



Space Studies Board Committee on Earth Science and Applications from Space

NOAA Satellite and Information Service Status Update

Mary E. Kicza
Assistant Administrator
July 10, 2012





Outline

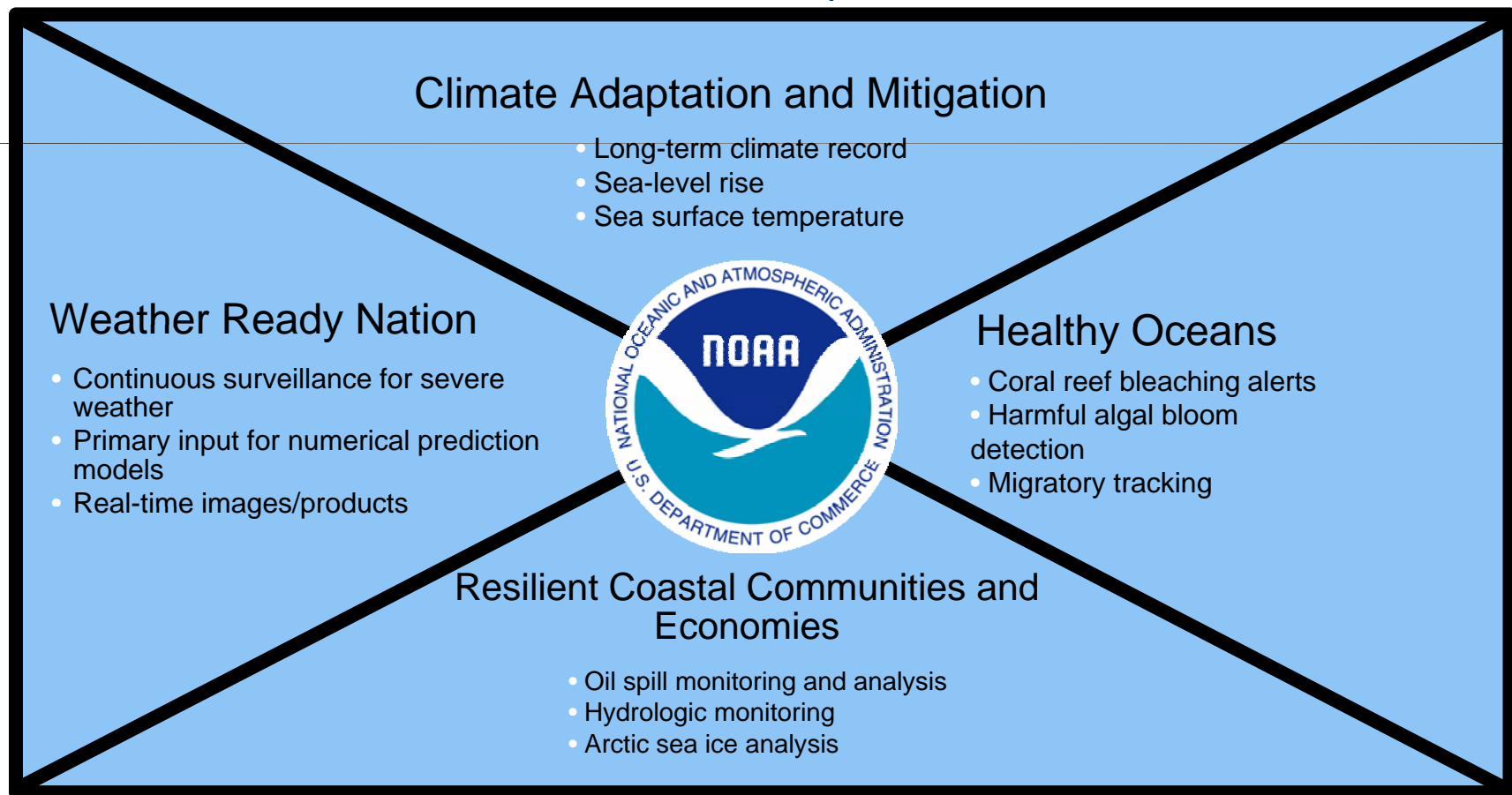
- NESDIS Overview
- Satellite Program Status
- International Partnerships
- Budget Update
- NESDIS Independent Review Team (IRT)
- Satellite Architecture Study
- 30-Day Enterprise Ground System Study (EGS)
- Current Challenges





NOAA/NESDIS Mission Supports NOAA's Mission and Goals

NOAA/NESDIS data products and services underpin and support NOAA's mission of Science, Service and Stewardship

