SECTION 2

RESOURCE INFORMATION AND AGENCY PROGRAM UPDATES

The tables in this section summarize budgetary information of the federal government for Fiscal Years 2000 and 2001. 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 2000 and are subject to later changes. The data for FY 2001 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 Fiscal Year (FY) 2000 based on Congressional appropriations, the budget request for FY 2001, the percent change, and the individual agencies' percent of the total federal funding for FY 2001 and FY 2001.

DEPARTMENT OF AGRICULTURE (USDA)

The USDA budget request for FY 2001 is $28.1 million for operations and supporting research and represents no change from FY 2000. 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 2001 total congressional request of $1.44 billion for meteorological programs represents an increase of 8.3 percent over the FY 2001 appropriated funds.

NOAA's FY 2001 operations and supporting research requests for major line-office activities are described below:

Weather Services

Mission. The National Weather Service (NWS) provides weather, water, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.

Introduction. America's vulnerability to weather-related hazards is rising as more of the population moves into weather harm's way and national and global economies become more complex. Approximately 40 percent of all Americans, some 100 million people, currently reside in areas of high risk to natural disasters, with the number climbing yearly. Today, 90 percent of all presidentially declared disasters are weather and flood related. Moreover, water resources are the lifeblood of the economy and our standard of living. During the next century, weather will continue to impact our lives and significantly impact the United States economy. In recognition of this fact, the NWS was recognized by National Partnership for Reinventing Government (NPR) as one of thirty-two high impact federal agencies. By working with our partners, especially the private sector and emergency management community, NWS is striving to ensure our products and services are responsive to the needs of the American public.

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

(Thousands of Dollars)

AGENCY	Operations			% of FY2001	Supporting Research			% of FY2001	Total			% of FY2000	% of FY2001
	FY2000	FY2001	%CHG	TOTAL	FY2000	FY2001	%CHG	TOTAL	FY2000	FY2001	%CHG	TOTAL	TOTAL
Agriculture	12600	12600	0.0	0.6	15500	15500	0.0	3.6	28100	28100	0.0	1.1	1.0
Commerce/NOAA(Subtot)	1243121	1349401	8.5	60.2	88520	92599	4.6	21.2	1331641	1442000	8.3	53.3	53.9
NWS	656942	713232	8.6	31.8	19583	23054	17.7	5.3	676525	736286	8.8	27.1	27.5
NESDIS	565122	612644	8.4	27.3	10319	11585	12.3	2.7	575441	624229	8.5	23.0	23.3
OAR	3000	3152	5.1	0.1	47184	44455	-5.8	10.2	50184	47607	-5.1	2.0	1.8
NOS	10540	12950	22.9	0.6	10540	12950	0.0	3.0	21080	25900	22.9	0.8	1.0
NOAA Corps	7517	7423	-1.3	0.3	894	555	-37.9	0.1	8411	7978	-5.1	0.3	0.3
Defense(Subtot)	384178	440609.8	14.7	19.7	91546	90505.1	-1.1	20.8	475724	531114.9	11.6	19.1	19.8
Air Force	169233	184831	9.2	8.2	35714	33184	-7.1	7.6	204947	218015	6.4	8.2	8.1
DMSP**	55769	81944	46.9	3.7	21207	25372	19.6	5.8	76976	107316	39.4	3.1	4.0
Navy	123489	124797	1.1	5.6	18457	18706	1.3	4.3	141946	143503	1.1	5.7	5.4
Army	35687	49037.8	37.4	2.2	16168	13243.1	-18.1	3.0	51855	62280.9	20.1	2.1	2.3
Interior/BLM	1100	1100	0.0	0.0	0	0	0.0	0.0	1100	1100	0.0	0.0	0.0
Transportation(Subtot)	416849.1	433242.2	3.9	19.3	25561.9	32341.8	26.5	7.4	442411	465584	5.2	17.7	17.4
CG	6000	6000	0.0	0.3	0	0	0.0	0.0	6000	6000	0.0	0.2	0.2
FAA	410849.1	427242.2	4.0	19.1	22536.9	30341.8	34.6	7.0	433386	457584	5.6	17.4	17.1
FHWA	0	0	0.0	0.0	3025	2000	-33.9	0.5	3025	2000	-33.9	0.1	0.1
EPA	0	0	0.0	0.0	6400	6400	0.0	1.5	6400	6400	0.0	0.3	0.2
NASA	3888	3960	1.9	0.2	207250	198650	-4.1	45.6	211138	202610	-4.0	8.5	7.6
NRC	180	117	-35.0	0.0	0	0	0.0	0.0	180	117	-35.0	0.0	0.0
TOTAL	2061916.1	2241030	8.7	100.0	434777.9	435995.9	4.0	100.0	2496694	2677025.9	7.2	100.0	100.0
% of FY TOTAL	82.6%	83.7%			17.4%	16.3%			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.

The FY 2001 Budget Request supports the funding and program requirements to enable the NWS to better use science to serve our citizens and fulfill its vision of becoming America's "no surprise" weather service. This vision states that the NWS will produce and deliver forecasts you can trust when you need them most, use cutting-edge technologies, provide services in a cost-effective manner, strive to eliminate weather-related fatalities, and improve the economic value of weather information. In FY 2001, the NWS will continue its mission of providing weather and flood warnings and forecasts to the public and improve the overall warning lead times for tornadoes, severe thunderstorms, and flash floods, as well as improve the accuracy of hurricane landfall predictions.

