BUDGET ACTIVITY: NATIONAL ENVIRONMENTAL SATELLITE SERVICE

The budget proposes to rename the National Environmental Satellite, Data, and Information Service to the National Environmental Satellite Service, reflecting the proposed transfer of data and information management archive activities to the new Climate Service line office.

For FY 2012, NOAA requests an increase of $727,891,000 and 0 FTE over the FY2010 enacted, after the technical transfer of programs to the new Climate Service, for a total of $2,015,426,000 and 558 FTE for the National Environmental Satellite Service (NESS). The requested funding includes $2,337,000 in inflationary adjustments. The technical transfer associated with the creation of the new Climate Service line office includes $108,365,000 and 258 FTE associated with the line items listed below in the Significant ATB section. Additionally, as part of this re-organization, $2,622,000 and 11 FTE is proposed to be transferred for the NOAA Library to the Office of the Chief Information Officer.

BASE JUSTIFICATION FOR FY 2012:

As the NOAA satellite service, NESS is responsible for the procurement, launch, and operation of the nation's civil operational environmental satellites. Along with providing for the health, safety and management of the satellites, NESS manages the product development and distribution of the corresponding data.

NESS has one sub-activity in the Operations, Research and Facilities appropriation: Environmental Satellite Observing Systems.

The goals of the Environmental Satellite Observing Systems sub-activity include: (1) maintaining a system of polar-orbiting satellites to obtain global environmental data; (2) maintaining a system of geostationary satellites to provide near-continuous environmental observations of the Earth's Western Hemisphere; (3) acquiring, processing, and analyzing data from NOAA, the Department of Defense (DoD), and other Earth-observing satellites; (4) supplying data, interpretations, and consulting services to users; (5) introducing new technology and processes to improve environmental satellite system capabilities; (6) determining requirements for future satellite systems; (7) serving as the lead U.S. agency for the Search and Rescue satellite system, including operating and maintaining the mission control center; (8) monitoring global sea ice conditions to support safe and effective marine transportation; and (9) demonstrating better ways to use and distribute environmental data from NOAA, the National Aeronautic and Space Administration (NASA), and other satellites, aircraft, and laboratory investigations.

The Environmental Satellite Observing Systems sub-activity ($112,827,000 and 409 FTE) includes the following:

- Satellite Command and Control, including NOAA Satellite Operations Facility (NSOF) operations;
- Product Processing and Distribution;
- Product Development, Readiness, and Application, including Ocean Remote Sensing and the Joint Center for Satellite Data Assimilation (JCSDA);
- Commercial Remote Sensing Licensing and Enforcement;
- Office of Space Commercialization; and
- Group on Earth Observations (GEO).

NESS has two sub-activities in the Procurement, Acquisition and Construction appropriation: 1) Systems Acquisition and 2) Construction.

The Systems Acquisition sub-activity ($1,174,007,000 and 149 FTE) includes:

- Geostationary Systems – N Series;
- Geostationary Systems – R Series;
- Polar Orbiting Systems – POES;
- Altimetry Mission – Jason-3;
- Polar Orbiting Systems – Joint Polar Satellite System;
- Critical Single Points of Failure (CIP);
- NPOESS Preparatory Data Exploitation; and
- Restoration of Climate Sensors

In FY 2012, the NESS Construction sub-activity consists of the budget line item Satellite CDA Facility ($2,228,000 and 0 FTE).

Proposed Reorganization to establish a Climate Service line office:

The following reorganization adjustments are requested to transfer the NESS climate functions that provide the necessary support and expertise for the new Climate Service to become fully functional. This will allow NESS to focus on the operations and maintenance of NOAA's critical satellite infrastructure. It will also allow the Data Centers to align their climate work with the climate research and climate services communities within and external to NOAA. These reorganization adjustments for NESS would include the movement of the following NESS functions and activities to the Climate Service: Data Centers, Regional Climate Centers, Coastal Data Development and Environmental Data Systems Modernization program, part of GOES- N, EOS & Advanced Data Processing, Distribution & Archiving System, and CLASS.

As part of NOAA's effort to better manage its resources, additional transfers are requested to move the NOAA Library and the NESS Radio Frequency Management Division to Office of the Chief Information Officer.

Research and Development Investments:

The NOAA FY 2012 Budget estimates for its activities, including research and development programs, are the result of an integrated requirements-based strategic planning process. This process provides the structure to link NOAA's strategic vision with programmatic detail and budget development, with the goal of maximizing resources while optimizing capabilities. NESS requests $28,435,000 for investments in R&D and infrastructure to support R&D in the FY 2012 Budget.

NOAA's strategic planning process makes specific reference to the objectives and milestones outlined in the NOAA 5-Year Research Plan for 2008-2012. The strict management of planning against these investment criteria, objectives, and milestones leads to NOAA budget proposals that reflect the research and development needs of the organization. The NOAA Research Council - an internal body composed of senior scientific personnel from every line office in the agency - is tasked with developing the 5-Year Research Plan, and provides corporate oversight to ensure that NOAA's research activities are of the highest quality, meet long-range societal needs, take advantage of emerging scientific and technological opportunities, and shape a forward-looking research agenda.

Significant Adjustments-to-Base (ATBs):

NOAA requests a net increase of 0 FTE and $2,337,000 to fund adjustments to current programs for NESS activities. The increase will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Service Administration (GSA).

NOAA requests the following transfers for a net change of $0 and – 273 FTE.

From Office	Line	To Office	Line	Amount ($000)
NESS	Archive, Access, & Assessment	CS	Observations & Monitoring - Climate Data & Information Services	$28,189/ 119 FTE
NESS	Archive, Access, & Assessment	CS	Observations & Monitoring - Ocean Data & Information Services	$9,319/ 39 FTE
NESS	Archive, Access, & Assessment	CS	Observations & Monitoring - Geophysical Data & Information Services	$5,946/ 48 FTE
NESS	Archive, Access, & Assessment	CS	Integrated Climate Service - Regional Services	$0/ 3 FTE
NESS	Climate Data Base Modernization	CS	Observations & Monitoring - Climate Data & Information Services	$21,179/ 10 FTE
NESS	Coastal Data Development	CS	Observations & Monitoring - Ocean Data & Information Services	$4,559/ 16 FTE
NESS	Regional Climate Centers	CS	Integrated Climate Service - Regional Services	$3,500/ 0 FTE
NESS	Environmental Data Systems Modernization	CS	Observations & Monitoring - Environmental Sciences	$9,511/ 0 FTE
NESS	Environmental Data Systems Modernization	CS	Observations & Monitoring - Climate Data & Information Services	$0/ 23 FTE
NESS	Integrated Environ Applications & Info Ctr	CS	Observations & Monitoring - Environmental Sciences	$3,000/ 0 FTE
NESS	NOAA Regional Climate Center program	CS	Observations & Monitoring - Environmental Sciences	$850/ 0 FTE
NESS	GOES- N (PAC)	CS	Observations & Monitoring – Data Center Modernization (PAC)	$2,846/ 0 FTE
NESS	CLASS (PAC)	CS	Observations & Monitoring - CLASS (PAC)	$18,476/ 0 FTE
NESS	EOS & Advanced Polar Data Processing, Distribution & Archiving Systems (PAC)	CS	Observations & Monitoring – EOS & Advanced Polar Data Processing, Distribution, & Archiving Systems (PAC)	$990/ 0 FTE
			TOTAL	**$108,365/ 258 FTE**

NESS requests a technical adjustment to move $108,365,000 and 258 FTE from NESS to the Climate Service (CS). These funds will be used to support the establishment of the Climate Service.

From Office	Line	To Office	Line	Amount
NESS	Archive, Access, & Assessment	PS	NOAA Wide Corporate Services & Agency Management Base	$2,622/ 11 FTE

NESS also requests a technical adjustment to move $2,622,000 and 11 FTE from NESS to Program Support, Office of the Chief Information Officer. These funds will be used to support the NOAA Library.

From Office	Line	To Office	Line	Amount
NESS	GOES- N (PAC)	PS	NOAA Wide Corporate Services & Agency Management Base	$810/ 4 FTE

NESS also requests a technical adjustment to move $810,000 and 4 FTE from NESS to Program Support, Office of the Chief Information Officer. These funds will be used to support the Radio Frequency Management Division.

Other Adjustments:

The NOAA FY 2012 Budget for NESS also requests other adjustments in the amount of $2,104,000 to restore funds related to the Promote and Develop (P&D) account as provided in the FY 2011 annualized Continuing Resolution. The P&D transfer represents funds derived from duties on imported fisheries products and are transferred to NOAA from the Department of Agriculture. The annualized FY 2011 Continuing Resolution provided $36,056,800, including carryover, less than requested in the budget due to a downturn in the international fisheries markets. To address a difference between estimated and actual transfer amounts, NOAA has spread the reduction to each of its seven line offices, taking a 1.06 percent reduction to each PPA. With this adjustment, NOAA seeks to restore ORF amounts for NESS back to the requested amount.

From Office	Line	To Office	Line	Amount
NESS (ORF)	All	NESS (ORF)	All	$2,104,000

Administrative Cost Savings:

The Administration is pursuing an aggressive government-wide effort to curb non-essential administrative spending called the Administrative Efficiency Initiative (AEI). In order to be good stewards of taxpayer money, the Federal Government will continue to seek ways to improve the efficiency of programs without reducing their effectiveness. As such, the President directed each agency to analyze its administrative costs and identify savings where possible. After reviewing its administrative costs, the National Environmental Satellite Service (NESS) has identified $11,948,000 in administrative savings. NESS has targeted a number of areas to achieve these savings, at both the Line Office Headquarters level and throughout the program offices. Using NOAALink, NESS anticipates saving money through more strategic sourcing of products and services. Consolidation of products will enable buying in bulk to reduce prices. Consolidation of services will result in dollar

savings by reducing the number of contracts to be managed. In the area of human capital, NESS expects to reduce its costs by holding vacant positions open for longer periods and eliminating some administrative positions. Administrative savings in the area of logistics plans and in general administrative support have been identified by limiting of the use of overnight mail services as well as consolidating services through a single provider. NESS has also identified savings tied to IT related items, primarily through delaying the refresh of computer equipment and eliminating redundant software licenses. In addition, NESS is planning to reduce costs through business process reengineering efficiencies, and by reducing travel to only support mission essential events. The $11,948,000 in administrative savings identified above represent real reductions to the National Environmental Satellite Service's funding level and will help reduce overall spending by the Federal government.

Headquarters Administrative Costs:

In FY 2012, NESS Line Office headquarters will use $22,418,977, after instituting planned savings as a result of the AEI mentioned above, to support general management activities, financial and budgeting, and IT related expenses, as well as supporting facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the General Services Administration. As part of the AEI, NESS has reviewed its Line Office Headquarters costs and will be able to reduce previously planned costs by $2,031,600. Specifically, NESS will use headquarters administrative funds to support the following:

Headquarters Program Support Type	**Description**	**FY 2012 Amount**	**FY 2012 FTE associated with NESS Line Office HQ**
General Management & Direction	Includes Assistant Administrator's office, public affairs, information services	$8,233,700	32.9
CFO Operations	Includes Budget, Finance and Accounting	$2,983,200	9.1
CIO Operations	Includes IT-related expenses and other CIO related activities	$ 9,494,800	10.0
CAO Operations	Includes Facilities and Security costs, as well as other CAO related activities	$1,758,577	0
Human Resources	All HR services, including Equal Employment Opportunity	$1,980,300	11.5
Procurement services, Acquisitions, and Grants Management Operations		$0	0
Total before AEI savings		**$24,450,577**	**63.1**
AEI Savings		*($2,031,600)*	-
Total post AEI savings		**$22,418,977**	**63.1**

NOAA recognizes the need to improve the transparency of the policies and procedures used by its line office headquarters to bill component programs for management and administrative services. NOAA is currently re-evaluating, standardizing, and documenting these policies and procedures for

each line office. Prior to the beginning of FY 2012, NOAA will publish its policies and procedures for assessing headquarters and administrative costs within the line offices on the NOAA CFO public website along with other budget and finance documents. NOAA looks forward to working with the Congress and other interested parties to increase the transparency and confidence in NOAA's financial management.

APPROPRIATION: OPERATIONS, RESEARCH AND FACILITIES
SUBACTIVITY: ENVIRONMENTAL SATELLITE OBSERVING SYSTEMS

The objectives of Environmental Satellite Observing Systems are to:

- Provide secure and efficient command and control of NOAA, DoD, and other non-NOAA operational environmental satellites; and
- To ensure timely and uninterrupted delivery of data to users

To achieve these objectives, NOAA meets the Nation's requirement to provide an environmental satellite system capable of providing timely and accurate environmental data. Early warning of major weather events saves countless lives and prevents substantial property damage. Billions of dollars in damage and hundreds of lives are lost each year due to natural disasters. These losses would be significantly worse if NOAA satellite data and services were unavailable due to interference with, or the failure of, critical satellite command and data acquisition infrastructure.

SATELLITE COMMAND AND CONTROL (http://www.oso.noaa.gov/)
The goal of the Satellite Command and Control program is to provide efficient and secure command and control of NOAA, DoD, and other non-NOAA operational environmental satellites to ensure timely and uninterrupted delivery of data to users.

The NOAA Satellite Command and Control program forms the backbone of the ground systems that command, control, and acquire data from NOAA's on-orbit satellites 24 hours per day, 365 days per year. The Satellite Command and Control program monitors satellite health and safety; schedules satellite operations and data acquisition to meet user needs; evaluates satellite systems performance; commands spacecraft; supports NASA during launch, activation, and evaluation of new satellites; and assesses satellite and ground station anomalies. The NOAA Satellite Command and Control program ensures acquisition and near real-time delivery of satellite data to product processing centers that, in turn, support NOAA's National Weather Service (NWS) mission to protect lives and property during severe weather events.

The Satellite Operations Control Center (SOCC)/Command and Data Acquisition (CDA) Facilities command and control both NOAA and non-NOAA environmental satellites; track the satellites health and safety; acquire and process all data delivered from the satellites; and pass these data to other NESS offices, primarily the Office of Satellite Data Processing & Distribution (OSDPD). The SOCC/CDA provides the vital link between the satellites and every data user. SOCC/CDA operations provide uninterrupted availability of critical information and support NOAA's critical national support functions that are not available commercially, such as real-time hurricane support.

