

SECTION 2

RESOURCE INFORMATION AND AGENCY PROGRAM UPDATES

The tables in this section summarize budgetary information of the Federal government for Fiscal Years 2007 and 2008. 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 September 2007 and are subject to later changes. The data for FY 2008 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) 2007 based on Congressional appropriations, the budget request for FY 2008, the percent change, and the individual agencies' percent of the total Federal funding for FY 2007 and FY 2008.

DEPARTMENT OF AGRICULTURE (USDA)

The USDA budget request for FY 2008 is \$48.8 million for operations and supporting research, representing an 11.5 percent decrease from the FY 2007 funding level. A large portion of this decline was due to a reduction in funding for supporting research. USDA has requested \$29.2 million for research and development programs, a \$6.8 million decrease from 2007. The FY 2008 amount requested for meteorological operations is \$19.6 million, up from \$19.1 million in FY 2007.

Operational activities include specialized weather observing networks such as the SNOTEL (SNOW pack TELemetry) system operated by the Natural Resources Conservation Service (NRCS) and the remote automated weather stations (RAWS) network managed by the Forest Service. The SNOTEL and RAWS networks provide cooperative data for NOAA's river forecast activities, irrigation water supply estimates, and Bureau of

Land Management operations. The Forest Service is also the world leader in developing emissions factors from fires and modeling its dispersion. The USDA and the Department of Commerce (DOC) jointly operate a global agricultural weather and information center located in Washington, D.C. This Joint Agricultural Weather Facility operationally monitors global weather conditions and assesses the impacts of growing season weather on crop and livestock production prospects. This information keeps crop and livestock producers, farm organizations, agribusinesses, state and national farm policy-makers, government agencies, and foreign buyers of agricultural products apprised of worldwide weather-related developments and their effects on crops and livestock. Furthermore, tracking weather and crop developments in countries that are either major exporters or importers of agricultural commodities keeps the agricultural sector informed on potential competitors. USDA is also actively involved in drought monitoring efforts in concert with the National Drought Mitigation Center.

For supporting research, USDA funds research projects through the Cooperative State Research, Education and Extension Service (CSREES) that study the impact of climate and weather on food and fiber production. 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. Furthermore, the Agricultural Research Service (ARS) conducts research on how annual variation in weather adversely affects crop and animal production, hydrologic processes, the availability of water from watersheds, and the environmental and economic sustainability of agricultural enterprises.

DEPARTMENT OF COMMERCE (DOC)

WEATHER SERVICES

The National Weather Service (NWS) provides weather, hydrologic, 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 government agencies, the private sector, the public, and the global community.

More and more sectors of the U.S. economy recognize the impacts of weather, water, and climate on their businesses, and are becoming more sophisticated at using weather, water, and climate information to make better

TABLE 2.1 METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH COSTS*, BY AGENCY
(Thousands of Dollars)

AGENCY	Operations		% of FY2008		Supporting Research		% of FY2008		Total		% of FY2008	
	FY2007	FY2008	%CHG	TOTAL	FY2007	FY2008	%CHG	TOTAL	FY2007	FY2008	%CHG	TOTAL
Agriculture	19107	19563	2.4	0.6	35982	29216	-18.8	3.9	55089	48779	-11.5	1.3
Commerce/NOAA(Subtot)	1857125	1871181	0.8	61.5	112253	99298	-11.5	13.4	1969378	1970479	0.1	52.7
NWS	861887	880891	2.2	28.9	22505	22601	0.4	3.1	884392	903492	2.2	23.7
NESDIS***	953411	950437	-0.3	31.2	29854	27871	-6.6	3.8	983265	978308	-0.5	26.3
OAR	0	0	0	0.0	58238	47170	-19.0	6.4	58238	47170	-19.0	1.6
NOS	28337	26363	-7.0	0.9	500	500	0.0	0.1	28837	26863	-6.8	0.8
NMAO	13490	13490	0.0	0.4	1156	1156	0.0	0.2	14646	14646	0.0	0.4
Defense(Subtot)	552218	665728	20.6	21.9	419854	404187	-3.7	54.6	972072	1069915	10.1	26.0
Air Force***	312926	326868	4.5	10.7	383135	374618	-2.2	50.6	696061	701486	0.8	18.6
DMSP**	101289	145146	43.3	4.8	963	0	-100.0	0.0	102252	145146	41.9	2.7
Navy	72653	87370	20.3	2.9	24335	18910	-22.3	2.6	96988	106280	9.6	2.6
Army	65350	106344	62.7	3.5	11421	10659	-6.7	1.4	76771	117003	52.4	2.1
Homeland Security (Subtot)	20110	21540	7.1	0.7	0	0	0.0	0.0	20110	21540	7.1	0.5
USCG	20110	21540	7.1	0.7	0	0	0.0	0.0	20110	21540	7.1	0.5
Interior/BLM	2400	2400	0.0	0.1	0	0	0.0	0.0	2400	2400	0.0	0.1
Transportation(Subtot)	518335	462117	-10.8	15.2	27800	32514	17.0	4.4	546135	494631	-9.4	14.6
FAA	518335	462117	-10.8	15.2	23600	28314	20.0	3.8	541935	490431	-9.5	14.5
FRA	0	0	0.0	0.0	0	0	0.0	0.0	0	0	0.0	0.0
FHWA	0	0	0.0	0.0	4200	4200	0.0	0.6	4200	4200	0.0	0.1
EPA	0	0	0.0	0.0	9000	9000	0.0	1.2	9000	9000	0.0	0.2
NASA	2423	2389	-1.4	0.1	162700	166400	2.3	22.5	165123	168789	2.2	4.4
NRC	120	120	0.0	0.0	0	0	0.0	0.0	120	120	0.0	0.0
TOTAL	2971838	3045038	2.5	100.0	767589	740615	-3.5	100.0	3739427	3785653	1.2	100.0
% of FY TOTAL	79.5%	80.4%			20.5%	19.6%			100.0%	100.0%		100.0

*The FY 2007 funding reflects Congressionally appropriated funds; the FY 2008 funding reflects the amount requested in the President's FY 2008 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.

***NESDIS and Air Force budget numbers include the DOC and DOD shares of the NPOESS budget, respectively.

decisions. To meet this growing demand for information and to improve the timeliness and accuracy of warnings for all weather related hazards, the NWS will continue to enhance observing capabilities, improve data assimilation to effectively use all the relevant data NWS and others collect, improve collaboration with the research community, make NWS information available quickly, efficiently, and in a useful form (e.g., the National Digital Forecast Database) and include information on forecast uncertainty to help customers make fully informed decisions.

With about 4,700 employees in 122 weather forecast offices (WFO), 13 river forecast centers, 9 national centers and other support offices around the country, NWS provides a national infrastructure to gather and process data worldwide from the land, sea, and air.

The FY 2008 President's Budget Request supports the funding and program requirements necessary to address established NOAA strategic goals and sets NWS on a path to achieve its vision: *Produce and deliver forecasts that can be trusted; use cutting-edge technologies; provide services in a cost-effective manner; strive to eliminate weather related fatalities; and improve the economic value of weather, water, and climate information.*

NOAA requests a total of \$903,492,000 million and 4,658 FTE to support the continued and enhanced operations of the National Weather Service. The total includes \$16,130,000 for Adjustments to Base, and net program changes of \$2,329,000 for program increases.

ADJUSTMENTS TO BASE

NOAA requests a net increase of \$18,297,000 and 0 FTE to fund adjustments to base across all accounts in the National Weather Service activities. With this increase, program totals will

fund the estimated FY 2008 Federal pay raise of 3.0 percent and annualize the FY 2007 pay raise of 2.2 percent. Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration.

NWS also requests the following transfers between line offices or appropriations for a net change to NOAA of zero:

- \$3,270,000 is transferred from the NOAA Profiler Network PPA of Operations, Research, and Facilities to the NOAA Profiler Conversion PPA of Procurement, Acquisition, and Construction. This transfer has no net effect on overall NWS or NOAA funding and was done to reflect the accurate activity of the funds within the program.

- \$7,347,000 and 51 FTEs are transferred from the Space Weather Prediction Center (formally the Space Environment Center) to the Local Warnings and Forecast Base PPA within the Local Warning and Forecast line. This transfer has no net effect on overall NWS funding.

NWS - ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2008:

NOAA requests a net increase of \$8,334,000 and 0 FTE over the FY 2008 base for a total request of \$807,807,000 and 4,627 FTE. These changes are summarized at the subactivity level below and to be concise, do not include descriptions below \$1,000,000. Descriptions of each request by line item are located in the NOAA FY 2008 Technical Budget.

Operations and Research: \$711,462,000

A net increase of \$8,334,000 and 0 FTE above the base is requested in the Operations and Research subactivity, for a total of \$711,462,000 and 4,439 FTE.

Local Warnings and Forecasts. \$7,294,000 and 0 FTE in net increases above the base, for a total of \$658,214,000 and 4,133 FTE, requested under the Local Warnings and Forecasts line item of the Operations and Research subactivity.

TAO Tropical Moored Buoy Technology Refresh. NOAA requests an increase of 0 FTE and \$1,100,000 to replace obsolete components of the Nation's foremost climate observing system. Total funding required to replace obsolete components for the 55 buoys in this array is \$6.6M. This effort will be accomplished over a six year period beginning in FY 2008.