The NWS contributes to three of NOAA's Strategic Plan goals: (1) Advance Short-Term Warning and Forecast Services, (2) Implement Seasonal to Interannual Climate Forecasts, and (3) Predict and Assess Decadal to Centennial Change. The NWS request also supports investments in the Natural Disaster Reduction Initiative (NDRI) as well as the NOAA Climate Observations and Services Initiative.

Budget Overview

Overall, the NOAA request includes a total of $710.2 million for the National Weather Service, a net increase of $56.3 million above the FY 2000 appropriation. The request includes a total of $634.9 million for Operations, Research, and Facilities (OR&F) and $75.4 million for Procurement, Acquisition, and Construction (PAC). In FY 2001, the budget priorities for NWS include sustaining current services, replacing obsolete observing systems, infusing new technology, and enhancing service to the Public.

Operations, Research, and Facilities.

The FY 2001 budget includes a request of $634.9 million, an increase of $33.5 million over the FY 2000 appropriation. The increase allows NWS to maintain current services in FY 2001. Specifically, the increase of $33.5 million includes $16.0 million for Mandatory Pay Raises and Inflationary Costs, $8.4 million to sustain base operations, $2.0 million for Weather Forecast Office (WFO) maintenance, $2.3 million to sustain the Co-Operative Observer (COOP) Network, $5.8 million for Advanced Weather Interactive Processing System (AWIPS) Operations and Maintenance (O&M), -$0.4 million for NEXRAD O&M, and -$0.8M for one-time program terminations. The specific details are outlined below:

- Mandatory Pay and Inflationary Costs (+$16.0M). NOAA requests an increase of $16.0 million to fund Adjustments to Base (ATBs) for NWS. The increase will fund the FY 2001 federal pay raise of 3.9 percent and annualize the FY 2000 pay raise of 4.8 percent as well as provide inflationary increases for certain non-labor activities, including service contracts, field office lease payments, and rent charges from the General Services Administration (GSA).
- Sustain NWS Base Operations (+$8.4M). NOAA requests an increase of $8.4 million to support NWS field office operations and maintain current services in FY 2001. The $8.4 million increase includes the following critical base activities:

•• Continue Weather Service Office Operations (+$.9M)--Funding is required to sustain operations at certain Weather Services Offices previously slated for closure. These offices include Ft. Smith, Arkansas; Huntsville, Alabama; Williston, North Dakota; and Erie, Pennsylvania. The offices will remain open until all necessary follow-on studies are completed and the Secretary of Commerce makes a final decision on each closure action.

•• Provide FAA/ASOS Augmentation (+$1.8M)--To comply with the FAA Observation and Aviation Service Standards, NWS is required to perform manual weather observations to augment and backup ASOS observations at certain airports across the Nation. Due to staff reductions achieved under the NWS Modernization, the workload associated with ASOS augmentation cannot be absorbed by the current NWS field office staff. The $1.8 million will provide the necessary contract support to perform the function at 17 sites.

•• Sustain NOAA Weather Radio Network (NWR) (+$3.0M)--NWS requires funding to operate and maintain 110 NWR transmitters which will be added to the network in FY 2000 and FY 2001. Current partnership agreements require the NWS to operate and maintain transmitters purchased by states and localities, the private sector, and the federal government. The NWR network is a critical for transmitting NWS warning and forecast messages to the public by providing advance notice for severe weather events.

•• Provide Network Security (+$.8M)--NWS requires funding to procure and install emergency network security hardware at the National Centers for Environmental Prediction (NCEP). The security system will prevent service interruptions from cyber and hacker attacks. NCEP receives over 25 hacker attacks per week and the number is doubling every 3 months.

•• Ensure Workplace Safety (+$.7M)--NWS requires funding to replace unsafe hydrogen generators which are used to inflate weather balloons at field offices in

Alaska. Currently, the generators present a significant safety risk to NWS employees.

•• Sustain Field Observations (+$1.2M)--NWS requires funding in FY 2001 to sustain its current suite of surface observation equipment which are critical for local weather and flood forecasting. To avoid catastrophic loss of data, NWS is planning to replace surface data collectors used to report observations from stream gages, river gages, and remote weather observation stations.

• Weather Forecast Office (WFO) Maintenance & Repair (+$2.0M). NWS requests an increase of $2.0 million for WFO Maintenance & Repair. This request will allow NWS to fund recurring maintenance contracts and address a backlog of over $7.0 million in deferred maintenance actions. WFOs require a significant investment in recurring and cyclic maintenance, including replacement of major facility support systems, such as power backup and heating, ventilation, and air conditioning (HVAC). The request will allow NWS to protect the $250 million capital investment in modernized facilities in accordance with GSA and private industry standards. In FY 2001, NWS will complete high priority repair actions at 20 field offices.

• Cooperative Observer Network (+$2.3M). NOAA requests an increase of $2.3 million to sustain the Nation's cooperative observer network. The cooperative observer network is a nationwide network of over 11,000 volunteer-operated weather observing sites used by NOAA to maintain the Nation's climate record and to provide data to local NWS field offices. In a recent report, the National Research Council recommended that NOAA take immediate steps to sustain and modernize this critical network. The instruments used to detect daily minimum and maximum temperatures as well as rain gage recording devices for measuring precipitation are virtually obsolete and increasingly costly to maintain. In FY 2001, NWS plans to begin a five-year program to modernize the entire current network. The $2.3 million will allow NWS to replace 900 rain gages and 200 temperature sensors in FY 2001.

