters, and for boating activities in coastal and inland waters. The civil programs which are directly related to services solely for marine uses and military programs supporting fleet, amphibious, and sea-borne units (including carrier-based aviation and fleet missile systems) are included.

Agriculture and Forestry Services. Those services and facilities established to meet the requirements of the agricultural industries and federal, state, and local agencies charged with the protection and maintenance of the Nation's forests.

General Military Services. Those services and facilities established to meet the requirements of military user commands and their component elements. Programs and services which are part of basic, aviation, marine, or other specialized services are not included.

Other Specialized Services. Those services and facilities established to meet meteorological requirements that cannot be classified under one of the preceding categories; such as, space operations, urban air pollution, global climate change, and water management.

PERSONNEL ENGAGED IN METEOROLOGICAL OPERATIONS

Table 2.6 depicts agency staff resources in meteorological operations. The total agency staff resources requested for FY 2000 is 16,204. This total represents a decrease of 2.2 percent from FY 1999.

TABLE 2.6 PERSONNEL ENGAGED IN METEOROLOGICAL OPERATIONS
(Units are Full Time Equivalent Staff Years)*

AGENCY	FY 1999	FY 2000	% CHANGE	% of FY 2000 TOTAL
Agriculture	104	104	2.0	0.6
Commerce/NOAA	5,918	5,719	-3.5	35.3
Reimbursed**	200	200	0.0	1.4
Defense(Subtotal)	7,015	6,823	-2.8	42.1
Air Force	5,064	4,948	-2.3	30.9
DMSP	65	65	0.0	0.4
Navy	1,545	1,470	-5.1	9.1
Army	341	340	-0.3	2.4
Interior/BLM	8	8	0.0	0.0
Reimbursed**	4	4	0.0	0.0
Transportation (Subtotal)	3,516	3,545	0.8	21.9
CG	85	85	0.0	0.6
FAA	3,431	3,459	0.8	21.3
FHWA	0	1	100.0	0.0
EPA	0	0	0.0	0.0
NASA	0	0	0.0	0.0
NRC	1	1	0.0	0.0
TOTAL	16,566	16,204	-2.2	100.0

* Numbers of personnel are rounded to nearest whole number.
** "Reimbursed" are personnel funded by other agencies.

INTERAGENCY FUND TRANSFERS

Table 2.7 summarizes the reimbursement of funds from one agency to another during FY 1999. Agencies routinely enter into reimbursable agreements when they determine that one agency can provide the service more efficiently and effectively than the other. While specific amounts may vary from year-to-year, the pattern shown is essentially stable and reflects a significant level of interagency cooperation.

Department of Commerce. The NWS will reimburse DOT $2,500 for Alaska housing utilities. NASA will receive $60,000 for stratospheric studies. The NESDIS will transfer a total of $356.9 million to NASA for procurement and launches of polar-orbiting ($117.1 million) and geostationary ($239.8 million) satellites.

Department of Defense. The Air Force will reimburse DOC a total of $634,000 for COMET participation ($211,000), OFCM support ($140,000), and Share Processing Network ($283,000); DOE ($200,000) for Argonne Laboratories supporting research; and NSF ($200,000) for NCAR supporting research. The Navy will reimburse DOC $58,000 for basic climatological analysis and forecasting. The Army reimbursements to DOC include $557,000 to NWS for maintaining precipitation reporting stations, $35,000 to NOAA's Environmental Technology Laboratory and $60,000 to NOAA's NCDC for basic research. The Army will also reimburse the National Center for Atmospheric Research (NCAR) $11,000 for basic supporting research support and the AF Air Combat Command $60,000 for maintenance of weather systems. Finally, the United States Geological Survey will be reimbursed $362,000 for operations and maintenance of hydrologic and precipitation reporting stations.

Department of Transportation. The FAA will reimburse NOAA almost $17.404 million in FY 1999 for improvement of WSR-88D and costs associated with automated observing systems. Additionally, NOAA will receive $4.3 million for operational support associated with the WSR-88D and ASOS maintenance, the Center Weather Service Units at all Air Route Traffic Control Centers, the World Area Forecast System, for meteorology instructors at the FAA, and for studies and OFCM support

The FAA will reimburse Army a total of $93,000 for supporting research. The NOAA will receive $4.7 million for various supporting research associated with aeronautical hazards mitigation. The NASA will receive $80,000 for supporting research.

National Aeronautics and Space Administration (NASA). The Air Force will receive reimbursement of $1.0 million for observations and forecasts. NOAA will receive $20,000 for an upper air analysis and study, and the National Data Buoy Center will receive reimbursements of $120,000 for the operation of two data buoys.

Environmental Protection Agency (EPA). NOAA's Air Resources Laboratory (ARL) will be reimbursed $5.35 million for development, evaluation, and application of air quality dispersion models, and for providing meteorological expertise and guidance for EPA policy development activities.