Florida/Caribbean Hurricane Data Buoy (Operation and Maintenance). NOAA requests an increase of 0 FTEs and \$3,000,000 for a total of \$4,400,000 to operate and maintain 15 weather data buoys (eight buoys funded under the FY 2006 Hurricane Supplemental Appropriation and seven funded in by the FY 2005 Hurricane Supplemental Appropriation) for enhanced real time hurricane data observations and storm monitoring in the Caribbean, Gulf of Mexico, and the Atlantic Ocean to support the NOAA hurricane warning and forecast mission

Ocean Sensor Operation and Maintenance. NOAA requests an increase of 0 FTEs and \$1,350,000 for ongoing operation and maintenance of the Congressionally mandated ocean instrumentation which was funded and installed by the National Ocean Service's "Convert Weather Buoys Initiative." These sensors augment fixed and buoy observational sites. In keeping with NOAA's commitment of increased interoperability and cost effective approach to oceanographic observing, the NOS Convert Weather Buoy project augments existing National Weather Service buoys with oceanographic sensors. This national network of weather observing buoys

has been augmented with ocean sensors to measure directional waves and wave heights, and ocean current, temperature, and salinity profiles.

Ongoing Operations and Maintenance for Systems/equipment Purchased to Meet Requirements of Hurricane Supplemental. NOAA requests 0 FTE and \$1,230,000 to pay ongoing operations and maintenance costs for Incident Meteorologist equipment, software support, and communications, ASOS and NWR backup power units, and backup communications for coastal Weather Forecast Offices and Next Generation Weather Radars.

Space Weather Prediction Center (SWPC) (formally the Space Environment Center). NOAA requests a reduction in SWPC funding of \$1,300,000 to reflect funding of higher-priority NWS requirements. This \$1,300,000 reduction will reduce SWPC model development and transition of models to operations; and eliminates outreach efforts. The \$6,261,000 funding level supports SWPC real-time monitoring and forecasting of solar and geophysical events.

Strengthening the U.S. Tsunami Warning Program. NOAA requests an increase of 0 FTE and \$1,700,000 for a total of \$23,196,000 in FY 2008, to sustain the Administration's commitment to strengthen the U.S. Tsunami Warning Network. Funds are required to operate and maintain the expanded U.S. Tsunami Detection and Warning System put in place in FY 2004-2007 and complete deployment of the DART Buoy Network.

NOAA Profiler Network Operations and Maintenance. NOAA requests an increase of 0 FTE and \$1,670,000. This \$1,670,000 increase reflects the increased operations and maintenance costs for the NPN due to the need to continue operating all but three of the 37 sites for all of FY 2008, while needing to put in place the infrastructure for operations and maintenance of the fre-

quency replacement.

US Weather Research Program (USWRP). NOAA requests a reduction in USWRP/THORPEX funding of \$1,456,000 to reflect funding of higher-priority NWS requirements. This reduction will reduce support for THORPEX, including a multi-national experiment in the North Pacific targeted to improving high impact winter weather forecasts on the U.S. Pacific Coast. This field experiment will end a grants program between NOAA and the academic community focused on accelerating 1-14 day forecasts.

Central Forecast Guidance. NOAA is requesting \$1,040,000 and 0 FTE in net increases above the base, under the Central Forecast Guidance line item of the Operations and Research subactivity.

Hurricane/Environmental Modeling Improvements. NOAA is requesting \$1,040,000 and 0 FTE for operational support and maintenance of the next-generation hurricane and storm surge prediction system. As a result of the active 2005 hurricane season, NOAA was provided hurricane supplemental funding to accelerate the next-generation hurricane and storm surge prediction system. This request provides the necessary operations and maintenance funding to support these systems on a daily, routine basis leading to improved hurricane and storm surge prediction. This environmental modeling investment is necessary support operationally the next-generation hurricane prediction system and to integrate NOAA's several environmental prediction models into a single environmental modeling prediction system to meet demands for more accurate forecast products in weather, climate, ocean and coastal ocean and ecosystems. Operational hurricane intensity and storm surge predictions at landfall will be highlighted in this effort, which will capitalize on proven research, lay the groundwork for a national prediction system meeting civil, military, and

homeland defense needs, and regain NOAA's position as a world leader in environmental prediction.

SYSTEMS OPERATION & MAINTENANCE (O&M)

NWS is requesting \$96,345,000 and 188 FTE, which is an increase of \$0 and 0 FTE to support the on going operations and maintenance of major NWS observation and processing systems. These systems include the Next Generation Weather Radar (NEXRAD), Automated Surface Observation System (ASOS), Advanced Weather Interactive Processing System (AWIPS)/NOAAPort, and the NWS Telecommunications Gateway System (NWSTG) and Backup. NWS currently operates 123 NEXRAD Systems that utilize Doppler technology and hydrometeorological processing to provide weather radar data for tornado and thunderstorm warnings, air safety, flash flood warnings, and water resource information. 315 NWS ASOS sites provide reliable 24-hour per day continuous surface weather observations. AWIPS provides an integrated system to display all hydrometeorological data at NWS field offices. The system acquires and processes data from modernized sensors and local sources, provides computational and display functions, provides interactive communication systems, and disseminates weather and flood warnings and forecasts in a rapid and highly reliable manner. NWSTG and Backup Systems are the Nation's hub for the collection and distribution of weather data and products. NWSTG and Backup provide national and global real-time exchange services using an automated communication system to collect and distribute a wide-range of environmental data such as observations, analysis, forecast, and warning products.

SYSTEMS

ACQUISITION:

\$69,081,000 and 31 FTE

Automated Surface Observing System (ASOS) (\$1,635,000)

This acquisition is a tri-agency program involving NOAA, the Department of Defense, and the Federal Aviation Administration. ASOS provides reliable, 24-hour, continuous surface weather observations. Under the product improvement portion of this acquisition program, NOAA is developing new ASOS sensor capabilities in order to meet changing user requirements and decrease maintenance demands.

Advanced Weather Interactive Processing System (AWIPS)/NOAA-Port (\$12,764,000)

AWIPS is the cornerstone of the modernized NWS. This system integrates and displays all hydrometeorological data at NWS field offices. AWIPS acquires and processes data from modernized sensors and local sources, provides computational and display functions at operational sites, provides a robust communications system to interconnect NWS operational sites, and disseminates warnings and forecasts in a rapid, highly reliable manner. This system integrates satellite, NEXRAD Doppler weather radar data, and Numerical Weather Prediction (NWP) data enabling field forecasters to better visualize environmental processes to enable the creation of timely and accurate forecasts and warnings. AWIPS provides the only display for NEXRAD Doppler weather radar data at NWS Weather Forecast Offices (WFOs) and River Forecast Centers (RFCs). The AWIPS NOAA-Port satellite broadcast network offers the communications capability to provide internal and external users with open access to much of NOAA's real-time environmental data.

Next Generation Weather Radar (NEXRAD) (\$8,376,000)

NEXRAD is a Doppler weather radar

system that provides automated signal processing, computerized data processing by sophisticated meteorological software algorithms, and a high-capacity, processor-driven communications capability. The system is modular in design, upgradeable, has a long life-cycle expectancy, and provides both governmental and commercial sector weather users with a wide array of automated weather information that will increase their capability to meet their respective operational requirements. For the NWS, the system uses Doppler technology and hydrometeorological processing to provide significant increases, both in the functional capability and in performance, compared with previous radars, including improved tornado and thunderstorm warnings, increased air safety, improved flash flood warnings, and improved water resources management.

Radiosonde Replacement Program (\$4,014,000)

The NWS radiosonde network provides upper-air weather observations; the primary source of data required by NWS numerical weather prediction models, which form the basis of all NWS forecasts for day 2 and beyond. Observations of temperature, pressure, humidity, and wind speed/direction are taken twice a day at 102 locations nationwide and in the Caribbean using a balloon-borne instrument (radiosonde) which transmits the data via radio signal to a ground receiving station usually located at a Weather Forecast Office (WFO), where it is processed.

NOAA's Environmental Real Time Observation Network (NERON) (\$4,234,000)

Funds are required to develop, & start deployment and installation of the Historical Climate Network in FY2008. NERON is a project to integrate a network of observing systems

to sustain the Nation's climate record of land surface measurements essential to monitor and assess the surface climate. NERON will modernize 1,000 of the existing 1,221 HCN stations to collect temperature and precipitation data through automation and provide for expansion to collect other data sets (e.g., National Integrated Drought Information System (NIDIS). The Historical Climate Network (HCN-M) is a subset of the National Weather Service's (NWS) Cooperative Observer Program (COOP). This long-term data set furnishes valuable information for NOAA field offices and national centers in the production of operational products for various customers. Modernizing the HCN will reduce the uncertainty in the measure of regional climate change. HCN-M will sustain the regional climate record and improve the quality of climate observations directly contributing to NOAA's capability to monitor and analyze climate change and improve the accuracy of predictions in support of planning, mitigation, and informed decisions. As part of the NERON project, the Meteorological Assimilation Data Ingest System (MADIS), a research project run by OAR/GSD in Boulder, CO, will be transitioned into operations at NWS Headquarters in Silver Spring, MD. This central data collection and processing system will provide quality control of the NERON data and other mesonet data sets, and provide distribution of data to NWS offices, NOAA's National Climate Data Center (NCDC), other Federal and state agencies, and the public. MADIS currently collects, processes, and distributes data from over 20,000 mesonet stations.

NWS Telecommunications Gateway Legacy Replacement (\$1,195,000)

The NWSTG is the NWS communications hub for collecting and distributing weather information to its field units and external users. Replacing the

NWSTG system with up-to-date technology will reduce the current delays in collecting and disseminating data by reducing transit time through the NWSTG. The replacement will ensure reliable delivery of NWS products to users and will fully capitalize on better observation data and prediction models to improve services. In FY 2008, NWS will conclude a three-year effort to replace the National Weather Service Telecommunications Gateway (NWSTG) switching system and repair and upgrade NWSTG facilities.

Weather and Climate Supercomputing (\$19,092,000)

The cyclical upgrade of the NWS weather and climate supercomputing capability is intended to procure the computing and communications equipment needed to receive and process the increasing wealth of environmental data acquired by modernized observing systems, process improved and more sophisticated numerical weather prediction models, and stay current with the supercomputing technology the market has to offer. Execution of this program promotes public safety and the protection of property by providing the NCEP with the computer systems that are capable of producing more accurate NWS climate and numerical weather prediction (NWP) guidance products for hurricanes, severe thunderstorms, floods, and winter storms. Additionally, the supercomputing system more accurately forecasts large-scale weather patterns in the medium (3 to 10 days) and extended range (30 days), plus forecasts of major climate events such as El Niño and La Niña. In addition, the computer upgrades will improve the delivery of products to the field and provide system users with enhanced productivity. These products and services will lead to significant economic benefits for users, like the agriculture, construction, and transportation industries.