• Advanced Hydrologic Prediction System (AHPS). In FY 2001, NOAA will also continue implementation of AHPS in the Mississippi and Ohio River Basin, focusing on high priority flood prone areas. The OR&F request includes a total of $1.0 million for this critical service improvement program. Once deployed, AHPS will significantly improve flood forecasting and water resource management by extending river stage forecasts from days to months in the future. AHPS will also provide new river forecast information which can be used by water resource and emergency managers for risk-based decision-making. AHPS will save lives and provide over $600 million in annual savings to the United States economy.

• Next Generation Weather Radar (NEXRAD) Operations & Maintenance (-$0.4M). NOAA requests a decrease of $0.4 million to provide recurring operations and maintenance for the current NWS network of 123 NEXRAD units. The NEXRAD network provides nationwide Doppler radar coverage, improving detection of severe weather and floods and increasing the warning lead time for tornadoes. This level of funding will provide for logistics, utilities, and system maintenance to ensure the operational availability of the NEXRAD network.

• Advanced Weather Interactive Processing System (AWIPS) Operations & Maintenance (+$5.8M). NOAA requests an increase of $5.8 million to provide recurring operations and maintenance for the fully deployed network of 152 AWIPS systems. FY 2001 funding is required to address recurring communications, systems obsolescence, and hardware maintenance support costs associated with build 4.2 operations.

• Automated Surface Observing System (ASOS) (+$0.02M). NOAA requests an increase of $0.02 million to operate and maintain the NWS network of 314 ASOS units. ASOS provides the weather forecaster with critical surface observations to improve weather warning and forecast services. ASOS also provides critical data to support the aviation community and climate information users.

• Procurement, Acquisition, and Construction (PAC). As indicated above, the NOAA request includes a total of $75.4 million for NWS PAC programs, an increase of $19.8 million over the FY 2000 appropriation. The specific requests are listed below:

•• NEXRAD (+$1.3M)--NOAA requests an increase of $1.3 million over the FY 2000 appropriation. In FY 2001, NWS will continue product improvement efforts by infusing new technology into the current NEXRAD radar network. The current system processor utilizes obsolete technology developed in the late 1980s. As a result, a number of new detection techniques, that are ready for operational use, cannot run on the present system. Combined with AWIPS build 5.0 technology, the NEXRAD Product Improvement (NPI) will allow NWS forecasters to improve the tornado warning lead time by 5 minutes (11 minutes

to 16 minutes) and improve the accuracy of severe storm forecasts by over 20 percent. In FY 2001, the NWS will complete hardware retrofits on a total of 50 NEXRAD radars.

- ASOS (+$1.3M)--NOAA requests an increase of $1.3 million over the FY 2000. In FY 2001, NWS will continue product improvement efforts, testing, and deploying new sensor capabilities. Specifically, NWS will replace obsolete processors on 250 ASOS systems and continue replacement of the all-weather rain gage and ice free wind sensor which are critical to aviation users.
- AWIPS (+$1.4M)--NOAA increase of $1.4 million over the FY 2000 appropriation. In FY 2001, NWS will complete the 2nd of a 3-year effort to develop and deploy AWIPS build 5.0 software. Combined with NPI technology, AWIPS build 5.0 software will allow NWS forecasters to improve the tornado warning lead time by 5 minutes (11 minutes to 16 minutes) and improve the accuracy of severe storm forecasts by over 20 percent. The NOAA request also includes funding to provide a backup Network Control Facility (NCF).
- Central Computer Facility (+$4.0M)--NOAA requests an increase of $4.0 million over the FY 2000 appropriation. The increase includes $2.0 million to operate and maintain the Class VIII supercomputer which is currently located on the Census Facility in Bowie, Maryland. The increase is necessary to provide required operations and maintenance as well as provide the necessary communications infrastructure to support the Class VIII. The increase also includes $2.0 million to obtain computing resources to improve and expand operational climate forecasts. In FY 2001, NWS is proposing to expand the current Climate Threats (Drought, Fire, Flooding) Assessment and Extreme Heat Index from 14 days to 3 months. In addition, NWS utilize additional computing capacity to improve forecasts for El Niño, La Niña, and other climate oscillations.
- Evansville, Indiana mitigation (+$5.5M)--NOAA requests an increase of $5.5 million to acquire, deploy, and install a Doppler weather radar for the Evansville, Indiana. In FY 1999, the Modernization Transition Committee (MTC) recognized a gap in radar coverage for Southern Indiana and Illinois. The MTC requested the NWS develop an action plan to address this issue before the closure certification could be finalized for the Evansville Weather Service Office.
- Radiosonde Replacement Network --NOAA will continue the replacement and modernization of the upper air radiosonde network. The PAC request includes a total of $7.0 million for this activity in FY 2001. The radiosonde network provides critical upper air observations which are the principal data source for all weather forecasts. These funds will enable NWS to exercise the first option year of the replacement systems contract to begin full deployment of the ground receiving stations, replace the remaining IBM XT microcomputers with modern PCs, continue software development, and procure surface instruments that will provide ground-based measurements at the point of balloon release.
- NOAA Weather Radio (NWR) (+$6.2M)--NOAA requests an increase of $6.2 million to upgrade and expand the NWR network to meet the Vice President's Goal of 95 percent coverage for the United States population. The NWR network is the sole government-owned and -operated radio network for the direct broadcast of weather warnings and forecasts, and other hazard information to the public. In FY 2001, NWS proposes to install 30-50 new transmitters at high priority sites across the country. In addition, NWS proposes a one-time investment of $1.7 million to improve the current NWR voice transmissions.
- NWS Weather Forecast Office (WFO) Construction--Within the overall PAC request, NOAA requests a total amount of $9.5 million to continue this critical facilities modernization program. In FY 2001, NWS will continue construction activities for the new weather office in Caribou, Maine, and Key West, Florida. In addition, NWS will continue efforts to modernize the current Alaska Tsunami Warning Center as well as replace employee housing in St. Paul, Alaska.