NOAA Satellite Operating Facility (NSOF) Operations -
The NOAA Satellite Operations Facility (NSOF) provides a modern, state of the art facility and infrastructure that supports uninterrupted 24-hours, 7-days a week command, control and communications for NOAA's satellite program operations . The NSOF houses high technology equipment, including 16 antennas, which control Geostationary Operational Environmental Satellites (GOES), Polar-orbiting Operational Environmental Satellites (POES), and DoD's Defense Meteorological Satellite Program (DMSP) environmental satellites. Data from other non-NOAA operational and research satellites are also received to support specific NOAA missions. In addition to satellite operations, the 24/7 critical operations at NSOF provides environmental data used to develop weather and climate products, as well as other information products used daily by industry and citizens across the Nation.

Schedule & Milestones:

Command & Control	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16
Launch Readiness/ On-Orbit Checkout		DMSP F-19 Launch/ Operation Handovers			GOES-R Launch/ Operation Handovers	DMSP F-20 & JPSS-1 Launch/ Operation Handovers
Contract Award	Fairbanks Command Data Acquisition Station Operations and Maintenance			Engineering Mission Operations Support Service Contract re-compete		

Deliverables:

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16
Percentage of GOES satellite data successfully acquired to meet customer quality and timeliness requirements.	99.0	99.0	99.0	99.0	99.0	99.0
Percentage of POES satellite data successfully acquired to meet customer quality and timeliness requirements.	99.0	99.0	99.0	99.0	99.0	99.0
Infrastructure Maintained # of National/Mission Critical Systems)	8	8	8	8	8	8
# of NOAA Managed Satellites	17	18	18	19	19	21
# of Non-NOAA Satellites Supported	12	12	12	12	12	12

Performance Goals and Measurement Data

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
% of satellite data received, processed, and distributed	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%
Description: This measure includes observations from the primary polar and geostationary spacecraft tracked from observation through availability to the user.						

PRODUCT PROCESSING AND DISTRIBUTION (http://www.osdpd.noaa.gov/ml/index.html)

The goal of the Product Processing and Distribution (PP&D) program is to provide the Nation with specialized expertise and computing systems that process, analyze, and distribute satellite-derived products and services that protect U.S. lives and property while enhancing the Nation's environmental, national, homeland, and economic security. PP&D processes data from Earth-observing satellites to provide the highest quality products and services to its users.

PP&D provides satellite-derived products and services using data from NOAA, the Department of Defense, and NASA environmental satellites, as well as foreign and commercial spacecraft; to national and international customers and users on a 24 hours-per-day, 7 days-per-week basis. PP&D products enable NOAA to accurately track the location, extent, and duration of severe weather such as hurricanes, tornadoes, and winter storms; support development of flash flood warnings; track volcanic ash clouds and severe winds that threaten aviation safety; detect remote wild land fires; monitor coastal ecosystem health; identify and monitor maritime hazards from sea ice; and assist in search and rescue activities. PP&D is the operational interface with NOAA's National Weather Service (NWS) and supplies the satellite data that makes up more than 99 percent of the information used in numerical weather prediction models. PP&D provides approximately 450 operational products organized into three categories: Atmospheric, Oceanographic, and Terrestrial.

The PP&D program is constantly assessing and using data from advanced satellite sensors to improve operational support to its customers. It also supports activities to improve the effectiveness and interoperability of national systems for sharing natural disaster information. By using maps and data generated by remote- and land-based sensors, this information is made widely accessible to all government agencies and other entities involved in managing and mitigating the impacts of disasters. PP&D products are widely used by all branches of the U.S. Armed Services and the Department of Homeland Security.

Included in the PP&D operations is NOAA's contribution to the joint U.S. National Ice Center (NIC), which monitors global sea ice conditions to support safe and effective maritime transportation in the Polar Regions, Great Lakes, Arctic, and North Atlantic waters. NOAA, the U.S. Navy, and the U.S. Coast Guard jointly operate the U.S. NIC to support the civil and military maritime communities. This service is critical to NWS warnings in ice-prone sea lanes, U.S. Coast Guard ice breaking missions, civilian and military shipping, and commercial fishing communities.

PP&D provides NOAA's contribution to the operations of the U.S. search and rescue satellite-aided tracking (SARSAT) system. SARSAT has contributed to the rescue of more than 28,000 people worldwide, including more than 6,000 people in the United States, since its inception in 1982.

Schedule & Milestones:

- FY12: Implement Metop-B products into operations
  - Complete Certification and Accreditation of Satellite Image Processing and Analysis System
  - Implement GOES-14 products into operations
- FY13: Complete transition of Interactive Multi-sensor Snow and Ice Mapping System V.3 into operations
  - Transition upgraded Southern Hemisphere Automated Snow and Ice Mapping system into operations

- FY14:Complete Certification and Accreditation of product processing system

- FY15: Implement GOES-15 products into operations FY16: Test and validate product processing capability for GOES-R and Metop-C

Deliverables:

- Transition new products into operations
- Upgrade system architecture to meet security needs and to facilitate transition of research products into operations
- Provide product continuity for GOES and POES products

Performance Goals and Measurement Data

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
% of NOAA-managed Satellite Data ingested, processed and distributed within targeted time	98	98	98	98	98	98
Description: This measure includes observations from the primary polar and geostationary spacecraft tracked from observation through availability to the user. This measure is used to track timeliness and customer satisfaction. The targeted time varies per satellite: GOES is 15 minutes, POES is 180 minutes (which is based on Advanced TIROS Operational Vertical Sounder timeliness), and DMSP is 2 to 3 hours.						

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Number of product transition from research to operations	14	20	20	20	30	40
Description: This measures the number of validated products (both new and enhanced) that are transitioned from research into operations. Efficiency in managing Research To Operation program resources is reflected by the number of new satellite products that are developed and implemented within the defined schedule and cost criteria for each separate product project.						

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Delivery percentage quality ice products	97	97	97	97	97	97
Description: Imagery required by the National Ice Center (NIC) to generate critical ice forecast and other ice products needed for safe marine transportation.						

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Transmission percentage rate of SARSAT distress alert and location information to search and rescue	93	93	93	93	93	93

authorities within targeted time						
Description: Performance measure is important to beacon user customer group. The ability to deliver distress alerts in a timely fashion directly affects the chances of survival for the individual(s) in distress. Baseline performance was derived from historical data. The target performance is included in the Interagency SARSAT Operational Requirements document.						

PRODUCT DEVELOPMENT, READINESS & APPLICATION
(http://www.star.nesdis.noaa.gov/star/index.php)

The goal of NOAA's Product Development, Readiness, and Applications (PDR&A) program is to provide applications-focused research that will develop and evaluate prototype products, algorithms, and pre-operational products to improve existing operational satellite products and services using data from current and next generation environmental satellites.

PDR&A enhances the accuracy of current satellite products and develops new satellite products to meet user requirements. Activities range from planning new satellite instruments to developing new satellite products and applications. This includes transitioning new satellite products to operations, improving satellite products as instruments degrade, and performing calibration/validation activities between instruments.

The Nation needs enhanced satellite data, to improve and extend weather forecasts, expand environmental monitoring and assessment capabilities, and to provide new and improved tools for scientifically based ecosystems management. In the next few years, the number and quality of satellite instruments will grow significantly, providing enhanced data capable of allowing major improvements in weather prediction accuracy. To make these improvements, it is necessary to have both a targeted research program and a cadre of scientists and computing systems dedicated to development of improved satellite data products. The PDR&A activity ensures the highest accuracy of NOAA's current operational environmental satellite data and products via a robust and rigorous satellite data calibration/validation program. This effort improves product quality for the benefit of all users. PDR&A also incorporates the latest academic findings into its work through competitively awarded Cooperative Institutes with academic institutions (Universities of Wisconsin, Maryland, Colorado State, Oregon State, and the City College of New York). The academic expertise and the results of academic findings are infused into product development, readiness, and applications that either lead to improvements in existing products or to the development of new products or sensors.

Ocean Remote Sensing (ORS): ORS targets the development of ocean related products and their transition to operations. Its scope includes developing new and improved ocean remote sensing data, products, and capabilities; ensuring continuity of data streams and specifying requirements for next generation satellite sensors; improving the understanding of ocean dynamics; and addressing research and operational needs related to marine ecosystems.

ORS facilitates the delivery and implementation of multiple satellite ocean data streams with continued science maintenance and improvements in research, data acquisition, calibration, and validation, which are required to maintain and enhance satellite-based tools and products utilized by the global and coastal oceans user community. Major activities under ORS include CoastWatch/OceanWatch (including Marine Optical Buoy support)**,** External Research (Cooperative Institute for Oceanographic Satellite Studies), Sea Surface Roughness, and Sea Surface Temperature.

Joint Center for Satellite Data Assimilation (JCSDA): JCSDA increases forecast prediction capabilities using advanced satellite assimilation methods. Its scope is to accelerate and improve the quantitative use of research and operational satellite data in weather, ocean, climate and environmental analysis and prediction systems.

JCSDA accelerates the application of satellite data for improving weather forecasts and other environmental models. The JCSDA was established to speed the development of new satellite data assimilation science into operational capabilities. NOAA (NWS, OAR, and NESS), NASA, and DoD are partners in this coordinated national effort to more fully realize the potential of the vast quantities of new satellite data that are becoming available. The JCSDA is also a risk reduction measure designed to accelerate the Joint Polar Satellite System and GOES-R data utilization for the development of numerical weather prediction models and forecast models that will lead to increased accuracy and longer-range forecasts. In the next few years, the number and quality of satellite instruments will grow significantly, providing an exponential increase in higher quality data capable of allowing major improvements in the accuracy of weather prediction.

Schedule & Milestones:

- FY11: GOES-R Level-2 Products developed
- FY12: Implement experimental oil spill mapping products
  Initial validation of NPP instruments
- FY13: Development of NDE NOAA-unique products
  Data assimilation experiments of NPP observations
- FY14: Jason-3 calibration program established
  Data exploitation of GCOM-W1 mission
- FY15: Provision of near-realtime ocean surface wind data to the National and Central Pacific Hurricane Centers
- FY16: Post-launch checkout of GOES-R

Deliverables:

- FY11: GOES-R Level-2 product capability
- FY12: Experimental oil spill mapping product
  NPP instruments validated
  Experimental NPP data assimilated into models
- FY13: NDE NOAA-unique product capability
- FY14: Product algorithm capability from GCOM-W1 mission
- FY15: Near-realtime ocean surface wind data for nowcasts, forecasts, and warnings
- FY16: GOES-R Post-launch capability tested

Performance Goals and Measurement Data

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Number of products, applications, techniques, and systems developed	8	8	10	10	10	10
Description: As new requirements for satellite data and environmental information are identified and understood, research is performed that leads to the creation of new information products, applications, processing techniques, and systems.						

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Number of new satellite products transitioned to operations	20	20	22	23	25	25
Description: To apply its research to operational needs, satellite information products are developed and tested that meet the requirements of customers (e.g. the National Weather Service). After an extensive evaluation, the products that satisfy the requirements are transferred to operations for customer use.						

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Number of refereed papers published	75	75	75	80	80	80
Description: To assure that research is valid, high-quality, and up-to-date, scientific results are published in peer-reviewed journals.						

COMMERCIAL REMOTE SENSING REGULATORY AFFAIRS (CRSRA)
(http://www.licensing.noaa.gov/): The Nation requires a consistent and transparent regulatory process for licensing commercial remote sensing space systems in order to promote U.S. technological competitiveness and economic security, while ensuring satellite operation is consistent with our national security, intelligence, and foreign policy needs. NOAA's CRSRA program supports these requirements while furthering the Nation's homeland security and national security missions.

The CRSRA program coordinates interagency review of satellite license applications, amendments, and significant foreign agreements. NOAA licenses commercial remote sensing space systems and performs associated monitoring and compliance pursuant to the Secretary of Commerce's statutory responsibilities. Prior to issuing licenses, NOAA must consult with the Departments of Defense and State to ensure license compliance with national security and foreign policy, respectively. NOAA works closely with other U.S. Government agencies to implement policy and ensure international coordination. Major monitoring and compliance activities supported by NOAA include review of quarterly license reports, on-site inspections, audits, license violation enforcement, and implementation of restrictions during national security and foreign policy crises. The number of license applications and revocations vary each year, and are not predictable. The Department of Commerce's CRSRA through NOAA is responsible for enforcement and ensuring compliance with the terms of the license agreements. Worldwide commercial remote sensing space data sales were estimated to be $735 million in 2007 and are expected to increase to $2.5-$3.4 billion by 2017. Dramatic future growth is expected due to growing civil and military user requirements, improvements in aerospace and information technologies, and e-commerce.

OFFICE OF SPACE COMMERCIALIZATION (OSC)
(http://www.space.commerce.gov/remotesensing/): OSC, managed by NOAA for the Department of Commerce, is responsible for developing space-related policies and promotion of the capabilities of the U.S. commercial space industry. OSC represents the Department of Commerce in negotiations with foreign countries to ensure free and fair trade internationally in the areas of space commerce. OSC assists U.S. commercial providers in their efforts to expand their business with the U.S. Government and promotes commercial provider investment by performing economic analysis on space and space-related markets. OSC identifies commercial

solutions for key NOAA and other civil government data acquisition requirements. OSC also acts as a broad industry advocate within the Executive Branch to ensure the Federal Government uses commercially available space goods and services to meet their requirements, avoids legal and regulatory impediments, and does not compete with the U.S. commercial space industry. The 2004 U.S. Space-Based Positioning, Navigation, and Timing (PNT) Policy established, through Presidential Directive, a permanent National PNT Executive Committee (EXCOM) to manage the Global Positioning System (GPS) and its U.S. Government augmentations as a national asset. The policy further directed the EXCOM to establish the National Space-Based PNT Coordination Office (NCO) to serve as the Secretariat and perform those functions delegated by the Executive Committee. The Deputy Secretary of Commerce is a member of the Executive Committee and OSC provides management, personnel and facility support to the NCO in addition to performing studies and related activities to meet Executive Committee tasking and responsibilities.