Weather Supercomputing Backup (\$7,077,000)

The backup supercomputer system is a clone of the primary supercomputer system and located in an offsite facility. The backup system is used to thoroughly test pre-Production weather and climate forecasting applications when it is not being used to run the Production Suite during a backup system test or actual emergency. The backup supercomputer system is capable of handling 100 percent of the operational workload should the primary supercomputer system be disrupted. Implementation and maintenance of a redundant Weather and Climate Operational Supercomputer Systems architecture will ensure uninterrupted flow of essential weather and climate data and products, continuity of storm watch and warning services to the public, and compliance with NOAA Critical Infrastructure Protection (CIP) plans.

Complete and Sustain NOAA Weather Radio (NWR) (\$5,594,000)

Continue refurbishment of four hundred (400) stations established in the 1970s, eliminating single points of failure and improving network reliability. NWR was designed to be and is used as a reliable, inexpensive means of communicating weather related warnings to the public. The existing infrastructure of NWR has tremendous potential for use communicating warnings and information about non-weather related hazards and emergencies. NOAA has had extensive meetings with the Department of Homeland Security, discussing the use of NWR as an all hazards warning system. National Weather Service received an appropriation of \$5.4M in FY 2004 to make NWR an all hazard warning network. NWR infrastructure as a national warning network consists of over 900 existing broadcast stations; broadcast coverage that reaches 97 percent of the nation's population; and

the ability to deliver the broadcasted message to individuals monitoring their own NWR receivers as well as the ability to reach millions of listeners and viewers since NWR signal enters the Emergency Alert System, which is monitored by television and radio license holders.

NOAA Profiler Conversation. (\$5,100,000)

The conversion provides funding to modify the transmitting frequency and provide technology refresh the Wind Profilers system installed in 1988. The Wind Profiler is a vertical looking radar that provides input for numerical weather models that predict clouds, precipitation, and temperature. The data also provides important indicators of where severe weather such as tornadoes and winter storms may form and is used for issuing aviation advisories and wildfire predictions. Currently, 32 of the 37 are using an experimental transmitter frequency of 404 megahertz (MHz) issued by the National Telecommunications and Information Administration (NTIA). NTIA has permanently assigned this frequency to a series of search and rescue satellites and granted the Profilers a permanent frequency of 449 MHz. NWS must complete the conversion prior to the launch of the first satellites in FY 2008.

CONSTRUCTION: \$26,604,000

NOAA requests a decrease of \$5,205,000 and 0 FTE for a total of \$14,100,000 to complete the NOAA Center for Weather and Climate Prediction (NCWCP) for FY 2008 occupancy and operations.

This FY 2008 decrease is consistent with the planned NCWCP investment profile to begin occupancy of the building by February 2008, and complete the move from the World Weather Building (WWB) to NCWCP by October 2008. This funding includes implementing mission critical systems

overlap during the transition/move. NOAA must complete the purchase and installation and checkout of IT equipment, systems furniture, and other government furnished equipment, hire movers and pay rent on the new facility. The restored funds will allow the implementation of overlap operations of 24x7 mission critical systems. This overlap operation has been planned and will be closely coordinated to ensure that data and products critical to the protection of life and property in the U.S. are not interrupted during the move to NCWCP. This project is a key component of the NWS' effort to improve its weather and climate modeling performance, to accelerate the transfer of newly developed scientific information into operations, and to improve the use of global environmental satellite data. The NWS has demonstrated a direct linkage between establishing new facilities in the proximity of research organizations, and improved program performance. The expiration of the WWB lease dictates the timing of the NCWCP Project and affords an outstanding opportunity to enhance the NWS efforts to protect the continuity and flow of critical weather warning, forecasts and data products to the Public. The award of the lease by GSA in 2005, ensured occupancy of the new facility in October 2008.

FY 2005 funding provided project management for NOAA, and allowed NOAA to initiate the planning and engineering required to support the mission systems relocation. In FY 2007, construction of the NCWCP was completed. Simultaneously, NOAA implemented procurements to complete all tenant improvements and outfitting such as but not limited to: telecommunications cabling (systems acquisition and installation); interior design, system furniture acquisition and installation; and relocation costs. The FY 2007 effort also involved the one-time relocation of mission critical

operational systems from the WWB to the NCWCP. This critical system relocation funding will ensure that NOAA will be able to operate its "mission critical" programs by providing an overlap in system functionality during the physical relocation from the WWB to the NCWCP. Funding for project management includes a project manager, space planner, a project engineer and technical support, to provide continued coordination and oversight among all involved parties including GSA, users, contractors, and consultants.

NOAA requests an increase of \$0 and 0 FTE for a total of \$12,504,000 for Weather Forecast Office (WFO) construction funding to NOAA facilities to support NOAA facility planning requirements. As part of the National Weather Service (NWS) modernization and associated restructuring, the Weather Forecast Office (WFO) Construction program was started in the late 1980s to meet NWS WFO facility requirements supporting the provision of public weather services and the nationwide NEXRAD radar network. The original scope of the project, completed in FY 1999, included the construction or lease of 117 WFOs (13 of which were co-located with River Forecast Centers) and cost approximately \$250M. Since this time, the NWS has added five WFOs to address service coverage requirements in Guam, Northern Indiana, Caribou, ME, Huntsville, AL and Key West, FL. Other required construction elements currently ongoing include the upgrade and modernization of Alaska and Pacific Region Weather Service Offices, Tsunami Warning Centers, and associated employee housing units, upgrades of Heating, Ventilation, and Air Conditioning (HVAC) systems at approximately 60 WFOs, uninterruptible power supply (UPS) replacements, and mitigation of all building and fire code violations. This construction effort is essential to bring the NWS into full compliance with Fed-

eral law and national and local building codes.

ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICES

Proposed funding for FY 2008 includes a decrease in the Polar-Orbiting Satellite Program (POES) of \$(11.8) million, a net increase in the Geostationary Satellite Program (GOES) of \$112.4 million, and a request to fund the National Polar-orbiting Operational Environmental Satellite System (NPOESS) at the Nunn-McCurdy Certified program funding level. 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 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 for the POES program is decreasing as it approaches the end of its production cycle with one remaining satellite, NOAA N prime, to be launched. The GOES request includes a decrease of \$8.8 million for the GOES-N series of satellites, and an increase of \$113.4 million for the next generation GOES-R series. The FY 2007 GOES-R funding will begin engineering for several key instruments and continue the imager production begun in FY 2005.

The converged NOAA and Department of Defense (DOD) polar orbiting system (NPOESS) will replace the current NOAA series and the DOD Defense Meteorological Satellite Program (DMSP). A total of \$97.7 million is included in the budget request to maintain basic mission satellite services, including maintenance and operation of satellite ground facilities; provision of satellite derived products, including hazards support; and conduct

of research to improve the use of satellite data.

Included in the above request is \$3.8 million 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. Included in the budget request is \$51.9M for the NOAA Data Centers and Information Services sub-activity base operating funds.

NOAA OCEAN SERVICE (NOS).

NOS operational oceanographic observing systems are designed to measure both oceanographic and meteorological parameters in order to meet user and partner requirements. As a result, users of the data and information support a broad cross-cut of the marine transportation sector, the climate change research sector, weather and water programs, and ecosystems research community.

Funding provided through the FY 2008 budget will allow the continuation of the second generation of the NOS CO-OPS advanced data quality control program, the Continuous Operational Real-time Monitoring System (CORMS AI), as well as the continued implementation of the Ocean Systems Test and Evaluation Program (OSTEP), which is a development program for bringing new sensor technology into operations. The FY 2007 budget has allowed for sufficient support to operate the National Water Level Observation Network (NWLON) and for continued growth of the Physical Oceanographic Real-Time System (PORTS®). Both the NWLON and PORTS programs have subsets of operational water level stations with meteorological sensors installed for various partners and users,

including the NWS.

In FY 2008, NOS has requested funding to upgrade and enhance as many as 45 NWLON with new meteorological sensors. The NWLON has traditionally been an oceanographic observing system; however, NWLON technology allows multiple other sensors to be added, including meteorological sensors such as wind speed/direction/gusts, air temperature, and barometric pressure. These observations provide a significant data source for improving and verifying marine weather forecasts and warnings. Actual verification data for special marine warnings (WFO Sterling) shows a 10 percent increase in the probability of detection and a ten-minute increase in warning lead-times, due in part to an increase in marine observations. Navigation data users require a complete picture of their operating environment to make the best safety and efficiency decisions, and local meteorological data is a part of that picture. Integration of existing observing infrastructure is a cost-effective alternative to establishing new platforms. The additional meteorological data will also improve the accuracy of NWS forecasts of storm surge, marine wind speed, and marine wave heights for use by both the marine navigation and coastal communities when extreme weather events occur. The real-time information can be used by emergency responders to make sound decisions based upon which coastal areas are flooding, which evacuation routes are still viable, and other situations requiring a good understanding of the current state of the physical environment.

In FY07, Hurricane Katrina supplemental funds were used to harden existing NWLON stations to withstand storm surge. In FY08, NOS has requested funds to construct additional new NWLON stations to fill critical observation gaps identified by NWS. Initial candidate sites are likely along

the Gulf Coast. Also, NOS plans to harden additional existing Gulf Coast NWLON stations by constructing elevated strengthened platforms and relocating equipment to them.