Environmental Satellite, Data, and Information Services

Proposed funding for FY 2001 includes an increase in the Polar-Orbiting Satellite Program of $23.4 million and an increase in the Geostationary Satellite Program of $25.2 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 2001 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 $3.3 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.

An increase of $5.5 million is requested for NOAA's lead role in the interagency Global Disaster Information Network (GDIN) and an offsetting decrease is included as the result of eliminating funds for the Global Winds Demonstration Program (-$2,3 million).

Budgetary changes netting to a decrease of $7.6 million are included in the Environmental Data Management System subactivity. The changes include an increase in base operating funding (+$2.8 million). Decreases include elimination of funding for Regional Climatic Centers (-$2.8 million) and reductions in funding for Data Preservation (-$4.2 million) and the National Coastal Ocean Data Development Center (-$3.7 million).

Office of Atmospheric Research

Requested funding for FY 2001 for Weather Research and Solar-Terrestrial Services and Research is $47.61 million--a net decrease of $2.58 million. Increases included a small base adjustment of $0.31 million to partially cover inflationary cost increases as well as a very small base restoration of $0.18 million. There also were programmatic increases of $1.0 million for the United States Weather Research Program, directed principally toward improving hurricane track predictions, and $0.1 million for the Space Weather Information Dissemination Program. Three program decreases were also requested: $1.39 million to terminate an add-on for incorporating wind profile data into forecast models, $1.85 million to terminate a second add-on for the "STORM" Program at the University of Northern Iowa, and $0.92 million to terminate a third add-on for the Radiophysics Laboratory at Dartmouth College.

DEPARTMENT OF DEFENSE (DOD)

The DOD total budget request for FY 2001 is $531.1 million. This total represents an increase of 11.6 percent in the funding level from FY 2000. 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 2001 is $325.3 million.

General Operations. The operations portion of the FY 2001 budget request is $184.8 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 2001 budget request for Air Force supporting research is $33.2 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 2001 budget request is $81.9 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 66 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 2001 budget for DMSP R&D is $25.4 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 2001 DOD R&D budget for NPOESS is $76.7 million. FY 2001 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 2001 budget request for meteorological programs is $143.5 million. The request includes $124.8 million for operational programs and $18.7 million for supporting research.

The Navy Meteorology and Oceanography (METOC) program is truly unique. Focusing 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, 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 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 basic research, applied research, demonstration and validation, and 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 $49.04 million for operational support and $13.2 million in research and development in FY 2001. Operational support increases approximately $12.4 million over the FY 2000 expenditures, research decreases about $2.9 million from the previous year, and staffing increases slightly. The cost increases in operational support are found mainly in the $13 million increase in systems acquisition costs from FY 2000 to FY 2001 at Army Materiel Command.

United States Army Europe estimates requirements of $2.9 million to fund weather operations during FY 2001, with $2.66 million going for operational support, $240,000 for special programs.

Training and Doctrine Command (TRADOC) has requested approximately $1.6 million for FY 2001. TRADOC will spend $1.47 million for operations support and $86,000 in FY 2001 for special programs costs related to instructors, evaluators, and operators at the Artillery, Aviation, and Intelligence Schools. The Artillery School at Ft. Sill will receive approximately $1.1 million of these monies to conduct operational soundings, support 24 military and civilian personnel, and to conduct training using the AN/TMQ-41 Meteorological Measuring Set (MMS).

Army Materiel Command will request a total of $34.3 million for FY 2001. $11.3 million will go for research and development and $23 million for systems acquisition. Developmental and testing costs associated with the MMS Profiler were $5.2 million in FY 2000 and will be $4.8 million in FY 2001. The Communications Electronics Command (CECOM) will spend $11.2 million to buy additional MMS's for the National Guard in FY 2001. The IMETS continued fielding of Block II systems in FY 2000. An IMETS budget of $7.02 million was approved to fund the completion of a total of 27 mounted systems and initiate development of an IMETS Light Configuration. In basic meteorological research the Army Research Laboratory, Battlefield Environment Division, basic research stays about constant at near $3.6 million. The Army Research Office saw a small decrease from $1.36 million to $1.15 million from FY 2000 to 2001 for basic research. The Small Business Innovative Research Program and the Defense University Research Instrumentation Program (DURIP) were provided funds for selected research projects. Last year's input for AMC inadvertently included research personnel in the agency personnel listings. This year's tables have been corrected to reflect the actual number of operations personnel.