Department of Energy (DOE). The NOAA/OAR will be reimbursed $1.6 million for the Air Resources Laboratory's Special Operations and Research Division located at the Nevada Nuclear Test Site.

Nuclear Regulatory Commission (NRC). The NRC will reimburse DOE $70,000 for technical assistance.

FACILITIES/LOCATIONS FOR TAKING METEOROLOGICAL OBSERVATIONS

Table 2.8 indicates the number of facilities/locations or platforms at which the federal agencies carry out (or supervise) the taking of various types of meteorological observations.

TABLE 2.7 INTERAGENCY FUND TRANSFERS FOR METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH

Agency Funds Transferred from:	Agency Funds Transferred to:	FY 1999 Funds ($K) Estimated or Planned Operations	Supporting Research
Commerce/NOAA	DOT/USCG	2.5	
	NASA Studies	60	
	NASA	356.9	
Defense/Air Force	DOC/OFCM	140	
	DOC/SPN	283	
	DOC/COMET		211
	DOE/Argonne		200
	NSF/NCAR		200
Defense/Navy	DOC/NOAA/NCDC	58	
Defense/Army	DOC/NOAA/NWS	557	
	DOC/NOAA/ETL		35
	DOC/NOAA/NCDC		60
	DOI/USGS	362	
	NSF/NCAR		11
	DOD/ACC	60	
Transportation/FAA	DOC/NOAA	17,404	4,703
	DOC/NOAA (Procurement)	4,300	
	DOD/USA		93
	NASA		80
NASA			
	DOD/USAF	1,000	
	DOC/NOAA/NDBC	120	
	DOC/NOAA		20
EPA	DOC/NOAA/ARL		5,350
DOE	DOC/NOAA/OAR	1,600	
NRC	DOE/ORNL/PNNL	70	

TABLE 2.8 FACILITIES/LOCATIONS FOR TAKING METEOROLOGICAL OBSERVATIONS

TYPE OF OBSERVATION/AGENCY	No. of Locations (FY 1999)
Surface, land	
Commerce (all types)	841
Air Force (U.S. & Overseas)	130
Navy (U.S. & Overseas)	37
Army (U.S. & Overseas)	32
Marine Corps (U.S. & Overseas)	13
Transportation (Flight Service Stn)	61
Transportation (Lim Aviation Wx Rptg Stn)	114
Transportation (Contract Wx Obsg Stn)	284
Transportation (Auto Wx Obsg Stn)	175
Transportation (Auto Sfc Obsg Sys, fielded)	416
Transportation (USCG Coastal)	100
Interior	470
Agriculture	1080
NASA	3
Surface, marine	
Commerce (SEAS-equipped ships)	140
Commerce (Coastal-Marine Autom Network)	65
Commerce (NOAA/NOS/PORTS)	6
Commerce (Buoys--moored)	64
Commerce (Buoys--drifting)	21
Commerce (Buoys--large navigation)	10
Commerce (Water-level gauges)	189
Navy (Ships with met personnel)	29
Navy (Ships without met personnel)	294
Transportation (USCG Ships)	70
NASA	2
Upper air, balloon	
Commerce (U.S.)	86
Commerce (Foreign, cooperative)	22
Air Force, Fixed (U.S. & Overseas)	12
Air Force, Mobile	15
Army, Fixed (U.S. & Overseas)	11
Army, Mobile	50
Navy, Fixed (U.S. & Overseas)	11
Navy, Mobile	47
Navy, Ships	29
Marine Corps, Mobile	14
NASA (U.S.)	2
Atmospheric Profilers	
Army	1
Upper air, rocket	
NASA	2
Army (U.S. & Overseas)	1
Doppler weather radar (WSR-88D) sites	
Commerce (NWS)	123
Air Force (U.S. & Overseas)	29
Army (U.S. & Overseas)	2
Transportation	12
Doppler weather radar (Not WSR-88D) sites	
Air Force (Transportable)	4
Navy (Fixed)	10
Marine Corps (Mobile)	9
Off-site WSR-88D Processors (PUPs)	
Commerce (NWS)	63
Air Force	140
Navy	24
Army	9
Marine Corps	9
Transportation	25
Airport terminal Doppler weather radars	
Transportation (Commissioned)	3
Army (not airfield--Test Range)	1
Conventional radar (non-Doppler) sites	
Commerce (NWS)	31
Commerce (at FAA sites)	27
Air Force, Fixed (U.S. & Overseas)	7
Air Force, Remote Displays	2
Air Force, Mobile Units	3
Army (Overseas)	1
Marine Corps, Mobile units	15
Weather reconnaissance (No. of aircraft)	
Commerce (NOAA)	3
Air Force Reserve Command (AFRC)	10
Geostationary meteorological satellites (No. operating)	
Commerce (planned config of 2)	2
Army (U.S. & Overseas)	1
Polar meteorological satellites (No. operating)	
Commerce (planned config of 2)	2
Air Force	4
Army (U.S. & Overseas)	1
Navy	(1 in orbit, status TBD)