NOS operational nowcast/forecast modeling activities are expanding and rely upon NWS Eta model data streams as hydrodynamic model drivers. NOS, in cooperation with NWS and OAR in have developed an operational nowcast/forecast capability for the Great Lakes.

OFFICE OF ATMOSPHERIC RESEARCH (OAR).

Requested funding for FY 2008 for Weather and Air Quality Research (W&AQR) is \$47.1 million--a decrease of \$11.7 million or more than 19 percent from the FY 2007 appropriation. Increases consist of upward base adjustments of \$0.9 million to partially cover inflationary cost increases. Proposed decreases include \$2.3 million from the Weather & Air Quality Research Laboratories and Cooperative Institutes line, the W&AQR share of NOAA's new Northern Gulf Institute as well as \$1.0 million from Weather & Air Quality Research Programs (Phased-Array Radar or PAR). In addition, terminations totaling \$25.3 million are proposed for: Atmospheric Investigation Regional Modeling Analysis and Prediction (AIRMAP) (\$4.9 million); New England Air Quality Study (\$3.0 million); Targeted Wind Sensing (\$2.0 million); Risk Reduction in Water Forecasts at Mississippi State University (\$2.0 million), New England Center for the Study of Atmospheric Sciences & Policy (\$1.5 million); the "STORM" Program at the University of Northern Iowa (\$0.6 million); Remote Sensing Research at the Idaho State University/Boise Center Aerospace Laboratory (\$0.5 million); East Tennessee Ozone Study (\$0.3 million); Central California Air Quality Study (\$0.4 million), Urbanet (\$5.9 million),

Great Plains Center of Atmosphere and Human Health (\$1.0 million), High-Altitude Air Study (\$0.3 million), Reducing Wind-Induced Damages from Storms (\$1.0 million), and Coordinate NASA-NOAA Severe Storm R&D (\$2.0 million).

NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM (NPOESS).

The FY 2008 DOC/DOD budget request for NPOESS is \$666.2 million. FY 2008 funds will be used for the continued development of system architecture, technology development efforts, and critical sensor and algorithm development. NPOESS is planned to be launched in FY 2013. This system will exploit advanced hardware and software technologies to produce a more reliable, longer-lived spacecraft with greater mission capability. In addition to new products, NPOESS will also provide a significant reduction (90 minutes to 30 minutes) in the time required to move from sensed to processed data.

NOAA MARINE AND AVIATION OPERATIONS (NMAO).

NMAO supports meteorological activities by collection of related data from ships and aircraft. The FY 2008 President's Budget does not include any significant increases or decreases from the FY 2007 appropriation for NMAO that are related to meteorological data collection.

DEPARTMENT OF DEFENSE (DOD)

The DOD total budget request for FY 2008, including NPOESS funding, is \$1.07 billion which represents a funding increase of 10.1 percent from FY 2007. Specific highlights for each of the military departments are described below:

UNITED STATES AIR FORCE (USAF)

USAF resources for meteorological

support fall into several categories: general operations, investment and research, Defense Meteorological Satellite Program (DMSP), and National Polar-orbiting Operational Environmental Satellite System (NPOESS) supporting research. The total Air Force operations and investment funding for fiscal year 2008, including DMSP and NPOESS, is \$846 million.

General Operations

The operations portion of Air Force Weather's fiscal year 2008 budget is \$326.8 million and funds day-to-day environmental support to the Department of Defense, including the Active and Reserve components of the Air Force and Army, nine unified commands, and other agencies as directed by the Chief of Staff of the Air Force. Just over 4,400 Active and Reserve Component military and civilian personnel conduct these activities at more than 275 locations worldwide. Approximately 85 percent of personnel specialize in weather; the remainder includes communications, computer, administrative, and logistics specialists.

General Supporting Research

Air Force Weather's fiscal year 2008 budget request for supporting research is \$37.5 million. As part of AF Smart Operations 21st Century (AFSO 21), Air Force Weather is investing in modernized environmental prediction technologies and global information grid technologies that enhance automation and save manpower. Air Force Weather continues their extensive initiative to build-up the strategic center's information technology infrastructure for the expected 10-fold increase in satellite data. Also, Air Force Weather is investing in the following innovative software and/or systems development efforts in fiscal year 2008 and beyond: the Joint Environmental Toolkit (JET), Weather Data Analysis (WDA), and

the Ensemble Prediction System (EPS). The goals of JET, WDA, and EPA are to simplify, standardize, minimize, and automate weather operations at the operational and tactical levels.

Specifically, JET will eliminate redundancies and/or inefficiencies and ultimately extend, consolidate and/or replace the Operational Weather Squadron (OWS) Production System-Phase II (OPS II), the Joint Weather Impacts System (JWIS), the New-Tactical Forecast System (N-TFS), and the weather effects decision aids portion of the Integrated Meteorological System (IMETS). WDA will provide many of the behind the scene tools at the weather production centers necessary for enabling JET to provide decision-quality products and information to warfighters. EPS will provide the foundation to fundamentally change legacy forecast processes to an AFSO 21 compatible process necessary for the rapidly changing, net-centric, machine-to-machine future environment.

While JET, WDA and EPS work synergistically to provide warfighters a quantum leap in capability, JET is the most visible piece to decision-makers. JET will exploit data contained in the Virtual Joint Meteorological Oceanographic (METOC) Database via common-user-communications, integrate with joint and coalition command and control and mission planning systems, and provide the machine-to-machine data exchange for assimilating METOC and C4ISR data to meet operational and tactical mission planning and execution requirements.

DMSP

DMSP operations are a critical source of space-borne meteorological data for the Military Services and other high-priority DOD programs. DMSP environmental data is also distributed to the National Weather Service, National Environmental Satellite, Data, and Information Service, the

Navy's Fleet Numerical Meteorology and Oceanography Center, the Naval Oceanographic Office, and Air Force Weather Agency according to interagency agreements.

The Air Force's total projected FY08 outlays for DMSP are \$145.1 million. This funding provides for the operations and sustainment of the on-orbit constellation, as well as integration, test, and flight hardware modifications and replacement to maximize performance and longevity of the satellites that remain to be launched. DMSP satellites are acquired and launched by the Air Force and funding to operate the satellites on-orbit is transferred by the Air Force to National Oceanic and Atmospheric Administration each year.

NPOESS Supporting Research

The fiscal year 2008 DOD R&D budget for NPOESS is \$334.9 million for the continued development of system architecture, technology, critical sensors, and algorithms. These dollars are applied to both the NPOESS Preparatory Project run by NASA and the NPOESS program being which is being acquired by a tri-agency Integrated Program Office.

US NAVY

The Department of the Navy's (DON) proposed \$139.8 billion budget request for fiscal year 2008 (FY08) fully supports near and long-term warfighting requirements and will help win the Global War on Terrorism. The US Navy FY08 budget request for meteorological programs is \$106.3 million. The request includes \$87.4 million for operational programs and \$18.9 million for supporting research.

Naval Oceanography Program (NOP)

NOP remains a unique, world-class program. Focusing support in the environmentally complex coastal/littoral regions around the globe, Naval METOC personnel (Navy and Marine

Corps) are required to provide intelligence preparation of the environment (IPE) for operational decision makers by assessing the impact of atmospheric and ocean phenomena on platforms, sensors and weapon systems. Additionally, Navy and Marine Corp METOC personnel provide 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, educated in both sciences and warfighting applications. By teaming with, and leveraging the efforts of other agencies and activities, the NOP meets these challenges in a most cost effective manner, providing a full spectrum of products and services with only a small percentage of the Federal weather budget.

The NOP is required to provide comprehensive and integrated weather and ocean support worldwide. The Oceanographer/Navigator of the Navy sponsors programs in four closely related disciplines - meteorology, oceanography, geospatial information services, and precise time and astrometry. All are used to protect ships, aircraft, fighting personnel, 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.

Littoral Battlespace Sensing, Fusion, and Integration (LBSF&I)

LBSF&I is the Department of the Navy's principal Intelligence Preparation of the Environment approach for atmospheric and oceanographic data collection, processing, and data/product dissemination to users. LBSF&I will facilitate better tactical decision making by enabling a system of networked sensors to allow information

sharing through interoperability with naval and joint networks and information systems. It addresses critical gaps with respect to environmental data fidelity (in time and space) shown to play a critical role in force disposition and force posture in current and future naval missions. LBSF&I is a critical persistent IPE technology, is considered a key component of the Naval Oceanography Battlespace on Demand framework, and supports the Battlespace Awareness Joint Capability Area through 2020 and beyond.

Operational Support

Naval METOC support starts with sensing the battlespace without being adversely affected by physical environmental and culminates with weapons arriving on target and enabling personnel to operate 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 METOC products and services. As naval operations in the littoral increase, Naval METOC support is directed towards providing on-scene capabilities to personnel that directly furnish environmental data for sensor, weapon system, and personnel 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.

Owing to the crucial interrelationship of the ocean and the atmosphere, Naval METOC requires various oceanographic products to provide the requisite meteorological services. In addition to aviation and maritime METOC support, Navy and Marine Corps METOC teams provide a variety of unique services on demand, such as electro-optical, electro-magnetic, and acoustic propagation models and products, METOC-sensitive tactical deci-

sion aids, and global sea ice analyses and forecasts.

Systems Acquisition

Naval METOC systems acquisition is accomplished through the Program Executive Office for Command, Control, Communication, Computes and Intelligence and Space (C4I and Space) in San Diego, California.

Research and Development (R&D)

Naval METOC R&D are cooperatively sponsored by the Oceanographer/Navigator of the Navy and the Chief of Naval Research. Naval 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.

Projects initiated by the Navy and Marine Corps, under sponsorship of the Oceanographer/Navigator of the Navy, transition from engineering development to operational naval systems. Such efforts include advances in Naval METOC forecasting capabilities, 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, weapons systems, and platform performance.