The Eighth United States Army estimates requirements of $1.32 million to fund weather operations during FY 2001. This includes $710,000 for Army ARTYMET operations, $5,000 for the upgrade and maintenance of new FALOP systems, $80,000 for the purchase of new automated COTS observing systems for the DMZ area, and $520,000 for USAF weather support.

Forces Command will spend approximately $8.05 million in FY 2001 for Operations Support. Of this amount, $0.46 million will be spent for facilities, supplies, and travel for FORSCOM weather teams and $7.58 million will be in support of FORSCOM ARTYMET operations.

Space and Missile Defense Command (SMDC) activities will require $2.8 million for operational support and $0.5 million for supporting research in FY 2001. 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 $0.1 million for special weather programs for FY 2001. Supporting research activities at the Space and Missile Defense Battle Laboratory (SMDBL) will be $0.35 million for FY 2001 to provide post-Advanced Warfighting Experiment analysis and documentation.

The United States Army Special Operations Command (USASOC) provides Army funding, traditionally through a command level Unfunded Requirement (UFR), to the 10th Combat Weather Squadron (10 CWS) for operations and maintenance of equipment used by Special Operations Weather Teams (SOWTs) providing weather support to USASOC Major Subordinate Commands. The FY 2000 UFR was $115,000. $115,000 is planned to support the FY 2001 weather requirements as well.

It is anticipated that FY 2001 funding for weather-related environmental research efforts at United States Army Research Institute of Environmental Medicine (USARIEM) will continue at or near the FY 2000 level.

DEPARTMENT OF THE INTERIOR (DOI)

The DOI funding request for FY 2001 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 beginning this year. (This amount includes per-

sonnel, vehicles, per diem, normal procurement, and facilities).

The BLM optimization effort in RAWS will continue in 2001. 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 operational cost savings will be used to replace aging equipment and upgrade sensors 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 2001 are described below:

Federal Aviation Administration (FAA)

The FAA request for aviation weather in FY 2001 is $457.6 million for both operations and supporting research; the FY 2000 funding was $433.4 million. The changes in the budget are increases for operations (acquisition and operational support) of $10.9 million to $427.2 million. Also, supporting research has increases of $7.8 million to $30.3 million.

In FY 2001, system acquisitions increases by 9.7 per cent to $122.6 million. This change is a mix of new systems coming on in their procurement while some other programs are decreasing as they are fielded and leave the acquisition process. Individual programs with changes greater than $2 million are listed below:

Programs	Changes ($ Millions)
Systems Acquisition:	
Operational and Supportability Implementation System (OASIS)	15.7
Weather and Radar Processor (WARP)	9.6
Terminal Doppler Weather Radar (TDWR)	-4.2
New Generation Runway Visual Range (NGRVR)	-3.3
Operations Support:	
Contract Weather Observations (CWO)	-11.3
Flight Service Stations	6.3
ASOS Maintenance	6.0
Weather Message Switching Center (WMSC)	2.5
Aviation Weather Research	8.5

The request for funding in FY 2001 increases by $7.3 million to $300.1 million. The change reflects a large decrease in costs for CWOs and large increases in manpower salaries. Other changes are smaller and reflect normal adjustment to support costs both up and down.

Federal Highway Administration (FHWA)

The total FHWA request for surface transportation weather programs in FY 2001 is $2.3 million all of which will be used for supporting research and special programs.

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 2001, 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 gener-

ating 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 2001 for directed meteorological research is $6.4 million which is the same as the FY 2000 funding level, which was a 13 percent increase over the FY-1999 level. This level was incremented in FY 2000 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 2001. 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 2001 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)

Nearly all of NASA's funding in meteorology is for supporting research. The requested funding for supporting research in FY 2001 is $163 million, which is nearly 5 percent lower than the FY 2000 funding level. These funding levels are composed of the estimated meteorology share of the supporting research and analysis programs as well as Earth Observing System (EOS) and Earth Probe instruments, EOS science, and the EOS Data Information System elements of the NASA Office of Earth Science budget.

The Earth Science Enterprise has articulated a set of science questions which its observational programs and research, modeling, and analysis activities are directed at answering. NASA plans to meet its immediate commitments and ensure the success of the EOS Terra, AQUA, AURA and IceSAT missions. In addition, NASA is committed to deliver of a functioning data and information system to support the processing, archival, and distribution of data products from these missions. In the Earth Probes program, increased requirements are funded to reflect the rephasing which is consistent with the selection of the Earth System Science Pathfinder (ESSP) Cloudsat and Picasso-Cena missions and the impacts associated with changing the launch vehicle for the Vegetation Canopy Lidar mission. NASA is also trying to establish a healthy and viable Science program to take full advantage of the satellites that will be launched this year and the remaining 16 that will be built and launched during the next four years. In addition to ensuring a robust science program, this budget maintains a vigorous Advanced Technology program that supports development of key technologies to enable NASA's mid-term and long-term science missions. In addition to the baseline technology program, which includes the New Millennium Program (NMP), Instrument Incubator Program (IIP), and High Performance Computer and Communications (HPCC), an Advanced Technology Initiative (ATI) will identify and invest in critical instrument, spacecraft, and information system technologies. This budget increases emphasis on a viable Applications, Commercial, and Education program that bridges the focused Research and Analysis and mission science investments with the Applications and Commercial Remote Sensing Program towards addressing key environmental problems of societal relevance. NASA also funds a $35.25 million program of weather-related research for aviation safety.