GROUP ON EARTH OBSERVATIONS (GEO) (http://www.noaa.gov/eos.html): The intergovernmental Group on Earth Observations (GEO) is a voluntary international partnership of governments and international organizations that provides a framework where these partners can collaborate globally on Earth observations. Its mission is the implementation of a Global Earth Observation System of Systems (GEOSS). The United States government is a founding member of GEO. The Office of Science and Technology Policy, Executive Office of the President, leads U.S. engagement with GEO and the Associate Director for Environment serves as U.S. Principal Representative to and Co-Chair of GEO. U.S. government participation in this international activity is coordinated through the interagency U.S. Group on Earth Observations (USGEO). USGEO facilitates domestic coordination of Earth observation initiatives, as well as engagement with the intergovernmental GEO aimed at advancing U.S. goals and objectives relating to Earth observations.

Program resources support the activities of the GEO Secretariat staff in Geneva, who coordinate the 110 cooperative tasks and subtasks of the GEO Work Plan. The work plan is updated annually, with major revisions every three years. Tasks range from data integration and management, to water cycle observations, to Earth observations for climate change adaptation. Program resources also support the domestic cooperative activities of USGEO, including preparations for U.S. government participation in major GEO meetings and events; the development of assessment reports for the Executive Office of the President; planning and coordination meetings focused on federal agency investments in Earth observations, workshops, and other forums.

Global environmental and resource issues are among the great global challenges of our time. Mitigating and adapting to climate change and supporting global food security through sustainable agriculture are among the most important and demanding of those challenges. Integrated Earth observations are the indispensable foundation for addressing these challenges, of which GEO is a critically important forum for international engagement and cooperation on Earth observations.

The GEOSS endeavor is resulting in unprecedented global access to environmental information, and promises to advance its integration into new data products for the benefit of societies and economies worldwide. It represents a commitment to three important Administration principles: science-based decision making, open access to data and information, and increased international cooperation on science and technology.

Schedule & Milestones:

CRSRA

- FY11-12: Key milestones in the next two years are to contribute as necessary to rewrite the Land Remote Sensing Policy Act of 1992. In addition, provide changes to the associated regulations, 15 CFR Part 960, which occurred in the Law, and changes in the private sector.
- FY13: Evaluate Kyl-Bingaman limits and establish new threshold if determined necessary
- FY14: Evaluate all standard operating procedures to assure effectiveness and address gaps, need for new procedures, or modification of existing procedures as appropriate
- FY15: Examine methodology for licensing of private space systems and determine if the existing license format is relevant or needs to change to better address changes in space systems and their operations
- FY16: Review regulations for currency and update if appropriate, republish any new regulations

Space Commercialization

- FY 12: Support ten major policy decision processes, industry studies, or related activities, approximately two to three per quarter.

GEO

- FY 12: Hosting of the GEO-VIII Plenary and associated Executive Committee meetings

Deliverables:

CRSRA

- Issuance of new licenses, waivers and or amendments to licenses, review and approval of foreign agreements, quarterly and annual audits, annual inspections with appropriate documentation for the record.

Space Commercialization

- Increased opportunities for commercial solutions for key NOAA and other civil government data acquisition requirements.
- Improved coordination between government and industry on space-related issues and enhance engagement in interagency space-related policy activities

GEO

- Advances to data sharing and data access by demonstrating the value of integrated observations to specific end users through improved products and information.

Performance Goals and Measurement Data

CRSRA

Performance Measure:	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
Percent of all regulatory actions processed within statutory time lines	100%	100%	100%	100%	100%	100%
Description: Regulatory actions include the submission of new licenses, the amendment of an existing license (both are a 120 days by law), review, and approval of any waiver to a license or a foreign agreement (60 days).						

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Percent of required audits and inspections completed within established time lines	100%	100%	100%	100%	100%	100%
Description: Audits and inspections are the quarterly and annual review of records, licenses, data protection plans and agreements, and the annual onsite inspection of the company and any station associated with the collection of satellite data. It is the verification for enforcement.						

Space Commercialization

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Number of major policy decisions supported and industry studies and related activities executed	10	10	10	10	10	10
Description: The target represents actions planned to be executed during the year that deal with commercial space issues and industry studies of the market.						

PROGRAM CHANGES FOR FY 2012:

Product, Processing and Distribution: IT Security - (Base Funding: 0 FTE and $2,600,000; Program Change: +0 FTE and +$3,108,000): NOAA requests an increase of 0 FTE and $3,108,000 for a total request of 0 FTE and $5,708,000 to implement mandated security controls over the most critical IT assets in the NESS Portfolio. NOAA's environmental data and products are used as input to daily weather forecasts, hurricane tracking, and the nation's public weather warnings which directly support NOAA's mission. NOAA must protect its computing systems that collect and distribute environmental data to minimize disruptions in service. Disruptions in these vital services could lead to loss of life, injury, and damage to the economy.

Proposed Actions
Several IT security infrastructure requirements were largely unrecognized until the implementation of a markedly more rigorous Certification and Accreditation process in FY 2005. Since the original identification of this issue, requirements have continued to escalate. The requested funds will be used to address the most critical IT assets in the NESS portfolio and are intended to fund the implementation of the National Institute of Standards and Technology (NIST) and Federal Information Processing Standard (FIPS) 200 minimum required security controls on an annual basis. These security controls are mandated and cannot be waived. NESS has worked to improve its IT security program, but without additional funding, the security program is incomplete and will not adequately secure NESS information, assets, and services.

The funds will be used to perform annual IT system mandatory continuous monitoring and periodic certification and accreditation compliance; provide the ability to mitigate risk for the integrity and availability of NOAA's polar and geostationary satellite data; support compliance with the Federal Information Security Management Act (FISMA) and Department of Commerce IT security policies; and certification and accreditation or continuous monitoring of three non-critical systems.. The request ensures that NOAA can meet its core mission to command and control operational environmental satellites and to protect the computational resources necessary to ingest, process, and disseminate environmental satellite data and products. Specifically, funding will provide for continued configuration management of hardware and software; update, operation and maintenance of system security tools and controls; intrusion detection/prevention; incident handling, including rapid response to cyber security incidents; implementation of polices and standards; and system reporting to track and mitigate risk to system integrity. This work will be accomplished using contractors. Systems are located at the NOAA Satellite Operations Facility (NSOF) in Suitland, MD, and the Command and Data Acquisition Stations (CDAS) in Wallops, Virginia and Fairbanks, AK.

With these funds, the Environmental Satellite Processing Center (ESPC) will annually undergo continuous monitoring and upgrade IT Security of the NOAA/NESS Satellite Operations Facility (NSOF) in Suitland, MD. In addition, Satellite Operations Control Center/Command and Data Acquisition (SOCC/CDA) at the NOAA NSOF, the Wallops, VA and Fairbanks, AK Command and Data Acquisition Stations (CDAS) will receive funds as part of its continuous monitoring requirements and the IT Security upgrade for NOAA/NESS IT operations.

Statement of Need and Economic Benefits
The Department of Commerce Inspector General has identified a material weakness in the area of IT security across the Department. The visibility of these national critical systems highlights the importance of removing this material weakness. Currently, NESS is forced to accept a high degree of risk for its operational mission critical systems.

All NOAA national systems must be in full compliance with the Federal Information Security Management Act (FISMA); Clinger Cohen Act; Office of Management and Budget (OMB) Circular A-130, Appendix III; Security of Federal Automated Information Resources; National Institute of Standards and Technology Publications/Guidance and Federal Information Processing Standards; and the Department of Commerce IT Security Policies. NESS has diligently labored to improve its IT security program. This funding addresses the most critical requirements for an acceptable IT security posture. The bulk of this funding will address particularly vexing problems in implementing legally mandated security controls in a legacy system environment, containing the majority of NOAA's National Critical systems. In addition, these systems make up a major portion of DOC National Critical systems, which provide critical infrastructure services to the American people, and correcting security control inadequacies will have a major impact on the overall security posture of the Department.

The national critical systems this increase will help secure include:

- Environmental Satellite Processing Center (ESPC) – Provides computing resources necessary to produce satellite products used to prepare daily weather forecasts, track hurricanes, and supplies the Nation with public watches and warnings.
- Geostationary Operational Environmental Satellite (GOES) Ground Segment – Provides infrastructure and computing resources necessary to operate the GOES satellites, which are used to provide advanced warnings of thunderstorms, floods, hurricanes and other severe weather.
- Polar-orbiting Operational Environmental Satellite (POES) Ground Segment - Provides infrastructure and computing resources necessary to operate the POES satellites, which are used for a broad range of environmental monitoring applications including weather forecasting, climate research, and monitoring land usage.
- Data Collection System (DCS) – Provides Federal, state and local agencies the ability to monitor the environment through transmission of observations from surface-based platforms through NOAA satellites, and is instrumental in providing emergency managers with early warning of floods and other hazards.
- Constellation Observing System for Meteorology, Ionosphere & Climate (COSMIC) – Joint United States –Taiwan mission whose goal is to gain inexpensive profiles of temperature and moisture across the globe by intercepting GPS signals using a constellation of satellite-based receivers, resulting in improved weather forecasting.
- Jason-2 – Provides command and control computing resources for a four-partner radar altimeter mission to measure sea surface height and sea-level rise, which helps with monitoring climate change.
- Initial Joint Polar System Communication Element (IJPS CE) - Provides infrastructure and computing resources for the communication element for a joint NOAA - European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) mission.
- Satellite Antenna System (SAS) – System containing all satellite services antenna equipment used in the command and control systems.

Base Resource Assessment:
Base resource assessment is provided in the Program Summary for Product, Processing and Distribution.

Schedule & Milestones
- Continuous monitoring on all systems throughout each year
- Conduct annual penetration testing on all systems.

- Complete Plan of Action and Milestone (POA&M) requirements for each system
- Implement and operate security controls to protect systems
- Conduct Certification and Accreditation in accordance with NIST 800-53 standards for NOAA National Critical system ID's in:
    - FY12: Jason-2 (5046), IJPSS CE (5058)
    - FY13: POES (5026), COSMIC (5047), DCS (5004), IJPSS CE (5058)
    - FY14: GOES (5003), ESPC (5045), SARSAT (5023), SAS (5059)
    - FY15: Jason-2 and -3 (5046), IJPSS CE (5058)
    - FY16: POES (5026), SAS (5059), COSMIC (5047), DCS (5004), IJPSS CE (5058)
- Conduct Certification and Accreditation in accordance with NIST 800-53 standards for NOAA Non-Critical system ID's in:
    - FY12: WLAN (5032), SRAS (5038)
    - FY14: FCDAS LAN (5008),
    - FY15: WLAN (5032), SRAS (5038)

Deliverables

- Maintain current Certification and Accreditation packages for all nine national critical systems within the satellite services program consistent with NIST 800-53 requirements.
- Maintain three other non-critical systems

Performance Goals and Measurement Data

Performance Measure: # of NESS National Critical Systems that meet NIST IT Security Compliance Requirements	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
With Increase	8	9	9	9	9	9
Without Increase	8	5	4	3	5	3
Description: IT Security compliance includes: certification and accrediation, continuous monitor, configuration management and security administration.						

Performance Measure: # of Completed Certification and Accreditation or Continuous Monitor of three non-critical systems	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
With Increase	0	3	3	3	3	3
Without increase	0	0	0	0	0	0
Description: Systems require IT system administration, patching and Plan of Action & Milestone (POA&M) mitigation along with independent validation to allow us to maintain our Authority to Operate (ATO).						

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Product, Processing and Distribution
Subactivity: Environmental Satellite Observing Systems

	Object Class	2012 Increase
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	3,108
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	3,108

Product, Processing and Distribution: NPP and Polar Continuity Data Processing and Distribution (Base Funding: 0 FTE and $0; Program Change: +0 FTE and +$3,811,000): NOAA requests an increase of 0 FTE and $3,811,000 for a total of 0 FTE and $3,811,000 to operationalize the processing and distribution of environmental data from the National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) mission. The NPP satellite is scheduled for launch in 2011. The NPP satellite will provide essential continuity of polar environmental observations to the National Weather Service (NWS) and civilian user community. This change will provide for data processing and distribution for NPP and the follow-on polar orbiting satellites called the Joint Polar Satellite System (JPSS).

Proposed Actions:
NOAA will initiate NPP data processing and distribution of environmental products on a 24x7 basis to NOAA Operational Centers, such as the NWS's Environmental Modeling Center, and other NOAA partners in the civilian user community after the NPP launch, currently scheduled for the fall of 2011. This system provides the only link to get near real- time NPP data. Funding provides a capability to process and deliver NPP data, which NOAA will make available for data continuity of polar satellite mission coverage. Funding will generate environmental products from the observational capacity of NPP that will lead to improved daily weather forecasts and warnings, hurricane landfall warnings, harmful algal bloom assessments, and ultimately to reduced annual economic losses due to weather.

Statement of Need and Economic Benefits:
NPP observations will enable the NWS to generate improved forecasts that will save lives and property. Specifically, the NPP products are needed to: 1) Support real-time assessments and short-to-medium range forecasts and warnings of environmental conditions that may endanger human safety and health, and safe transportation; 2) Assess vegetation and drought conditions; 3) Provide information on fire locations and burn areas; 4) Develop ocean products to enhance public health, protected species, fisheries and coastal zone management, recreational boating, the offshore oil/minerals industry, tropical (hurricane) cyclone analyses and; 5) Assess seasonal-to-inter-decadal variability of ocean color and sea surface temperature products for El Nino, La Nina, and Pacific Decadal Oscillation climate analyses.

Base Resource Assessment:
Base resource assessment is provided in the Program Summary for Product, Processing and Distribution.

Schedule and Milestones:
- FY12: Initiate NPP data processing and distribution using NDE Production Environment (PE)
- FY13: Assume full NPP data processing and distribution using NDE PE. Integrate first set of NPP Products into NESS Operations
- FY14: Integrate second set of NPP products into NESS Operations
- FY15: Integrate new JPSS Data Exploitation (JDE) equipment (Production Environment) into Operations.
- FY16: Sign Transition to Operations Plan for JDE Production Environment

Deliverables:
- 57 NPP environmental products: CriS/ATMS (Atmospheric Temperature and Moisture Profiles for NWS); MIRS (Microwave-based moisture products for NWS); SST (Sea Surface Radiances for NWS and Sea Surface Temperatures for NOS/CoastWatch).