To realize the opportunities and navigate the challenges ahead, the Department of Navy must have a clear vision of how they will organize, integrate, and transform. "*Sea Power 21*" is that vision. It will align our efforts, accelerate our progress, and realize the potential of our people. Support to naval operations is provided under the direction of the Commander, Naval Meteorology and Oceanography Command (CNMOC) located at the Stennis

Space Center, Mississippi and the Marine Corps advocate for METOC, the Deputy Commandant for Aviation, at Headquarters Marine Corps, Washington, D.C.

The CNMOC organization has recently transformed for efficiency and effectiveness to meet these future requirements. With the addition of the Naval Oceanography Operations Command the NOP optimizes warfighting recourses, supports safe operations and enhances dominance of the battlespace through superior understanding and exploitation of the environment. The Naval METOC community continues to work closely with research developers and operational forces to ensure that naval and joint force commanders will always have the most accurate, timely, and geo-referenced METOC information available for successful operations.

US ARMY

The US Army estimates a requirement for \$106.3 million for operational support and \$10.7 million in R&D in fiscal year 2008. The total amount of money budgeted for weather support is estimated because the costs to support USAF Battlefield Weather forces are normally part of the overall G-3 or G-2 operating budget at the Army Commands (ACOMs), Army Service Component Commands (ASCCs), corps, division, or brigade level and are not assigned their own program element or budget line. Additionally, programs or projects that are assigned a budget line are often part of a larger project's budget and the exact amount of monies spent on meteorological related activities cannot be verified. The budget numbers presented in this report represent the best estimate of the Army regarding meteorological related spending over the period of the report. Operational support is projected to increase approximately \$40 million over the fiscal year 2007 expenditures and research is estimated to decrease

about \$0.7 million from the previous year. Staffing levels remain stable for fiscal year 2008. The large increase in operational funding is attributed to increases in the AN/TMQ-52 Meteorological Measuring Set - Profiler (MMS-P) program. The MMS-P received an increase of \$16.2 million in fiscal year 2007 and is programmed to receive an increase of \$64.8 million in fiscal year 2008 to procure additional AN/TMQ-52 MMS-P systems in support of Army combat operations.

Army monies for meteorology are spent in four main areas: support to US Army Artillery Met Sections (ARTYMET), support to USAF Battlefield Weather forces at Army locations, research and development related to the Army mission, and the development, production, and maintenance of Army meteorological systems.

ASCCs with staff weather officers and their associated battlefield weather forces provide the same support and services to Air Force Weather (AFW) personnel that they normally provide to Army personnel. This support includes the use of facilities to house weather operations, medical support, access to training facilities, office supplies, utilities and maintenance for weather facilities, vehicles and tactical equipment, and funding for official travel. Eighth US Army, US Army Europe, US Army Pacific, Forces Command, and Training and Doctrine Command (TRADOC) all provide this support to AFW personnel assigned at the ACOM level and below.

Major portions of ACOMs and ASCCs meteorological budgets go to support Artillery Meteorology Sections, also known as ARTYMET Teams, or Met Sections. Wind data are then passed to the US Army Artillery units for firing computations. Artillery Met Sections range in size from 6 personnel at a light division to 12 personnel at a heavy division. Eighth U. S. Army, US Army Europe, US Army

Pacific, Forces Command, and the Army National Guard all support Met Sections. Training and Doctrine Command supports 24 military and civilian personnel at the US Army Artillery School at Fort Sill, Oklahoma. These personnel train ARTYMET Teams on the use of the AN/TMQ-41 Meteorological Measuring Set. ARTYMET team structures will be changing over the next few years to support the Army's new modularity concept. No attempt has been made to convert the part-time Army National Guard ARTYMET Teams into full time equivalents.

Headquarters, Department of the Army, Deputy Chief of Staff, G-2 employs two full-time meteorologists for development of meteorological policy; coordination of meteorological support within the Department of the Army and with other Department of Defense and Federal agencies and organizations; Department of the Army Policy concerning weather; environmental services, and oceanographic support to the Army (less those environmental services functions assigned to the Corps of Engineers); and Department of the Army policy concerning peacetime weather support.

The Air Force provides one full time staff weather officer to serve as a liaison between AFW and the Army Staff. Forces Command (FORSCOM) will program approximately \$13.2 million in fiscal year 2008 for meteorological operations support. This is a decrease of \$0.9 million from the previous year.

The budgeted amount will be used in support of FORSCOM ARTYMET operations. An additional, undetermined amount of less than \$1 million will be spent for supplies, travel, and other contracts for Air Force weather teams supporting FORSCOM units. FORSCOM and subordinate units do not budget directly for Air Force Weather teams, but provide some support for them on an as-needed basis from general operations and mainte-

nance budgets.

TRADOC has programmed approximately \$3.37M for FY07 for meteorological services. The majority of these TRADOC funds, a total of \$3.15M, were programmed for operations support related to training development, instructor/support personnel, logistics (expendable supplies), and repair costs on artillery meteorological systems at the US Army Field Artillery School (USAFAS). Training development costs (~\$1.06M) in FY07 are a result of initiatives to develop interactive multi-media instructional products and cost associated with rewrite of the artillery meteorology field manual. Because of the previous 2 years (FY06-07) of investment in creating training development products, training products will remain available without development costs in FY08. Instructor/support personnel costs (~\$1.71M) in FY07 are the result of USAFAS at Fort Sill, OK employing 26 personnel to conduct training using the AN/TMQ-41 Meteorological Measuring Set (MMS) and the AN/TMQ-52 Meteorological Measuring Set-Profiler (MMS-P). Personnel funding is expected to increase by ~\$283K in FY08 due to the addition of three instructors (two contractors and one enlisted soldier) to support the increased number of soldiers dictated by the Army's modular design. Logistics/supply costs (~\$151K) in FY07 funds supplies for meteorological sounding equipment to support live fire and training at Fort Sill. In FY08 supply costs are expected to be ~\$160K. Repair costs (~\$230K) in FY07 on artillery meteorological systems is expected to increase by ~\$30K in FY08 due to the costs associated with maintaining and operating a second MMS-Profiler system. TRADOC also programmed \$69K in FY07 to fund a TRADOC Capabilities Manager (TCM) position for the Army's Integrated Meteorological System (IMETS). This position falls under the

TRADOC Program Integration Office - All Source Analysis System (TPIO-ASAS) at the US Army Intelligence Center and School (USAICS) at Ft Huachuca, AZ. TPIO-ASAS has programmed \$70K for this same position in FY08. TRADOC transferred \$154K in FY07 to Air Combat Command for the maintenance and service of five Army Automated Surface Observing Sensor systems and two Army pole-mounted Tactical Meteorological Observing Systems at Fort Rucker, AL. Contract maintenance and service costs have been programmed to increase to ~\$160K in FY08.

Army Materiel Command (AMC) will fund a variety of activities for FY 2008, most of which fall into research and development and systems acquisition. There has been no IMETS funding line for the last two fiscal years (FY06 and FY07). There have been 3 sources of funding available to the IMETS Project Office during this period - DA restored OPA funding via Program Manager Intelligence Fusion, Distributed Common Ground System - Army (DCGS-A) OPA, and DCGS-A R&D. Fiscal year 2007 OPA funds are being used for the continued production, fielding, and support of IMETS. Northrop Grumman Corporation (Tacoma/Lakewood, WA) is the primary contractor supporting the OPA effort. R&D funding supports the development of new capabilities, the testing and integration of IMETS capabilities into the DCGS-A, and to integrate the Air Force JET software into the IMETS/DCGS-A. The Army Research Laboratory and the New Mexico State University Physical Sciences Laboratory partner on IMETS development and technology insertion efforts. IMETS Project Office closes on 30 September 2007, to become DCGS-A Weather Services. Future funding for DCGS-A Weather Services (IMETS) will come from DCGS-A Program funding. To date, DCGS-A has not programmed fiscal year 2008

OPA funds to sustain and support the fielded IMETS. IMETS Project Office fiscal year 2008 R&D funding requirements are going through the DCGS-A process for approval and funding. IMETS fielded software support has transitioned to the CECOM Software Engineering Center, but it is unclear whether or not they will receive OMA funding for IMETS fielded software support in fiscal year 2008. Maintenance and support for the fielded IMETS, until the systems are replaced by DCGS-A, remains an issue to be resolved.

CECOM also oversees management of the AN/TMQ-52 Meteorological Measuring Set-Profiler program. This program received a supplemental increase in FY07 and has requested additional funds for FY08 to purchase additional systems in support of Army combat operations. Other activities within AMC include Army Research Laboratory, Battlefield Environment Division, which will continue to operate an integrated program of both basic and applied research.

The FY07 budget for weather support within Eighth US Army increased \$1,350,000 (HQDA funded) for the acquisition and fielding of 15 additional automated weather sensor systems and upgrade to the 5 systems fielded in FY05. Budget activity of \$762,000 was slightly lower and provided steady state operational support for meteorological services by Army ARTYMET (\$730,000) and Air Force (\$32,000) units. FY08 will see an increase of \$183,000 to renew the warranty and maintenance contract supporting the 20 automated weather sensor system network. Budget activity will increase to \$866,000 to support requirements from the fielding of the Army ARTYMET AN/TMQ-52 Profiler System (\$825,000) and to restore Air Force funding (\$41,000) from FY07 budget cuts.

The US Army Pacific (USARPAC) budget for Army Meteorological sup-

port will slightly increase for FY07/08. The 25ID(L), supported by the 25th Air Support Operations Squadron, received an increased estimate for FY07 IMETS-V and IMETS-L sustainment funds. In addition, a new Modified Table of Organization and Equipment for USARPAC's Operational Command Post authorizes an IMETS-L system for USARPAC, which will require sustainment funding in late FY07 and into FY08. ARTYMET personnel levels remain the same, but costs increased due to the annual cost of living increase for military personnel.

Because of changes in the US Army Research Institute of Environmental Medicine (USARIEM) research program for FY07, there was an increase in expenditures on weather-related research. It is anticipated that FY08 funding for weather-related research efforts at the USARIEM will be level relative to the FY07 level.