NUCLEAR REGULATORY COMMISSION (NRC)

The NRC requested funding is for meteorological operations. The FY 2001 request for $117,000 is reduced from the FY 2000 request, reflecting the expectation that work on RASCAL v3.0 will be completed in the third 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. Obtaining current, accurate, and relevant meteorological information on a real-time basis for use during emergencies is the primary consideration. In addition, the data may be used to provide input to the assessment of the radiological impacts of routine airborne releases from facilities and the assessment of the potential radiological impacts of engineering changes in plant design or operation proposed by licensees should unplanned releases occur. The NRC also maintains an interest in the transport and dispersion of airborne, hazardous non-radioactive materials and their potential effects on the safe operation of nuclear facilities.

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 the distribution of operational funds: basic meteorology services receiving 58.2 percent; aviation, marine, general military services accounting for 30.6 percent, 3.2 percent, and 6.9 percent, respectively; and other specialized services and agriculture/forestry each receiving 0.6 percent. Table 2.5 shows the distribution of supporting research funds among the services with aviation meteorology receiving 23 percent, basic meteorology receiving 19.1 percent, marine and general military meteorology receiving about 7 percent, agriculture and forestry meteorology receiving 3.6 percent, and the remaining 39.4 percent dedicated to other meteorological 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.

TABLE 2.2 AGENCY OPERATIONAL COSTS, BY BUDGET CATEGORY

(Thousands of Dollars)