Performance Goals and Measurement Data

Performance Measure: Data Products Transitioned to Operational Production/Distribution	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
With Increase	0	9	10	10	14	14
Without Increase	0	0	0	0	0	0

Description: Implement into operations the processing and distribution of environmental data from the NPP mission and other polar missions. Products include microwave and infrared atmospheric soundings, atmospheric ozone, sea surface temperatures, vegetation health, and fire detection.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Product, Processing and Distribution
Subactivity: Environmental Satellite Observing Systems

	Object Class	2012 Increase
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	2,010
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	1,801
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	3,811

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APPROPRIATION: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUBACTIVITY: SYSTEMS ACQUISITION

Geostationary Operational Environmental Satellite Program

The goals of the Geostationary Operational Environmental Satellite (GOES) program are to continue the procurement of spacecraft, instruments, launch services, and ground systems equipment; provide satellite and instrument anomaly support to the on-orbit GOES satellites; and maintain the ground system for GOES satellite operations which is necessary to maintain an uninterrupted flow of environmental data collected from geosynchronous satellites to users.

GOES data provide:

- Cloud images and precipitation estimates for hurricanes and other coastal storms;
- NOAA CoastWatch sea surface temperature (SST) products for locating commercial and sport fish as well as protected marine species;
- New research products, such as ocean surface currents, that support both ecosystems management and safety of marine navigation;
- Primary information in the Nation's Climate Reference Network, providing reference quality data for surface temperature and precipitation monitoring;
- Images of the United States and adjacent ocean areas to enable the detection of hurricanes and other major weather events;
- Data collection from remote fixed in-situ observing platforms such as buoys and rain gauges for use in numerical weather prediction models and flood/drought assessments;
- Weather information to emergency managers for use in times of severe weather and during other disasters;
- A means to obtain quantitative environmental data such as temperature, moisture, wind, radiation and solar energy particle flux for use in weather predictions, hydrometerological flux, climate long term trending, ecosystems management, commercial economic gain, and transportation safety; and
- Unique monitoring capabilities that support air, land, and marine transportation.

The GOES system provides an uninterrupted, continuous flow of data and information that meets customers' spatial, temporal and accuracy requirements, providing significant customer benefit within an established life cycle cost target. The procurement of GOES satellites is a cooperative venture between NOAA and NASA. Historically, NOAA defines requirements, manages, funds, implements system integration, procures ground segments, and operates the GOES satellites. NASA serves as the agency with multi-disciplinary engineering expertise, develops detailed system specifications, procures and launches the spacecraft, and assists NOAA in system integration.

NOAA GOES satellite systems are designed, developed, acquired, and operated as a single end-to-end system. The system includes the observing platform (space-based instruments satellites); command and control of the platform; product generation and distribution; archive and access; and user interface. GOES contributes to an Integrated Global Observation System, is defined as an end-to-end approach linking requirements to services, delivers critical real-time data and information needed for sound decision making, addresses needs to support expanded climate services, and works with global partners.

GOES observations allow continuous monitoring from the same angle during the tracking/detection of severe storms, atmospheric moisture changes, mesoscale scanning, currents flow dynamics, and atmospheric chemicals (particles) that cannot be achieved from a non-stationary orbit without

increased error rates and lost data segments. NOAA maintains an on-orbit spare to complement the two operational GOES satellites. This on-orbit spare philosophy allows NOAA to quickly replace a failed satellite by re-positioning an on-orbit satellite to ensure there is no loss in continuous coverage. To facilitate this strategy, NOAA plans the launch of the next satellite to coincide with the planned switchover of the on-orbit spare to operational status.

GOES-N SERIES (http://www.osd.noaa.gov/GOES/goes_n.htm)

The NOAA GOES program serves the public by generating timely and accurate environmental data, images, and other weather information. A primary function of the GOES program is supporting the NWS in forecasting, tracking, and monitoring severe storms. The improved accuracy of the NWS forecasts by using GOES data results in dissemination of timely weather forecasting and advisories to impacted areas to ensure authorities and the public are equipped with decision-making information to protect lives and property. The GOES-N Series program includes GOES-13, GOES-14, and GOES 15 satellites, launched May 2006, June 2009, and March 2010, respectively.

GOES satellites provide many weather images seen on United States television newscasts every day. The GOES imaging and sounding instruments feature flexible scans for small-scale area viewing in regions of the visible and infrared spectrum allowing meteorologists to improve short-term forecasts. The GOES provides nearly continuous imaging and sounding, which allow forecasters to better measure changes in atmospheric temperature and moisture distributions and hence increase the accuracy of their forecasts. GOES environmental information is used for a host of applications, including weather monitoring and prediction models, ocean temperatures and moisture locations, climate studies, cryosphere (ice, snow, glaciers) detection and extent, land temperatures and crop conditions, and hazards detection.

In April 2010, when tornadoes touched down in Yazoo City, Mississippi, the GOES-N Series of satellites provided images that tracked those tornadoes and thereby facilitated the NWS in issuing timely advisory warnings. Additionally, the GOES produced some of the first images to track smoke from the oil fire, that later became the Deepwater Horizon Oil Spill in the Gulf of Mexico. Scientists and environmentalists used and continue to use the GOES data and images to assess environmental impact to that region.

The GOES program operates a two-satellite constellation in geosynchronous orbit above the equator and observes about 60 percent of the Earth with at least one satellite placed in on-orbit storage. The satellites measure the Earth's atmosphere, its surface, cloud cover, and the solar and geosynchronous space environment; and provide a platform for the Imager, Sounder, Solar X-Ray Imager (SXI), and space environment monitoring instruments. The system also supports land and ocean-based Data Collection Platforms, transmits Imager and Sounder data, relays Low Rate Information Transmission data, relays GOES variable reformatted Imager and Sounder data, relays Emergency Managers Weather Information Network broadcasts and participates in the international Cospas-Search and Rescue Satellite-Aided Tracking (SARSAT) system.

Spacecraft	Date Launched	Operational Date
GOES-13	May 2006	2010-2015
GOES-14	June 2009	2012-2017
GOES-15	March 2010	2015-2020

See the Program Change for the proposed schedule/milestones, deliverables, and budget profile.

GOES-R SERIES (http://www.goes-r.gov/)

The GOES-R program will provide end-to-end system integration through the acquisition, deployment, maintenance, and operations of the space, ground, and launch segments.

The needs and benefits of GOES-R series satellites are as follows:

- Maintains continuous real-time observations for severe storms, hurricanes, and weather monitoring to the Nation;
- Needed as a backup to GOES-14 or15; part of a system of two operational satellites and an on-orbit spare;
- Provides advances in NOAA's observation capabilities for all NOAA mission goals including improvements to coastal, space weather, and lightning observations; and
- Incorporates key enhancements in spatial and spectral information, coverage, and timeliness.

Average annual damage from tornadoes, hurricanes, and floods is $11.4 billion with about 100 deaths annually (Extreme Weather Sourcebook 2001: *Economic & Other Societal Impacts Related to Hurricanes, Floods, Tornadoes, Lightning, and Other U.S. Weather Phenomena***.** Collaborative Program on the Societal Impacts and Economic Benefits of Weather Information, Boulder, CO). Approximately $4 billion per year is lost in economic efficiencies as a result of weather-related air traffic delays (NOAA, 2002: GOES-R Sounder and Imager Cost/Benefit Analysis, NOAA NESS Office of Systems Development, Silver Spring, MD). Lightning causes between $4 and $5 billion in losses each year in the civilian sector with about 47 deaths and 303 injuries per year (NOAA, 2004: GOES-R Sounder and Imager Cost/Benefit Analysis - Phase III. NOAA/NESS/Office of Systems Development, Silver Spring, MD). By helping to produce more accurate forecasts and warnings, the GOES-R series will minimize these losses.

Funding is used for the:

- Continued development of GOES-R & S spacecraft and ground system. The program will continue to work towards the Critical Design Review (CDR) for the GOES-R Series system, for both spacecraft and ground system;
- Continuation of instruments already under contract: Advanced Baseline Imager (ABI), Solar Ultra Violet Imager (SUVI), Extreme Ultra Violet Sensor/X-Ray Sensor Irradiance Sensor (EXIS), Space Environmental In- Situ Suite (SEISS), and Geostationary Lightning Mapper (GLM);
- Continued funding of flight models and spares for each instrument in FY 2012 and product algorithm development for the ABI Instrument for GOES-R and GOES-S satellites; and
- Continuation of the ground system antenna contract.

Spacecraft	Launch Readiness Date	Planned Operational Date
GOES-R	Oct 2015	Dec 2016
GOES-S	Feb 2017	Apr 2020

See the Program Change for the proposed schedule/milestones, deliverables, and budget profile.

Polar-orbiting Operational Environmental Satellite Programs

The goals of the Polar-orbiting Operational Environmental Satellite programs are to continue the procurement of spacecraft, instruments, launch services, and ground systems equipment necessary to maintain an uninterrupted flow of environmental data to users.

Polar satellites provide a continuous flow of global environmental observations in support of operational requirements for:

- Environmental monitoring, and weather and marine forecasting;
- Climate assessment and change prediction;
- Detecting weather systems and significant environmental events such as volcanic eruptions, oil spills, and wildfires;
- Measuring atmospheric ozone and the space environment;
- Collecting environmental data from other surface platforms such as buoys; and
- Performing search and rescue functions.

POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE (POES) (http://www.oso.noaa.gov/poes/)

POES is NOAA's current operational polar satellite system, with the last satellite in the series (NOAA 19), launched on February 6, 2009. As part of an international agreement with the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the POES program also includes the European Polar Weather Satellite program, MetOp. These satellites carry U.S. instruments and provide data services coverage from a mid-morning polar-orbit through 2020.

NOAA has the responsibility to provide forecasts and warnings for the United States, its territories, adjacent waters and ocean area; for the protection of life and property and the enhancement of the national economy. This mission requires an enduring capability to acquire global data from satellites, and the capability to process and disseminate environmental data on an extensive spatial range (global, regional and local) within a variety of time scales (minutes to days) to central processing centers and distributed direct users. These data include, but are not limited to: global imagery; cloud and precipitation parameters; atmospheric profiles of temperature, moisture, wind, aerosols and ozone; surface conditions concerning ice, snow and vegetation; ocean parameters of sea temperature, color and state; and solar and in-situ space environment conditions.

These data are critical for:

- Severe storm and flood warnings;
- Tropical cyclone and hurricane reconnaissance and warnings; Hydrologic forecasts and forecasts of the ocean surface and internal structures;
- Medium range weather forecast (out to fifteen days);
- Solar and space environmental forecasts;
- Aviation forecasts (domestic, military, and international);
- Forecasts of ice conditions;
- Seasonal and inter-annual climate forecasts;
- Decadal-scale monitoring of climate variability;
- Assessment of long-term global environmental change;
- Environmental air quality monitoring and emergency response;
- Detection and analysis of fires and volcanic eruptions; and
- Short-term and mesoscale forecasts.

Continued funding supports:

- Satellite and instrument anomaly support to the on-orbit POES satellites;
- Maintaining the ground system for their operations; and
- The procurement, maintenance and testing of the U.S. instruments on the European MetOp satellites.

See the Program Change for the proposed schedule/milestones, deliverables, and budget profile.

SATELLITE ALTIMETRY MISSION – JASON-3

Jason-3 is a joint NOAA-EUMETSAT satellite altimetry mission which will provide continuity of precise measurement of sea [ocean] surface heights for applications in:

- Ocean Climatology: Global sea-level rise, Decadal variability in the ocean, Seasonal/inter-annual variability, and Coastal variability & its impact on ecosystems.
- Ocean Weather: Operational Oceanography, Surface wave forecasting & evaluation, and Hurricane intensity forecasting.

Jason-3 is a five-year development and integration effort that started in FY 2010. NOAA will provide a microwave radiometer, precision orbit determination components (e.g. GPS, Laser Retroreflector Array (LRA)), launch services, ground system and operations, and associated engineering services for Jason-3. Through an interagency agreement, NASA will be NOAA's acquisition and development agent in meeting our defined roles and responsibilities, but NOAA will retain overall program management responsibility. EUMETSAT will provide the spacecraft, altimeter, additional precision orbit components, ground system and operations.

Jason-3 will follow in the tradition of the previous altimetry missions, Topex/Poseidon, Jason 1 and 2. The Jason series has been transitioned as a research endeavor from NASA and the Centre National d'Etudes Spatiales (CNES), the French Space Agency, to NOAA and EUMETSAT for joint implementation as a sustained and systematic (i.e. operational) capability.

NASA on behalf of NESS has started acquisition of the mission instruments and started a feasibility study to identify a suitable launch vehicle.

Continued funding supports the ongoing acquisition of Jason-3 components and launch services to ensure a launch of Jason-3 in 2014.

See the Program Change for the proposed schedule/milestones, deliverables, and budget profile.

JOINT POLAR SATELLITE SYSTEM (JPSS) (FORMERLY NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM (NPOESS))

Presidential Decision Directive (PDD/NSTC-2, Convergence of US Polar-Orbiting Operational Environmental Satellite Systems, May 5, 1994) directed the Department of Commerce (DOC), Department of Defense (DOD), and National Aeronautics and Space Administration (NASA) to establish the NPOESS program. This decision integrated the Nation's civil (NOAA's POES) and military (DOD's DMSP) polar-orbiting meteorological satellite systems into a single, national system capable of satisfying both civil and national security requirements for space-based, remotely sensed environmental data. As a result, NOAA, DOD, and NASA formed a tri-agency Integrated Program Office (IPO) to develop, manage, acquire, and operate the new polar satellite system called NPOESS.

In February 2010 the Administration announced a major restructuring of the program, with DOD managing satellite acquisition for the morning orbit and NOAA—with the assistance of NASA—managing acquisition for the afternoon orbit. NOAA/NASA will continue to provide joint ground system support, and DOD will continue to provide early morning data sets to NOAA's numerical weather models.

JPSS will address NOAA's requirements to provide global environmental data such as cloud imagery, sea surface temperature, atmospheric profiles of temperature and moisture, atmospheric ozone concentrations, search and rescue, direct read-out, and data collection services. These data are used in numerical weather prediction models for near term (1-3 day) and mid-term (3-5 day) forecasts and used to provide data on monitoring climate change.