Space and Missile Defense Command (SMDC) supports several meteorological missions. SMDC has funding designated for the operational support at the High Energy Laser Systems Test Facility for contract services to operate and maintain the instrumentation, equipment, and facilities to support the atmospheric sciences/meteorological mission. SMDC also operates contract support services to operate the Ronald Reagan Missile Defense Test Site for operations support and special weather programs.

DEPARTMENT OF HOMELAND SECURITY (DHS)

U.S. COAST GUARD (USCG)

All of USCG's funding for meteorological programs is for operations support. For FY 2008, the requested funding level is \$21.5 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. Coast Guard efforts in meteorological operations and services have not changed significantly during recent years.

DEPARTMENT OF THE INTERIOR (DOI)

The total DOI/BLM weather funding request for FY 2008 is \$2.4 million. This amount is for meteorological operations and the support of the Bureau of Land Management (BLM) Remote Automatic Weather Station (RAWS) program. An additional \$1.1 million is recovered each year through reimbursable accounts with participating agencies. Normal operations and maintenance of the RAWS program is approximately \$900,000 yearly. (This includes travel, transportation, utilities, services, supplies, equipment and other non-labor costs.)

Support of the RAWS program by the BLM will continue in FY 2008, as part of the Wildland Fire Agencies'

participation in Fire Weather activities and the National Fire Danger Rating System (NFDRS). In addition to upgrading and maintaining fixed-site RAWS, the BLM will address increasing demand for the use of mobile units for both fire and non-fire applications. Continued efforts will be made to achieve an optimum balance of fixed and mobile RAWS resources and support. Cooperation between DOI agencies and the USDA Forest Service regarding combined meteorological requirements for the National Wildland Fire support functions is ongoing. Interagency RAWS activity is coordinated at a working group level with representation by all participants, and will continue to implement NFDRS standards to ensure the protection of both life and property from wildland fires.

DEPARTMENT OF TRANSPORTATION (DOT)

The DOT total budget request for FY 2008 is \$494.6 million which represents a funding decrease of 9.4 percent from FY 2007. The meteorological programs for the Federal Aviation Administration and the Federal Highway Administration, for FY 2008, are described below.

FEDERAL AVIATION ADMINISTRATION (FAA)

For 2008, FAA has requested a total \$490.4 million for the Aviation Weather Programs including acquisition of new systems, operations and support, and supporting research. The actual funding for aviation weather in FY 2007 was \$541.9 million. The \$51.5 million decrease in FY 2008 constitutes a 9.5 percent decrease in total funding. The changes are comprised of:

- a decrease in acquisitions of \$1.4 million (1.4 percent) to \$92 million;
- a decrease in operations and support of \$47 million (11 percent) to \$362 million, reflecting salary increases throughout the agency, in associated logistics, and a decrease in

Federal personnel in the automated flight service station operations as a result of the A-76 contract award; and

- an increase for aviation weather research of \$4.7 million to a total of \$28.3 million.

The funding changes reflect major initiatives in the aviation weather programs to bring much automation to the collection of weather observations from remote sensors, to the dissemination of weather products, graphics and decision making information available for use by the air traffic facilities, pilots, the aviation industry and general aviation users.

The AWRP will continue research into understanding the geophysical phenomena in the atmosphere and around airports that present hazardous conditions for aircraft operations. Among these are in-flight icing, turbulence, visibility, ceiling, convective activity, tornadoes, etc. Additional work will be done to improve models, develop better graphics for decision making information, and the impacts of space weather.

FEDERAL HIGHWAY ADMINISTRATION (FHWA)

The total FHWA request for surface transportation weather programs in FY 2008 is \$4.2 million, all of which will be used for supporting research and special programs.

In 1999, the FHWA began documenting road weather data requirements, and this has served as the basis for the majority of work and research in this area. This work, some of which is described below, includes addressing the technical aspects of the road transportation system (including environmental data collection, processing and dissemination) as well as the institutional challenges associated with system implementation.

Addressing these institutional challenges has helped foster coordination within state and local Departments of Transportation (DOTs) as well as

across the transportation and meteorological communities. With regard to technical areas of interest, data collection efforts have included increased coverage of atmospheric and road condition observations, as well as incorporation of 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 road weather information. This road weather information will enable more effective decision making, leading to a safer and more efficient surface transportation system.

A USDOT initiative entitled Clarus will develop, demonstrate and support deployment of a nationwide surface transportation weather observing and forecasting system, and ultimately foster nationwide data sharing capabilities. Clarus will allow agencies to share quality-checked environmental data, ultimately improving forecasts and value-added weather information products, as well as supporting anytime, anywhere road weather information for all road and transit users and operators.

A multi-year effort has been undertaken by the FHWA in cooperation with six national laboratories to prototype and field test advanced decision support tools for winter maintenance managers. The Maintenance Decision Support System (MDSS) prototype is a decision support tool that integrates relevant road weather forecasts, coded rules of practice for winter maintenance operations, and maintenance resource data to provide managers with customized road treatment recommendations. The first functional MDSS prototype was demonstrated in Iowa in early 2003 and during the winter season of 2003-2004. During the winter season of 2004-2005, the MDSS proto-

type was successfully deployed in a third demonstration in Colorado and in early 2006; this product was declared a "market ready technology." The current focus of the MDSS project is to continue to build on current outreach program activities such as sponsoring annual stakeholder meetings, conducting product "RoadShows," facilitating technology transfers to the private sector, providing assistance to public agencies in writing request for proposals, and participating in informational conferences. The project team also plans to conduct a series of cost/benefit analyses to produce "hard" financial data that can be used to support investing in such a system and exploring the potential of expanding the functionality of MDSS beyond winter maintenance to include such activities as non-winter road maintenance and traffic management.

The FHWA recently completed a study on how Traffic Management Centers (TMCs) around the country integrate road weather information into their operations. The FHWA documented the types of road weather information received by TMCs, the means of information delivery, how information needs change as the severity of a weather event increases, and how that information impacts traffic management decisions. The FHWA is also conducting analyses and developing models to quantify the impacts of various weather events on highway traffic, as well as investigating a variety of weather-responsive traffic management strategies such as changing traffic signal timing in response to weather and posting weather-related messages on variable message signs. These efforts will help FHWA advance the state-of-the-practice in weather-responsive traffic management.

The efforts described above, as well as future activities captured in the Road Weather Management program plan will be examined within the context of two key reports published in

early 2004 and described below.

In 2002, the FHWA asked the National Research Council (NRC) Board of Atmospheric Sciences & Climate to examine what needs to be done from the research, development, and technology transfer perspectives to improve the production and delivery of weather-related information for the nation's roadways. In March 2004, the NRC released a report, *Where the Weather Meets the Road: A Research Agenda for Improving Road Weather Services*, which recommended the creation of a focused, national road weather research program led by FHWA that brings together the transportation and meteorological communities, identifies research priorities, and implements new scientific and technological advances. The NRC recommendations included making better use of existing road weather information and technologies to increase capabilities for transportation research, establishing a nationwide real-time road weather observing system, developing observing capabilities to assess the accuracy of road weather forecasts, improving environmental sensor technologies, and developing new means to effectively communicate road weather information to a wide range of users. Most, if not all of these recommendations, have been incorporated into the roadmap that is being used to guide the activities of the Road Weather Management Program.

To strengthen relationships between the meteorological and surface transportation communities, the FHWA Road Weather Management Program and the American Meteorological Society (AMS) co-sponsored a Policy Forum on Weather and Highways in November 2003. The objective was to discuss the provision of weather information to improve highway operations, the development of strategies to effectively respond to weather information, and the policy issues related to effective application of weather serv-

ices to the management of the nation's highway system. The forum brought together nearly 100 representatives from public, private, and academic sectors at Federal, state, and local levels. The report resulting from the forum, *Weather and Highways: Report of a Policy Forum*, contained several recommendations including long-term congressional funding to develop a national road weather research, development, and applications program; close coordination of Federal and state DOTs to improve the safety and efficiency of highways during adverse weather; and establishing a national road weather data collection, processing, and dissemination system.

Based upon the recommendations that were made in the AMS and NRC reports, the FHWA and the National Oceanic and Atmospheric Administration (NOAA) signed a memorandum of understanding (MOU) in July of 2005, to enable the two agencies to work together to achieve shared goals for a safer and more efficient surface transportation system. By working together, these two agencies will be able to take advantage of each other's investments and expertise, as well as promote improved surface transportation weather training, products, and services. A near-term goal of this partnership will be the introduction of new products, services and training to improve the application of weather information to surface transportation operations.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

All of the EPA's funding of meteorological and air quality programs is for supporting research. The anticipated funding level in FY 2008 for directed meteorological research is \$9.0 million which is the same funding level as in FY 2007.

Currently, increased attention is being paid to the effects of airborne toxins and fine particulate matter on

human health, on the effect of climate change on air quality, and the impact on ecosystems. In addition, to promote excellence in environmental science and engineering, EPA established a national fellowship program and substantially increased its support for investigator-initiated research grants. The 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 about the same in FY 2008 as in FY 2007.

This program will fund research in areas including ecological assessment, air quality, environmental fate and treatment of toxins and hazardous wastes, effects of global climate change on air quality, and exploratory research. The portion of these grants that will be awarded for meteorological research during FY 2008 cannot be foreseen, but it is probable that the grant awards will increase the base amount of \$9.0 million listed above for directed meteorological research.

In collaboration with NOAA, EPA is continuing its development and evaluation of air quality models for air pollutants on all temporal and spatial scales as mandated by the Clean Air Act as amended in 1990. Research will focus on urban, mesoscale, regional, and multimedia models, which will be used to develop air pollution control strategies, human and ecosystem exposure assessments, and air quality forecasting. There will be increased emphasis placed on meteorological research into regional and urban formation and transport of air contaminants in support of the revisions to the National Ambient Air Quality Standards and homeland security. Increased efficiency of computation and interpretation of results are being made possible by means of

supercomputing and scientific visualization techniques.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

For FY 2008, NASA requests a total of \$168.7 million. The majority of this funding (\$166.4 million) is for supporting research.