AGENCY	Operations Support		Systems Acquisition		Special Programs		Total			% of FY2001 TOTAL
	FY2000	FY2001	FY2000	FY2001	FY2000	FY2001	FY2000	FY2001	% CHG	
Agriculture	12600	12600	0	0	0	0	12600	12600	0.0	0.6
Commerce/NOAA(Subtot)	644761	675503	579948	655144	18412	18754	1243121	1349401	8.5	60.2
NWS	523352	550005	124092	150701	9498	12526	656942	713232	8.6	31.8
NESDIS	102316	103303	455856	504443	6950	4898	565122	612644	8.4	27.3
OAR	3000	3152	0	0	0	0	3000	3152	5.1	0.1
NOS	9470	12175	0	0	1070	775	10540	12950	22.9	0.6
NOAA Corps	6623	6868	0	0	894	555	7517	7423	-1.3	0.3
Defense(Subtot)	273676	278867.8	109866	161046	636	696	384178	440609.8	14.7	19.7
Air Force	108473	116290	60760	68541	0	0	169233	184831	9.2	8.2
DMSP*	18171	13438	37598	68506	0	0	55769	81944	46.9	3.7
Navy	122651	123922	838	875	0	0	123489	124797	1.1	5.6
Army	24381	25217.8	10670	23124	636	696	35687	49037.8	37.4	2.2
Interior/BLM	940	940	160	160	0	0	1100	1100	0.0	0.0
Transportation(Subtot)	298732.6	306075.1	111656	122549	6460.5	4618.1	416849.1	433242.2	3.9	19.3
CG	6000	6000	0	0	0	0	6000	6000	0.0	0.3
FAA	292732.6	300075.1	111656	122549	6460.5	4618.1	410849.1	427242.2	4.0	19.1
FHWA					------ Not Applicable ------					
EPA					------ Not Applicable ------					
NASA	3238	2675	650	1285	0	0	3888	3960	1.9	0.2
NRC	180	117	0	0	0	0	180	117	-35.0	0.0
TOTAL	1234127.6	1276777.9	802280	940184	25508.5	24068.1	2061916.1	2241030	8.7	100.0
% of FY TOTAL	59.9%	57.0%	38.9%	42.0%	1.2%	1.1%	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 FY2001 TOTAL
	FY2000	FY2001	FY2000	FY2001	FY2000	FY2001	FY2000	FY2001	%CHG	
Agriculture	15500	15500	0	0	0	0	15500	15500	0.0	3.6
Commerce/NOAA(Subtot)	63190	61774	9563	12970	15767	17855	88520	92599	4.6	21.2
NWS	11883	11954	7700	11100	0	0	19583	23054	17.7	5.3
NESDIS	10319	11585	0	0	0	0	10319	11585	12.3	2.7
OAR	40988	38235	1863	1870	4333	4350	47184	44455	-5.8	10.2
NOS	0	0	0	0	10540	12950	10540	12950	0.0	3.0
NOAA Corps	0	0	0	0	894	555	894	555	-37.9	0.1
Defense(Subtot)	91036	90005.1	410	400	100	100	91546	90505.1	-1.1	20.8
Air Force	35714	33184	0	0	0	0	35714	33184	-7.1	7.6
DMSP*	21207	25372	0	0	0	0	21207	25372	19.6	5.8
Navy	18457	18706	0	0	0	0	18457	18706	1.3	4.3
Army	15658	12743.1	410	400	100	100	16168	13243.1	-18.1	3.0
Interior/BLM	------ Not Applicable ------									
Transportation(Subtot)	25452.9	32241.8	0	0	109	100	25561.9	32341.8	26.5	7.4
CG	------ Not Applicable ------									
FAA	22536.9	30341.8	0	0	0	0	22536.9	30341.8	34.6	7.0
FHWA	2916	1900	0	0	109	100	3025	2000	-33.9	0.5
EPA	6400	6400	0	0	0	0	6400	6400	0.0	1.5
NASA	118300	119800	53700	43600	35250	35250	207250	198650	-4.1	45.6
NRC	------ Not Applicable ------									
TOTAL	319878.9	325720.9	63673	56970	51226	53305	434777.9	435995.9	0.3	100.0
% of FY TOTAL	73.6%	74.7%	14.6%	13.1%	11.8%	12.2%	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 FY2000	Basic Meteorology FY2001	Aviation FY2000	Aviation FY2001	Marine FY2000	Marine FY2001	Agriculture & Forestry FY2000	Agriculture & Forestry FY2001	General Military FY2000	General Military FY2001	Other FY2000	Other FY2001	Total FY2000	Total FY2001
Agriculture	0	0	0	0	0	0	12600	12600	0	0	0	0	12600	12600
Commerce/NOAA(Subtot)	1177870	1281453	35461	35596	26790	29200	0	0	0	0	3000	3152	1243121	1349401
NWS	605231	661386	35461	35596	16250	16250	0	0	0	0	0	0	656942	713232
NESDIS	565122	612644	0	0	0	0	0	0	0	0	0	0	565122	612644
OAR	0	0	0	0	0	0	0	0	0	0	3000	3152	3000	3152
NOS	0	0	0	0	10540	12950	0	0	0	0	0	0	10540	12950
NOAA Corps	7517	7423	0	0	0	0	0	0	0	0	0	0	7517	7423
Defense(Subtot)	21346	21590	206350	222438	35659	36066	0	0	114183	153902	6640	6614	384178	440609.8
Air Force	0	0	169233	184831	0	0	0	0	0	0	0	0	169233	184831
DMSP*	0	0	0	0	0	0	0	0	55769	81944	0	0	55769	81944
Navy	21346	21590	36647	37065	35659	36066	0	0	23197	23462	6640	6614	123489	124797
Army	0	0	470	542	0	0	0	0	35217	48495.8	0	0	35687	49037.8
Interior/BLM	0	0	0	0	0	0	1100	1100	0	0	0	0	1100	1100
Transportation(Subtot)	0	0	410849	427242	6000	6000	0	0	0	0	0	0	416849.1	433242.2
CG	0	0	0	0	6000	6000	0	0	0	0	0	0	6000	6000
FAA	0	0	410849	427242	0	0	0	0	0	0	0	0	410849.1	427242.2
FHWA							------ Not Applicable ------							
EPA							------ Not Applicable ------							
NASA	0	0	0	0	0	0	0	0	0	0	3888	3960	3888	3960
NRC	180	117	0	0	0	0	0	0	0	0	0	0	180	117
TOTAL	1199396	1303160	652660	685276	68449	71266	13700	13700	114183	153902	13528	13726	2061916.1	2241030
% of FY TOTAL	58.2%	58.2%	31.7%	30.6%	3.3%	3.2%	0.7%	0.6%	5.5%	6.9%	0.7%	0.6%	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 FY2000	Basic Meteorology FY2001	Aviation FY2000	Aviation FY2001	Marine FY2000	Marine FY2001	Agriculture & Forestry FY2000	Agriculture & Forestry FY2001	General Military FY2000	General Military FY2001	Other FY2000	Other FY2001	Total FY2000	Total FY2001
Agriculture	0	0	0	0	0	0	15500	15500	0	0	0	0	15500	15500
Commerce/NOAA(Subtot)	76355	78024	1625	1625	10540	12950	0	0	0	0	0	0	88520	92599
NWS	19583	23054	0	0	0	0	0	0	0	0	0	0	19583	23054
NESDIS	10319	11585	0	0	0	0	0	0	0	0	0	0	10319	11585
OAR	45559	42830	1625	1625	0	0	0	0	0	0	0	0	47184	44455
NOS	0	0	0	0	10540	12950	0	0	0	0	0	0	10540	12950
NOAA Corps	894	555	0	0	0	0	0	0	0	0	0	0	894	555
Defense(Subtot)	5534	5419	35784	33254	18457	18706	0	0	31371	33026.1	400	100	91546	90505.1
Air Force	0	0	35714	33184	0	0	0	0	0	0	0	0	35714	33184
DMSP*	0	0	0	0	0	0	0	0	21207	25372	0	0	21207	25372
Navy	0	0	0	0	18457	18706	0	0	0	0	0	0	18457	18706
Army	5534	5419	70	70	0	0	0	0	10164	7654.1	400	100	16168	13243.1
Interior/BLM	------ Not Applicable ------													
Transportation(Subtot)	0	0	22536.9	30341.8	0	0	0	0	0	0	3025	2000	25561.9	32341.8
CG	------ Not Applicable ------													
FAA	0	0	22536.9	30341.8	0	0	0	0	0	0	0	0	22536.9	30341.8
FHWA	0	0	0	0	0	0	0	0	0	0	3025	2000	3025	2000
EPA	0	0	0	0	0	0	0	0	0	0	6400	6400	6400	6400
NASA	0	0	35250	35250	0	0	0	0	0	0	172000	163400	207250	198650
NRC	------ Not Applicable ------													
TOTAL	81889	83443	95195.9	100471	28997	31656	15500	15500	31371	33026.1	181825	171900	434777.9	435995.9
% of FY TOTAL	18.8%	19.1%	21.9%	23.0%	6.7%	7.3%	3.6%	3.6%	7.2%	7.6%	41.8%	39.4%	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.