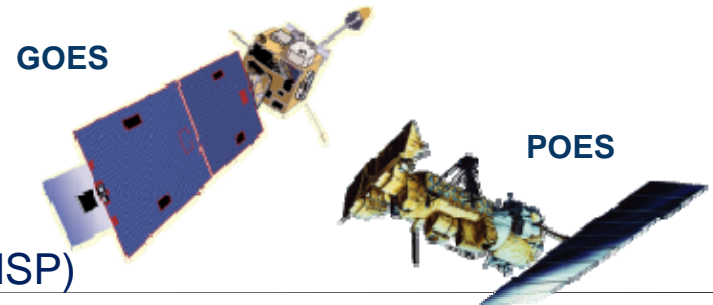




NESDIS Principal Activities

Providing On-Orbit Satellite Operations

- 24/7 Satellite operations and product processing
 - Geostationary satellites (GOES)
 - Polar-orbiting satellites (POES)
 - Defense Meteorological Satellite Program (DMSP)
 - DMSP is operated by NOAA on cost reimbursable basis for the Air Force
 - Jason-2 altimetry satellite (started in Fall 2008)



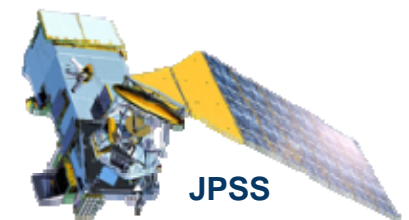
Acquiring Next Generation Satellites

- GOES-R Satellite Series
- Joint Polar Satellite System (JPSS)
- DSCOVR (Solar Wind Continuity)
- Jason-3 altimetry satellite



Providing Long Term Data Stewardship

- National Climatic Data Center
- National Oceanographic Data Center
- National Geophysical Data Center



GOES-R Overview



Benefits

- Maintains continuity of weather observations and critical environmental data from geostationary orbit
- Provides faster scanning of entire hemisphere while simultaneously observing individual storms
- Provides a new lightning mapping capability for improved early warnings of severe weather
- Provides improved warning of solar events to minimize impact to communications, navigation systems, and power grids