Nearly all of NASA funding in meteorology is for supporting research. The NASA Earth Science Division (ESD) budget consists of seven programs: Earth Systematic Missions, Earth Science Pathfinder, Research, Applied Sciences, Multi-Mission Operations, Technology and Education and Outreach. It is very difficult to extract the funding levels attributable to meteorology from the way the ESD budget is structured. The budget numbers presented here are obtained from the ESD budget by arbitrarily assigning approximately one ninth of the ESD budget to meteorology with the Earth Systematic Missions program contributing to the Systems Development line and the other six programs to the Research and Development line.

NUCLEAR REGULATORY COMMISSION (NRC)

The NRC planned expenditure of \$120,000 in FY 2008, is for meteorological operations to continue technical assistance for the analysis of atmospheric dispersion for routine and postulated accidental releases from nuclear facilities, and the review of proposed sites for possible construction of new nuclear power plants.

The meteorological support program in the NRC is focused primarily on analyzing and utilizing meteorological data in atmospheric transport and dispersion models. These models provide insight on plume pathways in the near- and far-fields for building wake and dispersion characteristics to perform dose calculations on postulated releases to the environment. Meteorological

information is used as input to the probabilistic safety assessment, the assessment of the radiological impacts of routine releases from normal operations, the assessment of other (non-radiological) hazards that may impact safe operation of the facility, and the assessment of design or operational changes proposed for the facility.

Additionally, after a hiatus of some 25 years, the nuclear power industry has expressed an interest in seeking site approvals for new nuclear power plants. Three early site permit applications have been received and are currently under review. These reviews will also consider regional climatology and local meteorology. In addition to its internal review activities, the NRC may seek assistance from other Federal agencies to support its safety reviews.

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.

In FY 2008, Operational Costs requested are \$3.05 billion with a total of \$1.78 billion (58.4 percent) for Operations Support, \$1.23 billion (40.4 percent) for Systems Acquisition, and \$36.5 million (1.2 percent) for Special Programs.

Table 2.3 describes how the agencies plan to obligate their funds for meteorological supporting research according to budget categories. The agencies' support-

ing 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).

For FY 2008, agencies will obligate a total of \$740.6 million in Supporting Research funds in the following manner: \$307.3 million (41.5 percent) to research and development and \$433.3 million (58.5 percent) to Systems Development.

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 FY 2008 operational funds: basic meteorology services receiving 59.4 percent; aviation 16.3 percent; marine 4.1 percent; agriculture/forestry 0.7 percent; general military services 19.2 percent; and other specialized services accounting for 0.2 percent. Table 2.5 shows the distribution of supporting research funds among the services with basic meteorology receiving 14.9 percent, aviation 4.1 percent, marine 0.1 percent, agriculture and forestry 4.0 percent, general military 52.0 percent, and the remaining 24.9 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.

PERSONNEL ENGAGED IN METEOROLOGICAL OPERATIONS

Table 2.6 depicts agency staff resources in meteorological operations. The total agency staff resources

requested for FY 2008 is 12,260. This total represents a decrease of 2.7 percent from FY 2007, with the largest

decreases occurring in the DOD/Navy and DOT/FAA personnel.

TABLE 2.2 AGENCY OPERATIONAL COSTS, BY BUDGET CATEGORY
(Thousands of Dollars)

AGENCY	Operations Support		Systems Acquisition		Special Programs		Total		% of FY2008 TOTAL
	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	
Agriculture	19107	19563	0	0	0	0	19107	19563	2.4
Commerce/NOAA(Subtot)	942416	955784	880738	887637	33971	27760	1857125	1871181	0.8
NWS	754408	787156	74664	67131	32815	26604	861887	880891	2.2
NESDIS***	147337	129931	806074	820506	0	0	953411	950437	-0.3
OAR	0	0	0	0	0	0	0	0	0.0
NOS	28337	26363	0	0	0	0	28337	26363	-7.0
NMAO	12334	12334	0	0	1156	1156	13490	13490	0.0
Defense(Subtot)	379855	413076	171702	251991	661	661	552218	665728	20.6
Air Force***	258172	276460	54754	50408	0	0	312926	326868	4.5
DMSP*	14913	17796	86376	127350	0	0	101289	145146	43.3
Navy	71441	86122	1212	1248	0	0	72653	87370	20.3
Army	35329	32698	29360	72985	661	661	65350	106344	62.7
Homeland Security (Subtot)	20110	21540	0	0	0	0	20110	21540	7.1
USCG	20110	21540	0	0	0	0	20110	21540	7.1
Interior/BLM	2400	2400	0	0	0	0	2400	2400	0.0
Transportation(Subtot)	419090	362340	93110	91738	6135	8039	518335	462117	-10.8
FAA	419090	362340	93110	91738	6135	8039	518335	462117	-10.8
FRA	0	0	0	0	0	0	0	0	0.0
FHWA	0	0	0	0	0	0	0	0	0.0
EPA	0	0	0	0	0	0	0	0	0.0
NASA	2269	2220	154	169	0	0	2423	2389	-1.4
NRC	120	120	0	0	0	0	120	120	0.0
TOTAL	1785367	1777043	1145704	1231535	40767	36460	2971838	3045038	2.5
% of FY TOTAL	60.1%	58.4%	38.6%	40.4%	1.4%	1.2%	100.0%	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.

***NESDIS and Air Force budget numbers also include the DOC and DOD shares of the NPOESS budget, respectively.

TABLE 2.3 AGENCY SUPPORTING RESEARCH COSTS, BY BUDGET CATEGORY
(Thousands of Dollars)

AGENCY	Research & Development		Systems Development		Special Programs		Total		% of FY2008 TOTAL
	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	
Agriculture	35982	29216	0	0	0	0	35982	29216	-18.8
Commerce/NOAA(Subtot)	107933	94978	4320	4320	0	0	112253	99298	-11.5
NWS	20555	20651	1950	1950	0	0	22505	22601	0.4
NESDIS	29854	27871	0	0	0	0	29854	27871	-6.6
OAR	56368	45300	1870	1870	0	0	58238	47170	-19.0
NOS	0	0	500	500	0	0	500	500	0.0
NMAO	1156	1156	0	0	0	0	1156	1156	0.0
Defense(Subtot)	51195	42782	368659	361405	0	0	419854	404187	-3.7
Air Force***	15439	13213	367696	361405	0	0	383135	374618	-2.2
DMSP*	0	0	963	0	0	0	963	0	-100.0
Navy	24335	18910	0	0	0	0	24335	18910	-22.3
Army	11421	10659	0	0	0	0	11421	10659	-6.7
Homeland Security (Subtot)	0	0	0	0	0	0	0	0	0.0
USCG	0	0	0	0	0	0	0	0	0.0
Interior/BLM	0	0	0	0	0	0	0	0	0.0
Transportation(Subtot)	27800	32514	0	0	0	0	27800	32514	17.0
FAA	23600	28314	0	0	0	0	23600	28314	20.0
FRA	0	0	0	0	0	0	0	0	0.0
FHWA	4200	4200	0	0	0	0	4200	4200	0.0
EPA	9000	9000	0	0	0	0	9000	9000	0.0
NASA	104500	98800	58200	67600	0	0	162700	166400	2.3
NRC	0	0	0	0	0	0	0	0	0.0
TOTAL	336410	307290	431179	433325	0	0	767589	740615	-3.5
% of FY TOTAL	43.8%	41.5%	56.2%	58.5%	0.0%	0.0%	100.0%	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.

***Air Force budget numbers also include the DOD share of the NPOESS budget

TABLE 2.4 AGENCY OPERATIONAL COSTS, BY SERVICE
(Thousands of Dollars)

AGENCY	Basic Meteorology		Aviation		Marine		Agriculture & Forestry		General Military		Other		Total	
	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008
Agriculture	0	0	0	0	0	0	19107	19563	0	0	0	0	19107	19563
Commerce/NOAA(Subtot)	1756255	1773089	15328	16528	85542	81564	0	0	0	0	0	0	1857125	1871181
NWS	789354	809162	15328	16528	57205	55201	0	0	0	0	0	0	861887	880891
NESDIS***	953411	950437	0	0	0	0	0	0	0	0	0	0	953411	950437
OAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NOS	0	0	0	0	28337	26363	0	0	0	0	0	0	28337	26363
NIMAO	13490	13490	0	0	0	0	0	0	0	0	0	0	13490	13490
Defense(Subtot)	12351	14853	22936	26396	21069	25337	0	0	492229	594773	3633	4369	552218	665728
Air Force***	0	0	0	0	0	0	0	0	312926	326868	0	0	312926	326868
DMSP*	0	0	0	0	0	0	0	0	101289	145146	0	0	101289	145146
Navy	12351	14853	21796	26211	21069	25337	0	0	13804	16600	3633	4369	72653	87370
Army	0	0	1140	185	0	0	0	0	64210	106159	0	0	65350	106344
Homeland Security (Subtot)	0	0	0	0	20110	21540	0	0	0	0	0	0	20110	21540
USCG	0	0	0	0	20110	21540	0	0	0	0	0	0	20110	21540
Interior/BLM	0	0	0	0	0	0	2400	2400	0	0	0	0	2400	2400
Transportation(Subtot)	0	0	518335	462117	0	0	0	0	0	0	0	0	518335	462117
FAA	0	0	518335	462117	0	0	0	0	0	0	0	0	518335	462117
FRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FHWA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EPA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NASA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRC	120	120	0	0	0	0	0	0	0	0	0	0	120	120
TOTAL	1768726	1788062	556599	505041	126721	128441	21507	21963	492229	594773	6056	6758	2971838	3045038
% of FY TOTAL	59.5%	58.7%	18.7%	16.6%	4.3%	4.2%	0.7%	0.7%	16.6%	19.5%	0.2%	0.2%	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.
***NESDIS and Air Force budget numbers also include the DOC and DOD share of the NPOESS budget, respectively.