PERSONNEL ENGAGED IN METEOROLOGICAL OPERATIONS

Table 2.6 depicts agency staff resources in meteorological operations. The total agency staff resources requested for FY 2001 is 14,492. This total represents a decrease of less than 1 percent from FY 2001.

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

AGENCY	FY 2000	FY 2001	% CHANGE	% of FY 2001 TOTAL
Agriculture	104	104	0.0	0.7
Commerce/NOAA	5,708	5,696	-0.2	39.3
Defense(Subtotal)	5,103	5,086	-0.3	35.1
Air Force	3,316	3,334	0.5	23.0
DMSP	65	66	1.5	0.5
Navy	1,462	1,423	-2.7	9.8
Army	260	263	1.1	1.8
Interior/BLM	8	8	0.0	0.1
Reimbursed**	4	4	0.0	0.0
Transportation (Subtotal)	3,575	3,593	0.5	24.8
CG	85	85	0.0	0.6
FAA	3,489	3,506	0.5	24.2
FHWA	1	2	50.0	0.0
EPA	0	0	0.0	0.0
NASA	0	0	0.0	0.0
NRC	1	1	0.0	0.0
TOTAL	14,503	14,492	-0.1	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 2000. 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. NWS will reimburse DOT $2,500 for Alaska housing utilities. NASA will receive $60,000 for stratospheric studies. NESDIS will transfer a total of $384.6 million to NASA for procurement and launches of polar-orbiting ($98.2 million) and geostationary ($250.4 million) satellites.

Department of Defense. The Air Force will reimburse DOC a total of $787,000 for COMET participation ($372,000), OFCM support ($140,000), and Share Processing Network ($275,000); DOE ($65,000) for Argonne Laboratories supporting research; and NSF ($250,000) for NCAR supporting research. The Navy will reimburse DOC $218,000 for basic climatological analysis and forecasting, and interagency coordination. The Army reimbursements to DOC/NOAA include $571,000 to NWS for maintaining precipitation reporting stations and $260,000 to NOAA laboratories for precipitation modeling and basic research. The Army will also reimburse the AF Air Combat Command $100,000 for maintenance of weather systems. Finally, the United States Geological Survey will be reimbursed $770,000 for operations and maintenance of hydrologic and precipitation reporting stations.

Department of Transportation. The FAA will reimburse NOAA almost $19.0 million in FY 2001. Included in those funds are 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 $2.2 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 $1.875 million for surface observations/forecasts and replacement of upper air systems. NOAA's NWS will receive $12,000 for an upper air analysis; 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 receive $5.4 million for development, evaluation, and application of air quality dispersion models; and for provision of meteorological expertise and guidance for EPA policy development activities.

Nuclear Regulatory Commission (NRC). The NRC will reimburse DOE $87,000 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 2000 Funds ($K) Estimated or Planned Operations	Supporting Research
Commerce/NOAA	DOT/USCG	2.5	
	NASA Studies	60	
	NASA	348.6	
Defense/Air Force	DOC/NOAA/OFCM	140	
	DOC/SPN	275	
	DOC/COMET		372
	DOE/Argonne		65
	NSF/NCAR		250
Defense/Navy	DOC/NOAA/NCDC	58	
	DOC/NOAA/OFCM	160	
Defense/Army	DOC/NOAA/NWS	571	
	DOC/NOAA/ETL		65
	DOC/NOAA/ATDD		75
	DOC/NOAA		120
	DOI/USGS	770	
	DOD/ACC	100	
Transportation/FAA	DOC/NOAA	18,952	2,200
	DOD/USA		93
	NASA		80
NASA			
	DOD/USAF	1,875	750
	DOC/NOAA/NDBC	120	
	DOC/NOAA/NWS		12
EPA	DOC/NOAA/ARL		5,400
NRC	DOE/PNNL	87	

TABLE 2.8 FACILITIES/LOCATIONS FOR TAKING METEOROLOGICAL OBSERVATIONS

TYPE OF OBSERVATION/AGENCY	No. of Locations (FY 2000)
Surface, land	
Commerce (all types)	841
Air Force (U.S. & Overseas)	130
Navy (U.S. & Overseas)	34
Army (U.S. & Overseas)	39
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)	482
Transportation (Auto Sfc Obsg Sys, fielded)	570
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	286
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)	10
Army, Mobile	51
Navy, Fixed (U.S. & Overseas)	11
Navy, Mobile	47
Navy, Ships	29
Marine Corps, Mobile	14
NASA (U.S.)	2
Atmospheric Profilers	
Army	7
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)	3
Transportation	12
Doppler weather radar (Not WSR-88D) sites	
Air Force (Transportable)	4
Navy (Fixed)	9
Marine Corps (Mobile)	14
Off-site WSR-88D Processors (PUPs)	
Commerce (NWS)	63
Air Force	140
Navy	23
Army	9
Marine Corps	9
Transportation	25
NASA	2
Airport terminal Doppler weather radars	
Transportation (Commissioned)	41
Army (not airfield--Test Range/USAREUR)	2
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
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)