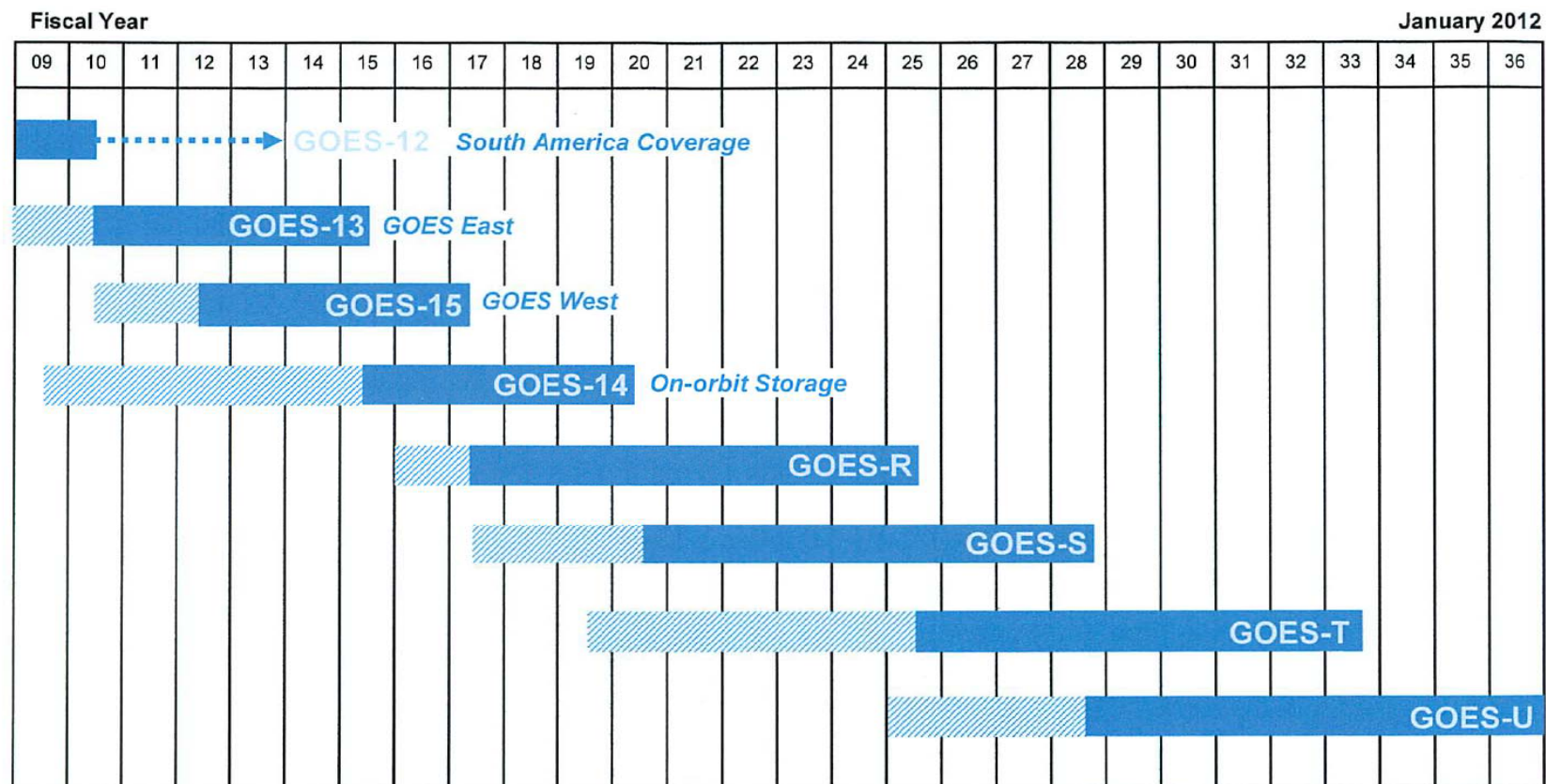


GOES-R Launch Readiness Date*	October 2015
Program Architecture	4 Satellites (GOES R,S,T&U), 10 year operational design life
Program Operational Life	FY 2017 – FY 2036
Program Life-cycle FY 2013 President's Budget	\$10.860 billion

*Launch Readiness Date based on FY 2013 President's Budget Request



Continuity of NOAA's Geostationary Operational Satellite Programs



Approved: May E. King
Assistant Administrator for
Satellite and Information Services

Signed on: 1/25/12

.....▶ Satellite is operational beyond design life

 Post Launch Test / On-orbit storage
 Operational



GOES-R Status

- GOES-R received \$617M in FY2012.
 - The Program continues to identify budget risk due to reduced funding in previous years, and has identified funding requirements in the event of a Continuing Resolution in FY 2013
-
- GOES-R achieved KDP-II and was approved to continue to Phase C on May 16, 2012.
 - Construction of GOES-R Antenna #1 and #2 at Wallops is proceeding ahead of schedule
 - Spacecraft successfully completed Systems CDR and the Ground System successfully completed Core CDR.
 - Currently preparing for Ground Segment Project CDR (week of July 23) and Mission CDR (week of July 30)
 - Instruments and algorithm development all progressing well





Joint Polar Satellite System (JPSS)