TABLE 2.5 AGENCY SUPPORTING RESEARCH COSTS, BY SERVICE
(Thousands of Dollars)

AGENCY	Basic		Aviation		Marine		Agriculture & Forestry		General Military		Other		Total	
	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008	FY2007	FY2008
Agriculture	0	0	0	0	0	0	35982	29216	0	0	0	0	35982	29216
Commerce/NOAA(Subtot)	110128	97173	1625	1625	500	500	0	0	0	0	0	0	112253	99298
NWS	22505	22601	0	0	0	0	0	0	0	0	0	0	22505	22601
NESDIS	29854	27871	0	0	0	0	0	0	0	0	0	0	29854	27871
OAR	56613	45545	1625	1625	0	0	0	0	0	0	0	0	58238	47170
NOS	0	0	0	0	500	500	0	0	0	0	0	0	500	500
NMAO	1156	1156	0	0	0	0	0	0	0	0	0	0	1156	1156
Defense(Subtot)	11032	10259	0	0	24335	18910	0	0	384487	375018	0	0	419854	404187
Air Force***	0	0	0	0	0	0	0	0	383135	374618	0	0	383135	374618
DMSP*	0	0	0	0	0	0	0	0	963	0	0	0	963	0
Navy	0	0	0	0	24335	18910	0	0	0	0	0	0	24335	18910
Army	11032	10259	0	0	0	0	0	0	389	400	0	0	11421	10659
Homeland Security (Subtot)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USCG	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interior/BLM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation(Subtot)	0	0	23600	28314	0	0	0	0	0	0	4200	4200	27800	32514
FAA	0	0	23600	28314	0	0	0	0	0	0	0	0	23600	28314
FRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FHWA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EPA	0	0	0	0	0	0	0	0	0	0	4200	4200	4200	4200
NASA	0	0	0	0	0	0	0	0	0	0	9000	9000	9000	9000
NRC	0	0	0	0	0	0	0	0	0	0	162700	166400	162700	166400
TOTAL	121160	107432	25225	29939	24835	19410	35982	29216	384487	375018	175900	179600	767589	740615
% of FY TOTAL	15.8%	14.5%	3.3%	4.0%	3.2%	2.6%	4.7%	3.9%	50.1%	50.6%	22.9%	24.3%	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.
***Air Force budget numbers also include the DOD share of the NPOESS budget

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

<u>AGENCY</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>% CHANGE</u>	<u>% of FY 2008 TOTAL</u>
Agriculture	274	275	0.4	2.2
Commerce/NOAA (Subtotal)	5,741	5,753	0.2	46.9
NWS	4,660	4,658	0.0	38.0
NESDIS	876	890	1.6	7.3
OAR	32	32	0.0	0.3
NOS	119	119	0.0	1.0
NMAO	54	54	0.0	0.4
Defense	5,248	5,048	-3.8	41.2
Air Force (Subtotal)	4,313	4,266	-1.1	34.8
Air Force Weather	4,194	4,147	-1.1	33.8
DMSP	119	119	-0.0	1.0
Navy	571	413	-27.7	3.4
Army	364	369	1.4	3.0
Homeland Security (Subtotal)	108	108	0.0	0.9
USCG	108	108	0.0	0.9
Interior/BLM (Subtotal)	28	28	0.0	0.2
Interior	26	26	0.0	0.2
Reimbursed**	2	2	0.0	0.0
Transportation (Subtotal)	1,306	1,154	-11.6	9.4
FAA	1,302	1,150	-11.7	9.4
FHWA	4	4	0.0	0.0
EPA	0	0	0.0	0.0
NASA	0	0	0.0	0.0
NRC	1	2	100.0	0.0
TOTAL	12,598	12,260	-2.7	100.0*

* Column total may not exactly equal 100 percent due to rounding for several agencies.

** "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 2007. 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

NESDIS will transfer a total of \$310.2 million to NASA for procurement and launches of polar-orbiting (\$64.5 million) and geostationary (\$245.7 million) satellites.

DEPARTMENT OF DEFENSE

The Air Force will reimburse DOC a total of \$20.7 million for operations [e.g., DMSP operations (\$11,121 million), OFCM support (\$405,000), Lightning Data (\$225,000), NCEP operations (\$140,000), WSR-88D support (\$3,649,000), geomagnetic data (\$2,926 million), and IPO support (\$220,000)]. In addition, the Air Force will reimburse NASA \$148,000 for a variety of data and USGS \$247,000 for the purchase of magnetometer data support.

The Navy will reimburse DOC \$230,000 for basic climatological analysis and forecasting, and interagency coordination.

The Army reimbursements to DOC/NOAA include \$570,000 from

COE to NWS for maintaining precipitation reporting stations. The U.S. Geological Survey will also be reimbursed \$547,000 by the Army's COE for operations and maintenance of hydrologic and precipitation reporting stations.

DEPARTMENT OF TRANSPORTATION

The FAA will reimburse NOAA \$35.5 million for FY 2007. Included in those funds are development of enhancements and operational support associated with the WSR-88D, ASOS maintenance, the Center Weather Service Units at all Air Route Traffic Control Centers, the World Area Forecast System, meteorology instructors at the FAA, studies and OFCM support. The FAA will also reimburse the DOD a total of \$3.4M for supporting research.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

The Air Force will be reimbursed a total of \$1.625 million--\$1.520 million for observations, forecasts, and operations/maintenance of weather infrastructure and replacement of upper air systems at Trans-Atlantic Abort Landing Sites and \$105 million for operation and maintenance of weather towers at Edwards AFB, CA. The UCAR will receive \$15,000 for data analysis to improve lightning launch commit criteria. The National Data Buoy Center will receive reimbursements of \$116,000 for the operation of two data

buoys.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

NOAA's Air Resources Laboratory (ARL) will receive \$6.7 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 enjoys a unique relationship with the DOE as a result of the Energy Reorganization Act of 1974. The act realigned the Atomic Energy Commission into a regulatory organization-NRC and a research and promotional organization-ERDA (which was subsequently absorbed into DOE). As a result, the NRC has access to the DOE national laboratories for technical assistance activities. This assistance, while not a reimbursable agreement, results in the transfer of funds from NRC for specific technical assistance by DOE laboratories. In FY 2007, the NRC expects to task DOE laboratories and the National Oceanic and Atmospheric Administration's National Climatic Data Center at a funding level of \$120,000.

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

<u>Agency Funds Transferred from:</u>	<u>Agency Funds Transferred to:</u>	<u>FY 2007 Funds (\$K)</u>	
		<u>Operations</u>	<u>Supporting Research</u>
Commerce/NOAA	NASA (Polar satellite acquisition)	64,512	
	NASA (Geo satellite acquisition)	245,731	
Defense/Air Force	NOAA(DMSP Satellite Operations)	11,121	
	DOC/NOAA/NWS (NEXRAD)		200
	DOC/NOAA/NWS (NEXRAD)	3,649	
	DOC/NOAA/NWS (ASOS)		138
	DOC/NOAA/NWS (ASOS)	431	
	DOC/NOAA (Shared Processing Network)	710	
	DOC/NOAA/NWS/NCEP(NCEP Communication Circuit Support)	140	
	DOC/NOAA (COMET)		30
	DOC/NOAA/NWS (Lightning Detection System)	225	
	DOC/NOAAOFCM	405	
	DOC/NOAA/NESDIS/IPO (DMSP: Activation of DOMSAT)	220	
	USGS (Dept. of Interior) (USGS Magnetometer)	247	
	NASA (JPL Tech Data)	148	
	DOC/NOAA/SEC (ACE Radian / Data Geomagnetic)	2,926	
	DOC/NOAA/NWS (HAWCNET)	873	
	NSF (Universal Center for Atmos Research)		279
	NSF/UCAR/NCAR (WRF)		461
	NSF/UCAR (Data Assimilation)		445
	DOC/NOAA/ESRL (WRF)		15
	NASA (Land Information System)		125
Defense/Navy	DOC/NOAA/NCDC	45	
	DOC/NOAA/OFCM	185	
Defense/Army	DOD/USAF/ACC	160	
	NSF		46
	DOC/NOAA/NWS	570	
	DOI/USGS	547	
	DOC/NOAA/OFCM	65	

TABLE 2.7 INTERAGENCY FUND TRANSFERS FOR METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH (Continued)

<u>Agency Funds Transferred from:</u>	<u>Agency Funds Transferred to:</u>	<u>FY 2007 Funds (\$K)</u>	
		<u>Operations</u>	<u>Supporting Research</u>
Transportation/FAA	DOC/NOAA	35,500	
	DOD/USAF		3,400
	DOC/NOAA/OFCM	200	
Transportation/FRA	DOC/NOAA	289	
NASA	DOD/USAF/45th SW	1,520	
	DOD/USAF/Edwards AFB	105	
	DOC/NOAA/NDBC	116	
	UCAR		15
EPA	DOC/NOAA/OAR		6,700
NRC	DOE/PNNL	120	

TYPE OF OBSERVATION/AGENCY	No. of Locations (FY 2007)
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Polar meteorological satellites (No. operating)

Commerce (2 primary, 4 standby)	6
Air Force (2 primary, 3 standby)	5
Navy (WINDSAT and GFO)	2

Field Mills (Surface)

NASA (KSC)	31
Stennis	2

Lightning Detection Systems

Air Force (Eastern Range) (Cloud - Ground)	1
Air Force (Eastern Range) (National Lightning Detection Network Licensed Display)	1
Air Force (Western Range) (Cloud - Ground)	1
Kennedy Space Center (4D Total Lightning)	1