JPSS will continue the continuity of polar satellite coverage and will improve the nation's ability to collect and distribute higher resolution data and products. This is achieved through the modernization of sensors and systems to ensure improved performance, compatibility, supportability, and maintainability. This data will improve weather forecasts, climate monitoring, and warning lead times for severe storms benefiting agriculture, transportation, and energy production.

See the Program Change for the proposed schedule/milestones, deliverables, and budget profile.

CRITICAL SINGLE POINT OF FAILURE/CRITICAL INFRASTRUCTURE PROTECTION (CIP)

The Critical Infrastructure Protection project will provide backup systems at the Wallops Command and Data Acquisition Station (WCDAS) and will perform all mission critical operations and critical product data processing functions in the event of a catastrophic outage at the NSOF primary site.

The CIP is a backup facility to the NSOF/Environmental Satellite Processing Center operations to ensure the continuity of the nation's environmental satellite data images and critical products used by the NWS and DoD as inputs to analyses and forecast models. CIP will ensure continuity of the issuance of life-saving NWS watches and short-term warnings to the public in the event the primary ESPC system at the NSOF becomes inoperable.

The NOAA Product Processing and Distribution (PP&D) Office is a critical single point of failure for every operational NOAA satellite product and service that NWS and other users rely on for weather information. Satellite data represents more than 99 percent of the input to numerical weather prediction models. Satellite products and services include: POES products such as ozone, temperature and moisture measurements; GOES Advanced Weather Interactive Processing System (AWIPS) remapped imagery, high density winds, precipitation estimates; and non-NOAA satellite products from NASA, the DoD, Europe, Japan, and India.

Schedule and Milestones:

- FY11: Complete upgrade of communication links
  Set-up and testing of the Infrared Atmospheric Sounding Interferometer IASI and ASCAT
  Failover testing from NSOF to the OSDPD Backup Facility; and system documentation and operator training and become steady state
- FY12 –16: Build back-up systems for ESPC applications in order to address Research to Operations missions and continuing evolution of the OSDPD/ESPC systems and products.

Deliverables:

- The CIP project will provide backup systems and will perform mission critical operations and critical product data processing functions in the event of a catastrophic outage of the primary site satellite operations facility at NSOF.

Performance Goals and Measurement Data

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
% of primary satellite data processed and distributed in the event of a catastrophic outage at the NSOF primary site	90%	90%	90%	95%	95%	95%
Description: Provide satellite data processing backup in the event of a catastrophic outage of the primary satellite operations facility at NSOF. Primary satellite data is data that has been approved for CIP backup by the Satellite Products and Services Review Board (SPSRB).						

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
% of satellite data processed and distributed within 4 hours of CIP activation	90%	90%	90%	90%	90%	90%
Description: The CIP requirement is to have Priority 1 operational products available within 24 hours of CIP activation (complete product list in found at http://www.osdpd.noaa.gov/ml/cip.html).						

Outyear Funding Estimates (BA in thousands)

CIP	FY 2011 & Prior	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	CTC	Total
Change from FY 2012 Base		-	-	-	-	-		
Total Request	$24,891	$2,772	TBD	TBD	TBD	TBD	TBD	TBD

NPOESS PREPARATORY DATA EXPLOITATION (NDE): The NDE project will develop and implement capabilities to process and distribute NPP and Joint Polar Satellite System (JPSS) products and services, once the data have been delivered to NOAA. NOAA must implement capabilities to process the observations into useful products that meet the requirements of NOAA's operational centers and other civilian users. The NDE program will generate measurements of atmospheric and surface properties with smaller biases and less noise that will improve and extend the NWS's capability to provide weather forecasts and warnings. NESS and the NWS have collaborated to establish a priority for NDE product developments. As a result, the NDE program will provide the capability to generate the following data products for NOAA within two years after the NPP launch: atmospheric and ocean surface radiances, snow cover, sea surface temperature, vegetation fraction, tropical cyclone products, polar winds, atmospheric moisture, ocean color and ozone profiles.

The NDE project will develop the IT infrastructure and science code necessary to ingest and add value to NPP and JPSS observations. In FY 2011, NDE will procure and integrate the NPP

Production Environment, a data processing system designated to address the unique needs of the NOAA user community. Once validation and verification of the system and science products are complete, the Production Environment will be turned over to NESS Operations who will then assume 24x7 operations in FY 2012. The performance of this IT system will also be evaluated during the NPP post-launch period in FY 2012. Following the transition of the NPP Production Environment to operations, NDE will focus development on new NPP-based products and on the procurement and test of the JPSS Production Environment to prepare for the first JPSS mission. A similar period of IT systems evaluation will follow the JPSS 1 launch and will culminate in the transition of the Production Environment to NESS Operations.

Schedule & Milestones:

- FY11: Conduct pre-launch ground segment testing
  Conduct Launch Readiness Review for NPP
- FY12: Conduct post launch evaluation of the NDE Production Environment (PE) following the NPP launch.
  Initiate the transition of the NDE PE to NESS Operations.
- FY13: Complete transition NDE PE to NESS Operations.
  Deliver first set of products to NESS Operations.
- FY14: Deliver second set of products to NESS Operations.
- FY15: Test new JPSS Data Exploitation (JDE) Production Environment (PE) using NPP data.
- FY16: Conduct Launch Readiness Review for JPSS-1.

Deliverables/Outputs:

- Initiate delivery of the NDE PE to NESS Operations in FY 12. System will enable NESS Operations to generate 57 products to the NWS and other users in FY 2012-FY 2016.

Performance Goals and Measurement Data

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Number of new Science Products Tested within NDE Science Algorithm Development and Integration Environment (SADIE)	10	12	12	10	10	10
Description: NDE integrates new science algorithms, provided by NOAA scientists, into the NDE SADIE to conduct functional and end-to-end testing of the products generated from those algorithms. Once it is determined that the code is ready for operations, NDE will transition the algorithms to the PE for routine operations. The process of testing new algorithms and integrating them into operations takes approximately one year. All algorithms listed in FY 11-15 will generate new operational products from NPP one year later.						

Outyear Funding Estimates (BA in thousands)

NPOESS Data Exploitation	FY 2011 & Prior	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	CTC	Total
Change from FY 2012 Base		-	-	-	-	-		
Total Request	$22,651	$4,455	TBD	TBD	TBD	TBD	TBD	TBD

RESTORATION OF CLIMATE SENSORS

NOAA will continue the development of the remanifested climate sensors: the Total Solar Irradiance Sensor (TSIS), the Clouds and Earth's Radiant Energy System (CERES), and the Ozone Mapping and Profiler Suite-Limb (OMPS-Limb) sensor. TSIS, CERES/ERBS, and OMPS-Limb sensors were de-manifested from the National Polar-orbiting Operational Environmental Satellite System (NPOESS) as a result of the Nunn-McCurdy restructuring of the program in 2006. However, because of the Nation's critical need for climate measurements, these development efforts for these sensors have been re-started for delivery to the Joint Polar Satellite System (JPSS) Program.

These sensors will ensure NOAA continues to provide current, accurate, relevant and timely climate information to the scientific community and other interested parties through the monitoring of atmospheric conditions (including carbon dioxide, sulfur dioxide, nitrous oxide, water vapor, methane, ozone, soot, and aerosols), measurements of solar energy reaching the Earth's atmosphere (radiative forcing), and the Earth's reflected and radiated energy. These measurements are performed most accurately above the Earth's atmosphere via space-borne instruments. Without these sensors, alternative and less accurate methods would have to be employed to understand climate variability and change, severely impacting NOAA's ability to discriminate the anthropogenic effects from natural climate variability.

The 2007 National Research Council Decadal Survey Report: *Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond* identifies TSIS, ERBS, and OMPS-limb as critical climate continuity sensors. These sensors represent critical elements of the Earth Climate Observation System. Developing these sensors will ensure the continuity of the climate data records for solar irradiance, earth energy budget, and ozone. These instruments were also identified as the top priority by the joint NOAA-NASA climate assessment in January 2007. Therefore, the continuation of the data sets from these climate instruments is critical to climate change research and understanding the impacts of climate change. The prospects of such climate changes have profound implications for global society and the environment, underscoring the need for information derived from these instruments to aid decision makers in developing and evaluating options for mitigating the impacts of climate change as well as alternatives for adapting to a changing climate.

See the Program Change for the proposed schedule/milestones, deliverables, and budget profile.

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PROGRAM CHANGES FOR FY 2012:

Jason-3 (Base Funding: 0 FTE and $20,000,000; Program Change: +0 FTE and +$33,000,000):
NOAA requests an increase of $33,000,000 and 0 FTE for a total of $53,000,000 and 0 FTE to provide continuity of precise measurement of sea surface heights for applications in ocean climatology and ocean weather. Jason-type satellite altimetry is the only proven technique for monitoring global sea level rise, a key indicator of climate change. Jason-2 continues the systematic collection of sea level observations initiated by *TOPEX/Poseidon* in 1992. The Jason-3 satellite will be functionally equivalent to the Jason-2 satellite

Proposed Actions:
NOAA will provide a microwave radiometer, precision orbit determination components (e.g. GPS), launch services, and associated engineering services for Jason-3. Through an interagency agreement, NASA will be NOAA's acquisition and development agent in meeting our defined roles and responsibilities, but NOAA will retain overall program management responsibility. EUEMTSAT and CNES will provide the spacecraft, altimeter, precision orbit components, ground system, and operations.

Statement of Need and Economic Benefits:
While its latest projections for Global sea-level rise (GSLR) over the coming century range from 28 to 79 cm, the Intergovernmental Panel for Climate Change (IPCC) states "*…the upper values of the ranges given are not to be considered upper bounds…"* for GSLR because existing models are unable to account for uncertainties such as changes in ice sheet flow. Additionally, the U.S. Climate Change Science Program has recently stated that these uncertainties "…*will likely lead to sea-level projections for the end of the 21st century that substantially exceed the* [latest IPCC] *projection*." Because this will impact the 146 million people worldwide living within 1 meter of mean high water, it is critical that systematic observations of global sea level be collected on a continuing basis until these uncertainties are successfully addressed.

The Jason-3 Altimetry mission is needed to provide continuity of precise measurement of sea surface heights for applications in the areas of Ocean Climatology and Ocean Weather.

- Ocean Climatology Benefits:
    - Global sea-level rise - A fundamental indicator of climate change. Altimeter time series of several decades will be needed to distinguish signals related to anthropogenic warming from those related to natural variability, as well as to clarify whether the rate of sea-level rise is accelerating.
    - Decadal variability in the ocean - Has been shown to have an impact on fishery regime changes and correlates with droughts on land and changes in hurricane activity.
    - Seasonal/inter-annual variability - On seasonal to inter-annual timescales, ocean-atmosphere interactions in the tropical Pacific, the El Nino / Southern Oscillation (ENSO) phenomena, currently provide much of the signal for seasonal forecasts.
    - Coastal variability and its impact on ecosystems - Provide observations for modelling the ocean basin and the broader coastal area. Coastal forecasting is needed in responding to environmental problems such as oil spills and harmful algae blooms, as well as forecasting tides and currents important to commercial shipping.

- Ocean Weather Benefits
    - Operational Oceanography - Input to operational integrative services based on global and regional ocean models that provide real time and prognostic information on the state of the global ocean. This capability helps its users understand and monitor the

world's marine environment and facilitate a safe, non-polluting and sustainable human exploitation of the ocean environment.

- o Surface wave forecasting and evaluation - Accurate surface wave forecasts are a major requirement for offshore operators. Over the last decade altimeter-derived significant wave height data have been critical for improvements in wave prediction systems.
- o Hurricane intensity forecasting - The knowledge of the upper ocean heat content (OHC) is a critical factor in forecasting the intensity of hurricanes as they approach the U.S. east and Gulf coasts where high OHC is quite variable.

Base Resource Assessment:
Base resource assessment is provided in the Program Summary for the Jason-3 program.

Schedule and Milestones:

- FY12: Begin Phase D (Integration and Test)
  Deliver Advanced Microwave Radiometer (AMR), Global Positioning System (GPS) and Laser RetroReflector Array (LRA) to Europe
  Support spacecraft integration and test
- FY13: Complete Launch Vehicle development and deliver to launch site
  Support S/C to L/V integration and pre-launch preparations
- FY14: Launch Jason-3, begin routine operations
  Begin Phase E (Launch and Operations)
  Commission the S/C and instruments and start all required Calibration/Validation activities to measure Sea Surface Height to accuracy at 3-4 cm
- FY14 - 16: Complete Calibration/Validation activities and support production and distribution of operational and long-term science products.

Deliverables:

- NOAA will provide a microwave radiometer, precision orbit determination components (e.g. GPS), launch services, and associated engineering services for Jason-3.
- Continue 20 plus years of sea level observations, a critical climate monitoring variable, and provide operational ocean weather products using Jason 3 observations.

Performance Goals and Measurement Data

Performance Measure: Number of ocean science products produced	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
With Increase	0	0	0	5	5	5
Without Increase	0	0	0	0	0	0
Description: Jason-3 altimetry products will provide important data for ocean climatology studies and ocean weather forecasting as defined above under the Statement of Need and Economic Benefits. Products are Sea Level Height, El Nino Forecasting, Hurricane Intensity Forecasting, Ocean Waveheight Forecast, and Ocean Surface Current.						

Outyear Funding Estimates (BA in thousands)

Jason-3	FY 2011 & Prior	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	CTC	Total
Change from FY 2012 Base		$33,000						
Total Request	$40,000	$53,000	TBD	TBD	TBD	TBD	TBD	TBD

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Jason-3
Subactivity: Systems Acquisition

	Object Class	2012 Increase
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	33,000
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	33,000

Joint Polar Satellite System (JPSS) (Base Funding: 61 FTE and $382,200,000; Program Change: +0 FTE and +$687,800,000): NOAA requests an increase of $687,800,000 and 0 FTE for a total of $1,070,000 and 61 FTE to continue development of the Joint Polar Satellite System (JPSS) instruments, the ground systems, and the spacecraft for the afternoon orbit for the JPSS program.

The JPSS program continues a number of management and acquisition reforms initiated in FY 2010 to deliver polar observations necessary to meet both the civil and military needs for weather and climate information. To implement the restructured JPSS program as directed by Executive Office of the President in February 2010, NOAA will oversee program management while NASA will provide technical management as the acquisition agent. NOAA and NASA will share the mission success responsibility. Mission success includes building all instruments, launching the spacecraft, algorithm development, ground systems development, and all other program-related activities that are essential to the success of the JPSS program.

Proposed Actions:
The total appropriated FY 2012 funds will be provided directly to NOAA, who will provide the funding to NASA to continue instrument, ground systems, satellite procurements, and other program-related activities to meet the program milestones and launch dates which will be determined by NOAA. Specifically, funds will:

- Continue to develop the suite of instruments originally planned for the NPOESS mission (VIIRS, CrIS, ATMS, and OMPS)
- Acquire a satellite bus for the afternoon orbit
- Continue to develop a common ground system for the civil and military polar observations

Statement of Need and Economic Benefits:
A successful JPSS will continue to improve the nation's ability to collect and distribute higher resolution data and products. This is achieved through the modernization of sensors and systems to ensure improved performance, compatibility, supportability, and maintainability. The JPSS will improve forecasts, climate monitoring, and warning lead times for severe storms, benefiting sectors such as agriculture, transportation, and energy production.

Data and imagery obtained from JPSS satellites will help increase timeliness, accuracy, and cost-effectiveness of public warnings and forecasts of climate and weather events. This program serves the National Weather Service by providing continuous global temperature and humidity values from polar satellites that provide critical inputs for quality three to five day and long-range temperature, precipitation, and snow forecasts. Polar satellites also monitor the global sea surface temperature, indicating the location, onset, and severity of El Nino and La Nina events as early as possible. Longer lead times of these impending events allow emergency and agricultural managers to activate plans to reduce the impacts of floods, landslides, fires, oil spills, volcanic eruptions, and droughts, thus reducing the potential loss of human life and property.

Base Resource Assessment:
Base resource assessment is provided in the Program Summary for the JPSS program.

Schedule & Milestones:

- FY12: Continue instrument and satellite bus procurements, ground system development, and begin procurement of JPSS-1 launch vehicle
  Launch NPP
- FY15: Deliver first set of instruments for the afternoon orbit

Complete development of the JPSS satellite bus

- FY16: First satellite launch readiness
- FY19: Second satellite launch readiness

These dates may be adjusted as the transition plan is developed.

Deliverables:

- Deliver NPP launch readiness in FY11
- Deliver VIIRS, CrIS, OMPS, and ATMS instruments in FY15 to support a FY16 launch readiness of the first JPSS afternoon orbit satellite

Performance Goals and Measurement Data

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Percent of forecast warnings and nowcasts supported under 28 minutes data latency						
With Increase	0%	95%	95%	95%	95%	95%
Without Increase	0%	95%	95%	95%	95%	95%
Description: This measure reflects the JPSS program, existing satellites and NPP. JPSS-1 will continue to meet these targets after launch. JPSS-1 launch readiness is FY 2016; therefore a decrease in performance is expected after FY2016 without the increase.						

Performance Measure:	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
Percent of data availability to support NOAA operational needs						
With Increase	0%	99.95%	99.95%	99.95%	99.95%	99.95%
Without Increase	0%	99.95%	99.95%	99.95%	99.95%	99.95%
Description: This measure reflects the JPSS program, existing satellites and NPP data availability to support civilian and military operational needs. JPSS-1 will continue to meet targets after launch. JPSS-1 launch readiness is FY 2016; therefore a decrease in performance is expected after FY2016 without the increase.						

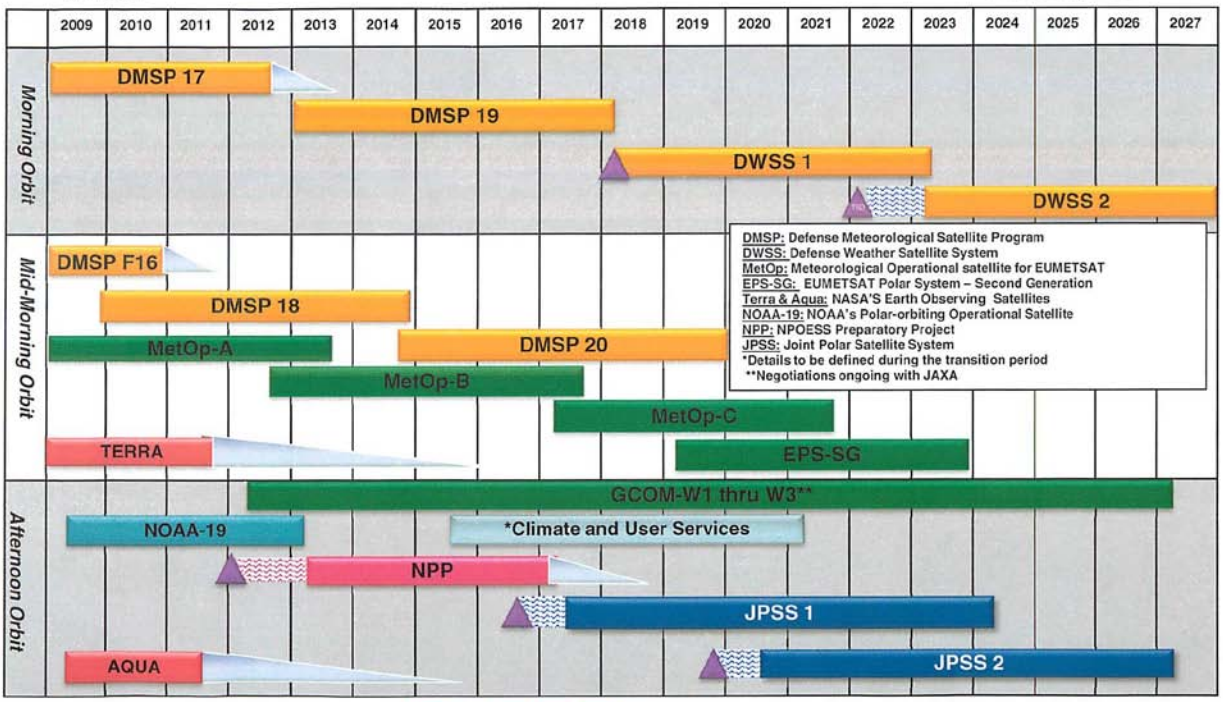
Outyear Funding Estimates (BA in thousands)

JPSS	FY 2011 & Prior	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	CTC	Total
Change from FY 2012 Base		$687,800						
Total Request	$3,290,694	$1,070,000	TBD	TBD	TBD	TBD	TBD	TBD

Continuity of Polar Operational Satellite Programs

Fiscal Year

As of January 14, 2011



Approved: M. E. Kicza

Assistant Administrator for
Satellite and Information Services

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: JPSS
Subactivity: Systems Acquisition

	Object Class	2012 Increase
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	687,800
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	687,800

Deep Space Climate Observatory (DSCOVR) (Base Funding: 0 FTE and $0; Program Change: +0 FTE and +$47,300,000): NOAA requests an increase of $47,300,000 and 0 FTE for a total of $47,300,000 and 0 FTE in FY 2012 to maintain continuity of solar wind data used for geomagnetic storm warnings by refurbishing the DSCOVR satellite and developing a Coronal Mass Ejection (CME) imager.

Proposed Actions:
FY 2012 funds will support the refurbishment of an existing NASA Satellite, DSCOVR, by the NASA/Goddard Space Flight Center (GSFC). The DSCOVR satellite is currently housed at GSFC in Greenbelt, Maryland. Funds will also support the Naval Research Laboratory in the continued development and build of a CME imager instrument necessary for geomagnetic storm warnings.

In 2008, NASA tested the condition of the DSCOVR spacecraft and sensors to determine the feasibility of refurbishing the DSCOVR mission for flight. The FY 2012 budget request is consistent with the results of NASA's test, which are documented in the NASA *Serotine Report.* The White House Office of Science and Technology Policy supported the initiative to refurbish DSCOVR consistent with the Serotine Report recommendations, and a recommendation made by the interagency Committee on Space Environmental Sensor Mitigation Options (CSESMO). This program is being done in partnership with the U.S. Air Force (USAF), which will provide launch vehicle and services.

Statement of Need and Economic Benefits:
Without timely and accurate alerts and warnings, space weather has the potential to disrupt virtually every major public infrastructure system, including transportation systems, power grids, telecommunications, and GPS. NOAA currently provides geomagnetic storm warnings to support key industries such as the commercial airline, electric power, and GPS industries. Much of our nation's infrastructure is based on advanced technologies that would be at significant risk without accurate 1-4 day advanced warnings of impending geomagnetic storms. According to a recent report by the National Academies (*Severe Space Weather Events – Understanding Societal and Economic Impacts,* National Research Council 2009), geomagnetic storm-disabled electric power grids and collateral impacts could result in projected economic and societal costs of approximately $1 -$2 trillion, and full recovery could take 4 –10 years. Additionally, geomagnetic storm warnings are important for aircraft flying polar routes since such storms could impact critical communication and navigation systems, as well as subject flyers to hazardous solar radiation exposure.

The frequency and intensity of geomagnetic storms will increase significantly as the next solar maximum approaches in 2013. Strong storms with the potential to impact critical elements of our Nation's infrastructure can occur over 100 times during a solar cycle. The Nation's advanced technology service providers will be looking to NOAA for alerts, watches and warnings needed to protect lives and livelihood and ensure continuity of critical operations.

Currently, the only data source for geomagnetic storm warnings (providing 15-45 minute lead times for impending space weather storms) is NASA's Advanced Composition Explorer (ACE) satellite, which is operating 12 years past its design life. The geomagnetic storm forecasts, which provide 1-4 day warnings of impending space weather storms, use coronal mass ejection imagery received now from NASA/ESA's SOHO and NASA's STEREO satellites. Launched in 1995, 1997, and 2006, all of these satellites have exceeded their two-year design life. Without immediate action, NOAA wll lose two of its most critical space weather observation data sources when the NASA ACE and the NASA/ESA SOHO satellites fail. Low reliability of the satellites and sensors and the high risk of unavailability of the data pose one of the most serious gaps for NOAA's space weather services. By refurbishing the DSCOVR satellite, NOAA will be able to continue to

provide geomagnetic storm warnings and forecasts at less cost than designing and building a new satellite.

In 2005, NOAA issued a press release informing its geomagnetic storm warning customers that the alert might be discontinued at any time due to the current data source of solar wind, the ACE satellite, being years beyond its design life. Customers were invited to respond to NOAA documenting the impact of the loss of the warning on them. Their responses were summarized in a report "Evaluation of Public Response to the Termination of Solar Wind Data", October 2006. Members of the electrical power industry, which is vulnerable to geomagnetic storm-induced blackouts and transformer damage, have repeatedly corresponded with the Department of Commerce, the White House, and the Congress regarding their concerns for the risk posed by the potential loss in geomagnetic storm forecasting data.

Base Resource Assessment:
There are no base resources because DSCOVR is a new start.

Schedule and Milestones:

- FY12: Initiate refurbishment of DSCOVR satellite
  Initiate Solar Wind Sensor Recalibration
  Begin CME development at Naval Research Laboratory
  United States Air Force Begins Launch Vehicle Acquisition
  Reintegrate Solar Wind Sensors on DSCOVR
- FY13: Perform Spacecraft and Sensor Environmental Testing
- FY14: Launch Spacecraft
- FY14-18: Maintenance and Operations

The DSCOVR mission expected end of life is 2018.

Deliverables:

- FY13: CME imager delivered, DSCOVR refurbished
- FY14: Launch vehicle, operational solar wind and data and CME imagery received

Performance Goals and Measurement Data

Performance Measure: Lead Time Storm Warnings (minutes)	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
With Increase	40	40	40	40	40	40
Without Increase	40	40	40	0	0	0

Description: This measure is a Space Weather Prediction Center (SWPC) performance measure that represents the average number of minutes of warning before geomagnetic storm arrival. Once SWPC receives real-time data regarding geomagnetic storm arrival, the alert is posted on their website and email alerts are sent to customers that subscribe. SWPC will also phone high impact customers such as FEMA, Coast Guard, power distributors, airlines, etc. Measure also assumes ACE continues until the launch of DSCOVR.

Performance Measure: % Warnings Issued Prior to Storm	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
With Increase	100%	100%	100%	100%	100%	100%
Without Increase	100%	100%	100%	0	0	0

Description: This measure is a SWPC performance measure that ensures issuance of warnings for all geomagnetic storms. Once SWPC receives real-time data regarding geomagnetic storm arrival, the alert is posted on their website and email alerts are sent to customers. SWPC will also phone high impact customers such as FEMA, Coast Guard, power distributors, airlines, etc. Measure also assumes ACE continues until the launch of DSCOVR.

Performance Measure: % Alerts Delivered within 10 minutes of onset	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
With Increase	98%	98%	98%	98%	98%	98%
Without Increase	98%	98%	98%	0	0	0

Description: This measure is a SWPC performance measure that shows what percentage of alerts get out at least 10 minutes prior to the storm. Once SWPC receives real-time data regarding geomagnetic storm arrival, the alert is posted on their website and email alerts are sent to customers. SWPC will also phone high impact customers such as FEMA, Coast Guard, power distributors, airlines, etc. Measure also assumes ACE continues until the launch of DSCOVR.

Outyear Funding Estimates (BA in thousands)

DSCOVR	FY 2011 & Prior	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	CTC	Total
Change from FY 2012 Base		$47,300						
Total Request	$0	$47,300	TBD	TBD	TBD	TBD	TBD	TBD

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: DSCOVR
Subactivity: Systems Acquisition

	Object Class	2012 Increase
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	47,300
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	47,300

Constellation Observing System for Meteorology Ionosphere and Climate-2 (COSMIC-2) (Base Funding: 0 FTE and $0; Program Change: +0 FTE and +$11,300,000): NOAA requests an increase of $11,300,000 and 0 FTE for a total of $11,300,000 and 0 FTE to collaborate with the Taiwan National Space Organization (NSPO) for the launch of 12 satellites which will provide replenishment and operational upgrade to the current COSMIC constellation.

Proposed Actions:
NOAA will procure 12 radio occultation (RO) sensors, provide ground station support, add tracking station capabilities in order to lower latency, and sensor processing support. Taiwan will provide the spacecraft and integrate the sensors onto them. During FY 2012, NOAA would enter into contracts with Jet Propulsion Lab (JPL) and the COSMIC-2 instrument development vendor for the first 6 RO sensors. NOAA will also begin development of the engineering design for the ground network.

Statement of Need and Economic Benefits:
The COSMIC program is a cost effective means of obtaining global atmospheric temperature profiles. This data is currently used to determine high accuracy atmospheric temperatures at various altitudes that improve weather forecasts, and have demonstrated an 8+ hours forecast improvement starting at day four in the forecast model. This data is not available globally from other sources and losing this data will result in a significant degradation of performance of NOAA's numerical weather models. COSMIC helps to eliminate bias for artificial offsets in other observing systems by helping to create consistent measurements from different systems. This advances the overall impact on operational weather models and makes COSMIC a backbone for the total observing system.

The National Center for Environmental Prediction (NCEP) has documented measureable forecast improvements using GPS Radio Occultation (GPSRO) data (Cucurull, Derber, 2008). GPSRO data provides unique advantages that can be leveraged to improve data collected from existing NOAA sensors. GPSRO also significantly increases the volume of quality observed global atmospheric soundings, providing temperature, water vapor, and pressure profiles. In some cases (e.g., ionospheric electron density profiles), COSMIC data fills a void of observations where they do not exist now and can lead to improved NOAA space weather services.

Approximately 1,000 radiosondes are launched in the world each day, typically over land. COSMIC provides more global coverage with an additional 2,000 soundings per day that have an even distribution and accuracy rate over the ocean and land. COSMIC-2 will provide over 8,000 soundings per day, significantly increasing the volume of quality observed global atmospheric soundings which result in more accurate long range forecasts. In addition, COSMIC-2 will provide vertical temperature and moisture sounding information over the tropics that will be an essential data system for tropical storm prediction as storms develop over the open oceans.

The National Weather Service mid- and long-range forecasts for large storms and extreme rain and snowfall events have become highly accurate with COSMIC's contributions. These forecasts provide tangible and substantial benefits to national commerce and transportation. For example, during the winter storms in February 2010, excellent forecast skill allowed for federal, state, and local contingency planning; enabled airlines to cancel flights and decision makers to close airports; and alerted ground transportation and retail industries to accelerate deliveries and stock up on critical supplies before the storms hit. COSMIC has been one of the largest game changers over the past five years, enabling early detection of extreme weather events that have significant socioeconomic impacts.

Base Resource Assessment:
There are no base resources because COSMIC is a new start.

Schedule and Milestones:

- FY12-14: Complete 6 RO Sensors, complete ground system enhancements
- FY15: First Launch
- FY15-16: Complete second set of 6 RO Sensors
- FY17: Second Launch

Deliverables:

- Develop, launch, and operate a 12-satellite constellation producing atmospheric profile products from the troposphere through the ionosphere in coordination with the Taiwan National Space Organization.

Performance Goals and Measurement Data

Performance Measure: Day 4 Forecast Improvement (hours)	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
With Increase	**0**	**0**	**0**	**0**	**0**	**0**
Without Increase	**0**	**0**	**0**	**0**	**-8**	**-8**
Description: Provide real-time atmospheric and temperature data from the COSMIC constellation to maintain 8 hour improvement in the Day 4 weather forecast. The targets for FY11 -14 are dependent on the original COSMIC constellation, which is designed to last until the end in 2011 but we expect will continue to provide data through 2014.						

Performance Measure: Day 7 Forecast Improvement (hours)	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
With Increase	**0**	**0**	**0**	**0**	**0**	**0**
Without Increase	**0**	**0**	**0**	**0**	**-15**	**-15**
Description: Provide real-time atmospheric and temperature data from the COSMIC constellation for Day 7 weather forecast improvement. The targets for FY011 -14 are dependent on the original COSMIC constellation, which is designed to last until the end in 2011 but we expect will continue to provide data through 2014.						

Outyear Funding Estimates (BA in thousands)

COSMIC-2	**FY 2011 & Prior**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**CTC**	**Total**
Change from FY 2012 Base		$11,300						
Total Request	$0	$11,300	TBD	TBD	TBD	TBD	TBD	TBD

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: COSMIC-2
Subactivity: Systems Acquisition

	Object Class	2012 Increase
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	11,300
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	11,300

Restoration of Climate Sensors (Base Funding: 0 FTE and $0; Program Change: +0 FTE and $30,400,000): NOAA requests an increase of $30,400,000 and 0 FTE for a total of $30,400,000 and 0 FTE in FY 2012 to support the continued development of Clouds and the Earth's Radiant Energy System Flight Model 6 (CERES FM-6) and the Total Solar and Spectral Irradiance Sensor (TSIS).

Proposed Actions:
This request continues the development of the climate sensors to be incorporated into the JPSS program. Specifically, funds support the continued development of CERES FM-6 and TSIS instruments. The sensors under development are based on the NASA Earth Observing System (EOS) heritage designs to maintain the data continuity started by EOS that is required to accurately assess long-term changes in the Earth's climate. NASA will be NOAA's acquisition agent in procuring the Climate Sensors and will hold the contracts with vendors, under an Interagency Agreement. However, NOAA will retain overall program management responsibility.

Statement of Need and Economic Benefits:
These sensors will maintain and improve the Nation's ability to collect and distribute higher resolution climate data and products. This is achieved through the modernization of sensors and systems to ensure better performance, compatibility, supportability, and maintainability. These sensors will ensure NOAA continues to provide current, accurate, relevant and timely climate information to the scientific community and other interested parties through the monitoring of atmospheric conditions (including carbon dioxide, sulfur dioxide, nitrous oxide, water vapor, methane, ozone, soot, and aerosols), and measurements of radiative forcing (solar energy reaching the Earth's atmosphere) and the Earth's reflected and radiated energy. Climate forecasts and monitoring will be improved, thus benefiting agriculture, transportation, and energy production.

The continuation of the data sets from these climate instruments is critical to climate change research and understanding the impacts of climate change. The prospects of such climate changes have profound implications for the global society and environment, underscoring the need for information derived from these instruments to aid decision makers in developing and evaluating options for mitigating the impacts of climate change as well as alternatives for adapting to a changing climate.

The 2007 National Research Council Decadal Survey Report: *Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond* identifies TSIS, ERBS, and OMPS-limb as critical climate continuity sensors. These sensors represent critical elements of the Earth Climate Observation System. Developing these sensors will ensure the continuity of the climate data records for solar irradiance, earth energy budget, and ozone. These instruments were also identified as the top priority by the joint NOAA-NASA climate assessment in January 2007.

Base Resource Assessment:
Base resource assessment is provided in the Program Summary for the Climate Sensor program.

Schedule and Milestones:
- FY12: Continue instrument development for CERES FM6 and TSIS #1.
- FY13: Continue CERES FM6 and TSIS #1 instrument development. Initiate OMPS-L and TSIS #2 development.
- FY14: Deliver and integrate CERES FM-6 and TSIS #1 into JPSS program, continue OMPS-L and TSIS #2 instrument developments.

- FY15 Continue TSIS #2 and OMPS-L
- FY16: Deliver and integrate OMPS-L and TSIS #2 on JPSS 2.

Deliverables:

- FY14: Deliver CERES FM-6 and TSIS #1 to JPSS
- FY16: Deliver OMPS-L and TSIS #2 to JPSS 2

Performance Goals and Measurement Data

Performance Measure: Long-term CDR's in support of the USGCRP national assessment **supported by CERES.**	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
With Increase	2	2	2	2	2	2
Without Increase	2	2	2	2	2	2
Description: CERES instruments will provide measurements of incoming and outgoing radiation at the top of the earth's atmosphere. CERES FM-6 will continue two critical long-term CDR's in support of the USGCRP national assessment. Without the increase, the impact is seen in FY18.						

Performance Measure: Long-term CDR's in support of the USGCRP national assessment **supported by TSIS.**	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
With Increase	2	2	2	2	2	2
Without Increase	2	2	2	2	2	2
Description: TSIS instruments will provide measurements of incoming and outgoing radiation at the top of the earth's atmosphere. Without the increase, the impact is seen in FY18.						

Outyear Funding Estimates (BA in thousands)

Restoration of Climate Sensors	**FY 2011 & Prior**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**CTC**	**Total**
Change from FY 2012 Base		$30,400						
Total Request	$136,985	$30,400	TBD	TBD	TBD	TBD	TBD	TBD

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Restoration of Climate Sensors
Subactivity: Systems Acquisition

	Object Class	2012 Increase
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	30,400
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	30,400

GOES-N (Base Funding: 0 FTE and $53,945,000; Program Change: -0 FTE and -$19,978,000):
NOAA requests a decrease of 0 FTE and $19,978,000 for a total of 20 FTE and $33,967,000 for the GOES-N Series program.

Proposed Actions:
In addition to the planned decrease of $8,861,000, in FY 2012, the program will:

- Permanently transfer $2,846,000 that supported archive technical refresh to the Climate Service consistent with the transfer of the Data Centers to the Climate Service.
- Permanently transfer $810,000 for the Radio Frequency Management Division to the Office of the Chief Information Officer.
- Realize saving of $11,117,000 as a result of reduced NASA requirements to administer the program and savings in the ground system.

The funding decrease re-aligns the GOES-N Series total program to support handover of GOES-15 from NASA to NOAA, and provides technical management, maintenance and operations of the on-orbit assets.

Statement of Need and Economic Benefits:
Since 1975 when GOES-1 (A) was launched, the benefits derived from the GOES Program were immediate. Specifically, geostationary satellite information has become a standard tool used to generate advisories to inform the public of severe weather conditions. NWS and news stations depend on the data generated by the geostationary satellites. The images of hurricanes shown on news stations in the United States and around the world are due to these critical satellites.

The GOES-N Series program aids the public by generating timely and accurate environmental data/weather information. A primary function of the GOES Program is supporting the NWS in forecasting, tracking, and monitoring severe storms. The improved accuracy of the NWS forecasts by using GOES data for severe storms results in weather forecasting/advisories to impacted areas to ensure authorities and the public are equipped with decision-making information to protect lives and property.

The GOES Program continuity schedule was created to ensure that disruption of satellite observations do not occur that will significantly impact customers/users use of the environmental data in decision-making and development of scientific analyses that could negatively impact NOAA's ability to accomplish its mission.

Maintaining GOES continuity is necessary to provide continuous global weather monitoring from two geostationary orbital locations to provide near total Western Hemispheric coverage.

Base Resource Assessment:
Base resource assessment is provided in the Program Summary for the GOES program.

Schedule and Milestones:
The current GOES-15 has a planned operational date of 2015.

Deliverables:
The current GOES-15 has a planned operational date of 2015.

Performance Goals and Measurement Data

Performance Measure: Percentage of NOAA-managed satellite data processed and distributed within 15 minutes	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
With Decrease	98%	98%	98%	98%	98%	98%
Without Decrease	N/A	N/A	N/A	N/A	N/A	N/A
Description: This measure includes observations from the primary geostationary spacecraft tracked from observation through availability to the user. This measure is used to track timeliness and customer satisfaction. The targeted time for GOES is 15 minutes.						

Outyear Funding Estimates (BA in thousands)

GOES-N	**FY 2011 & Prior**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**CTC**	**Total**
Change from FY 2012 Base		($19,978)						
Total Request	$2,073,368	$33,967	TBD	TBD	TBD	TBD	TBD	TBD

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Geostationary Orbiting Systems – GOES-N
Subactivity: Systems Acquisition

	Object Class	2012 Decrease
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	-19,978
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	-19,978

GOES-R (Base Funding: 46 FTE and $667,500,000; Program Change: -0 FTE and -$50,110,000):
NOAA requests a decrease of 0 FTE and $50,110,000 for a total of 46 FTE and $617,390,000 to provide continued satellite engineering development and production activities for GOES-R and GOES-S, and to introduce development activities for the option satellites: GOES-T and U. This budget request for FY 2012 is for a four-satellite GOES-R (GOES-R, S, T, & U) program with enhanced capabilities above the current GOES-N, O, and P Series.

The GOES-R Series will provide continuity of GOES data coverage after the GOES-N series. GOES-R is the next-generation series of NOAA geostationary satellites and provides GOES mission continuity through 2036. The procurement of GOES satellites is a cooperative venture between NOAA and NASA. NOAA defines requirements, manages, funds, implements system integration, procures ground segments and operates the GOES satellites. NASA serves as the agency with multi-disciplinary engineering expertise, develops detailed system specifications, procures and launches the spacecraft, and assists NOAA in system integration.

Proposed Actions:
NOAA proposes to adjust the phasing of resources to better reflect where program risks are likely to occur going forward, resulting in a decreased funding requirement in FY 2012. Additionally, in FY 2010 and FY 2011, the GOES-N program will contribute $28 million for antenna needs under the GOES-R antenna contract. This will offset $28 million in planned GOES-R costs.

The GOES-R procurements include options for acquiring additional satellites (T and U) and instruments to realize potential savings from economies of scale. The life cycle costs for GOES-T&U of $3,218.5 million includes all associated instruments and operations cost through 2036, increasing the current GOES-R life cycle cost estimate for a 2 satellite program of $7,644.0 million ending in 2028 to $10,862.5 million for a 4 satellite program ending in 2036 and assumes the probability of having two geostationary satellite imagers on orbit through that period above 80%. The archive and access function will be provided by NOAA's CLASS system. This end-to-end integration requires the acquisition, deployment, maintenance, and operations of the space, ground and launch segments.

FY 2012 GOES-R funding will be used for:

- Acquisition & Operations including continued development of GOES-R & S spacecraft and ground system. The program will complete the Critical Design Review (CDR) for the GOES-R Series spacecraft and ground system.
- Instruments already under contract: Advanced Baseline Imager (ABI), Solar Ultra Violet Imager (SUVI), Extreme Ultra Violet Sensor/X-Ray Sensor Irradiance Sensor (EXIS), Space Environmental In-Situ Suite (SEISS), and Geostationary Lightning Mapper (GLM); continued funding of Flight Models and spares for each instrument in FY 2012 and product algorithm development from the ABI Instrument for GOES-R and GOES-S satellites; and continuation of the ground system antenna contract.
- Procure and assemble GOES-T & U instruments.

GOES-R requires the funding to proceed with the procurement of GOES-T&U instruments in FY 2012 to support the launch readiness of GOES- T&U. This supports the continuity of production from GOES-R&S to T&U. Interrupting the production continuity between GOES-R&S and T&U will result in production inefficiencies, supplier discontinuities, parts obsolescence, and skilled workforce retention and/or rehiring issues.

Statement of Need and Economic Benefits:
The GOES system provides an uninterrupted, continuous flow of environmental data and information that is critical to the Nation's weather forecasting capabilities. The needs and benefits of GOES-R series satellites are as follows:

- Maintains continuous real-time observations for severe storms, hurricanes, and weather monitoring to the Nation;
- Provides advances in NOAA's observation capabilities for all NOAA mission goals, including improvements to coastal, space weather, and lightning observations;
- Needed as a backup to GOES 14 or 15, part of a system of two operational satellites and an on-orbit spare; and
- Incorporates key enhancements in spatial and spectral information, coverage, and timeliness to help generate more timely and accurate weather forecasts.

The GOES-R - U satellites are being developed as the follow-on to the GOES-N series. The GOES-R - U series will minimize losses to life, land and the economy by giving early warning for severe weather events, which can cause significant impacts to people and property such as:

- $11.4 billion in average annual damage from tornadoes, hurricanes, and floods with about 100 deaths annually[1].
- Approximately $4 billion per year is lost in economic efficiencies as a result of weather-related air traffic delays[2].
- $4 and $5 billion in losses each year due to lightning in the civilian sector with about 47 deaths and 303 injuries per year[3]

Base Resource Assessment:
Base resource assessment is provided in the Program Summary for the GOES-R program.

Schedule and Milestones:

Spacecraft	Launch Readiness Date	Planned Operational Date
GOES-R	Oct 2015	Dec 2016
GOES-S	Feb 2017	Apr 2020
GOES-T	Apr 2019	Mar 2025
GOES-U	Oct 2024	Jul 2028

Deliverables:

- CDR for System Level, Spacecraft and Ground System
- Delivery of first Flight Model (FM) for ABI, SEISS, GLM, and EXIS
- Continue development of software and acquisition of hardware for Ground System

[1] (Extreme Weather Sourcebook 2001: *Economic & Other Societal Impacts Related to Hurricanes, Floods, Tornadoes, Lightning, and Other U.S. Weather Phenomena***.** Collaborative Program on the Societal Impacts and Economic Benefits of Weather Information, Boulder, CO)
[2] (NOAA, 2002: GOES-R Sounder and Imager Cost/Benefit Analysis, NOAA NESS Office of Systems Development, Silver Spring, MD)
[3] (NOAA, 2004: GOES-R Sounder and Imager Cost/Benefit Analysis - Phase III. NOAA/NESS/Office of Systems Development, Silver Spring, MD).

- Continue development of Spacecraft and Antennas for Ground System

Performance Goals and Measurement Data

Performance Measure: Improvement in the accuracy of hurricane intensity forecasts in the 24- to 48-hour time frame.	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
With Decrease	N/A	N/A	N/A	N/A	N/A	10%
Without Decrease	N/A	N/A	N/A	N/A	N/A	10%
Description: Improvement in the accuracy of hurricane intensity forecasts, in the 24-48 hour time frame, as a result of the continuous monitoring of total lightning flash rate from the GLM together with improvements in observations from the ABI.						

Performance Measure: Improvement in hurricane track forecasts out to 5 day	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
With Decrease	0	0	0	0	0	5%
Without Decrease	0	0	0	0	0	5%
Description: Improvement in the accuracy of hurricane track forecasts, out to day 5, as a result of the continuous monitoring of total lightning flash rate from the GLM together with improvements in observations from the ABI.						

Performance Measure: Improvement in tornado warning lead times (in minutes)	FY 2011 Target	FY 2012 Target	FY 2013 Target	FY 2014 Target	FY 2015 Target	FY 2016 Target
With Decrease	0	0	0	0	0	7
Without Decrease	0	0	0	0	0	7
Description: Improvement in the tornado warning lead time as a result of the continuous monitoring of total lightning flash rate from the GLM. .						

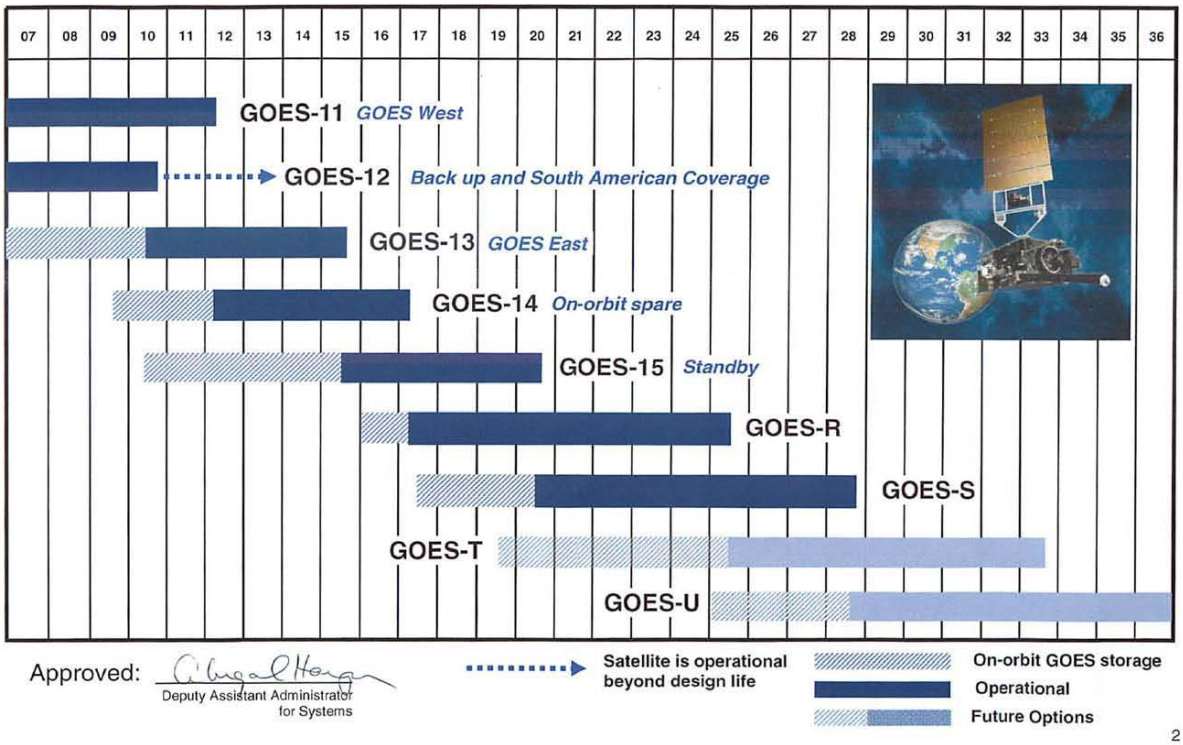
Outyear Funding Estimates (BA in thousands)

GOES-R	FY 2011 & Prior	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	CTC	Total
Change from FY 2012 Base		($50,110)						
Total Request	$2,798,044	$617,390	TBD	TBD	TBD	TBD	TBD	TBD

Continuity of GOES Operational Satellite Programs

Fiscal Year

As of January 10, 2011



Approved: Abigail Hoag
Deputy Assistant Administrator for Systems

Satellite is operational beyond design life

On-orbit GOES storage
Operational
Future Options

2

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Geostationary Orbiting Systems – GOES-R
Subactivity: Systems Acquisition

	Object Class	2012 Decrease
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	-50,110
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	-50,110

Polar Operational Environmental Satellite Systems (POES) NOAA Polar K-N' (Base Funding: 22 FTE and $43,135,000; Program Change: -0 FTE and -$8,319,000): NOAA requests a decrease of $8,319,000 and 0 FTE for a total of $34,816,000 and 22 FTE for the continuation of the POES program, and continued support for the MetOp program. The revised funding requirement represents recently identified savings as a result of the successful launch of the last POES satellite, NOAA-19, in February 2009.

Proposed Actions:
Continued funding in FY 2012 will provide satellite and instrument anomaly support to the on-orbit POES satellites, maintain ground system for their operations, and support the procurement, maintenance and testing of the U.S. instruments on the European MetOp satellites.

Statement of Need and Economic Benefits:
NOAA has the responsibility to provide forecasts and warnings for the United States, its territories, adjacent waters and ocean area, for the protection of life and property and the enhancement of the national economy. This mission requires an enduring capability to acquire global data from satellites, and the capability to process and disseminate to central processing centers and distributed direct users, environmental data on an extensive spatial range (global, regional and local) within a variety of time scales (minutes to days). These data include, but are not limited to: global imagery; cloud and precipitation parameters; atmospheric profiles of temperature, moisture, wind, aerosols and ozone; surface conditions concerning ice, snow and vegetation; ocean parameters of sea temperature, color and state; solar and in-situ space environment conditions.

These data are critically needed for:
- Severe storm and flood warnings;
- Tropical cyclone and hurricane reconnaissance and warnings;
- Hydrologic forecasts and forecasts of the ocean surface and internal structures;
- Medium range weather forecast (out to fifteen days);
- Solar and space environmental forecasts;
- Aviation forecasts (domestic, military, and international);
- Forecasts of ice conditions;
- Seasonal and inter-annual climate forecasts;
- Decadal-scale monitoring of climate variability;
- Assessment of long-term global environmental change;
- Environmental air quality monitoring and emergency response;
- Detection and analysis of fires and volcanic eruptions; and
- Short-term and mesoscale forecasts.

Base Resource Assessment:
Base resource assessment is provided in the Program Summary for the POES program.

Schedule and Milestones:
- FY12: Continue on-orbit support for NOAA-19 and provide support for MetOp-B Launch
- FY13 - 15: Support annual reactivation for MetOp-C
- FY16: Prepare to support the launch of MetOp-C

Deliverables:

- Engineering support for the on orbit POES satellites and support to EUMETSAT for U.S. instruments for MetOp satellites, either in orbit or waiting to be launched.

Performance Goals and Measurement Data

Performance Measure: Provide polar satellite observations to users from at least one orbit within 3 hours of observation.	**FY 2011 Target**	**FY 2012 Target**	**FY 2013 Target**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**
With Decrease	95%	95%	95%	95%	95%	95%
Without Decrease	95%	95%	95%	95%	95%	95%
Description: Provide the necessary polar observations for global environmental monitoring.						

Outyear Funding Estimates (BA in thousands)

POES	**FY 2011 & Prior**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**CTC**	**Total**
Change from FY 2012 Base		($8,319)						
Total Request	$2,411,664	$34,816	TBD	TBD	TBD	TBD	TBD	TBD

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Polar Orbiting Systems
Subactivity: Systems Acquisition

	Object Class	2012 Decrease
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	-8,319
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	-8,319

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APPROPRIATION: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUBACTIVITY: CONSTRUCTION

SATELLITE COMMAND AND DATA ACQUISITION (CDA) FACILITY: The Satellite CDA Facilities Program ensures a robust facility and related infrastructure is available for supporting the continuous collection, processing and distribution of environmental data for the issuance of life saving NWS watches and short-term warnings to the public. NOAA's CDAS Infrastructure program at Wallops, VA, and Fairbanks, AK, enables the continuation of the current 99.9 percent data availability for NOAA environmental satellite systems. The Wallops and Fairbanks facilities continue to undergo significant infrastructure and building upgrades to replace aging infrastructure installed over 40 years ago. The program plans to update major systems operating well past their design lives based on a Facilities Master Planning Process that began for the Operating Stations in 1998. Both facilities continue to require maintenance, repair, and replacement, to aging systems.

The Fairbanks Satellite Operations Building replacement was completed in September of 2010 with ARRA funding, replacing a building crippled by severe weather conditions, poor foundations, and shifting soil conditions. Existing buildings and aging infrastructure continue to require resources to continue reliable operations. The Wallops facility, on the Atlantic coast, is subject to a corrosive salt air environment and lies in the path of hurricanes that hit the U.S. East Coast. The Wallops facility is undergoing major electrical infrastructure upgrades to support the reliability necessary to insure 99.9 percent of data is captured. Associated infrastructure is planned for maintenance, repair, and rehabilitation to support the various missions integral to both locations. Both stations have been determined to be critical national infrastructure elements by Presidential Decision Directive.

Funding for this budget line item is for repair and replacement of critical infrastructure components necessary to maintain the operational integrity of facilities. NOAA has developed facilities master plans for Wallops and Fairbanks facilities. In FY 2012, NOAA will continue to implement the facilities master plan for Wallops to support a phased, multi-year program to comprehensively renovate and modernize the facility, infrastructure, and equipment so as to minimize or eliminate safety hazards and hazardous materials, modernize waste water treatment, and other deficiencies that could lead to outages and service disruptions.

Schedule & Milestones:

- FY12: Complete Electrical Distribution System upgrades at Wallops CDAS
- FY13: Start Design for Electrical Distribution System upgrades at Fairbanks CDAS
  Execute Phase 4 of Road Repair Project at Fairbanks CDAS
- FY14: Complete Design and begin Electrical Distribution System upgrades at Fairbanks CDAS
- FY15: Start Design for Operations Building infrastructure upgrades at Wallops CDAS
  Complete Electrical Distribution System upgrades at Fairbanks CDAS
- FY16: Complete Design and begin Operations Building infrastructure upgrades at Wallops CDAS

Deliverables/Outputs:

- The Satellite CDA Infrastructure Program will complete the Electrical Distribution System upgrades at the Wallops CDAS, providing a modernized, robust and reliable Electrical Distribution System with increased capacity to meet current and future mission requirements.

Outyear Funding Estimates (BA in thousands)

Satellite CDA	FY 2011 & Prior	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	CTC	Total
Change from FY 2012 Base		-	-	-	-	-		
Total Request	$15,552	$2,228	TBD	TBD	TBD	TBD	TBD	TBD

PROGRAM CHANGES FOR FY 2012:

No program changes for this sub-activity.

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