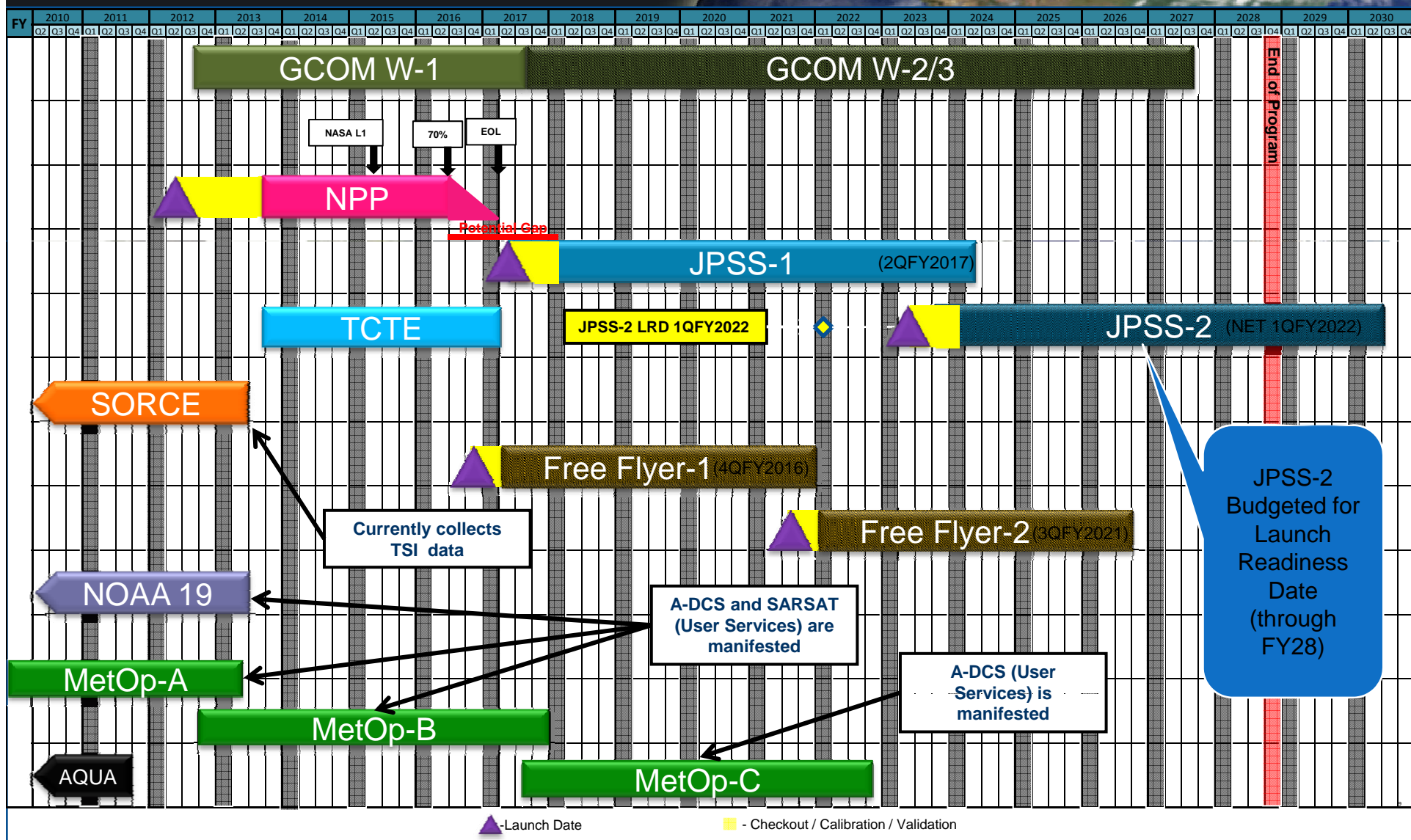
- JPSS will provide operational continuity of satellite-based observations and products for NOAA Polar-orbiting Operational Environmental Satellites (POES) and the Suomi National Polar Partnership (Suomi NPP) mission.
- JPSS-1 will fly the following instruments in the afternoon orbit:
 - Visible/Infrared Imager/Radiometer Suite (VIIRS)
 - Cross-track Infrared Sounder (CrIS)
 - Advanced Technology Microwave Sounder (ATMS)
 - Ozone Mapping and Profiler Suite –Nadir (OMPS-Nadir)
 - Clouds and Earth Radiant Energy System (CERES)**
- JPSS is responsible for developing the Total Solar Irradiance Sensor (TSIS) and accommodating the data communications packages (DCS and SARSAT)
- Spacecraft bus
 - Decision made to procure NPP-like spacecraft for JPSS-1
 - JPSS-2 will be subject to open competition
 - Freeflyer accommodations are under review

Launch Readiness Date	FY 2017 (JPSS-1)*; FY 2021 (JPSS-2)
Program Architecture	2 Satellites (JPSS-1 and JPSS-2) & 2 free-flyer satellites
Program Operational Life	FY 2016 – FY 2028
Program Life-cycle FY 2013 President's Budget	\$12.9 billion

** CERES, along with TSIS, is transferred from the NOAA Climate Sensor Program to JPSS



Polar-Orbiting Operational Satellite Fly-out





JPSS Status

- NOAA and NASA are in the process of operationalizing Suomi NPP
 - Calibration and Validation of the instrument suite continues and is progressing well
 - ATMS data currently being used operationally by the National Weather Service
- JPSS team recently updated plans and Program Office Estimate to reflect optimized content within Administration's funding profile and \$12.9B Life Cycle Cost
 - OMB provided approval to discuss POE with Congress. Briefings have been conducted with 5 Congressional committee staff
- JPSS proceeding to Program's KDP-0 milestone, having recently successfully completed the Program System Requirement Review
- Japan successfully launched GCOM W1 which will provide data crucial for tracking sea-surface temperatures and support near-real time weather and ocean forecasts. Japan is providing the data to the U.S. to fulfill our requirements for these observations





JPSS Image of the Month

June 2012 – VIIRS Fire Imagery

Whitewater-Baldy Complex fire, New Mexico is up to 259,025 acres burned. This image was taken by the VIIRS instrument aboard the Suomi NPP

spacecraft at 2015Z on June 4, 2012. The image combines high resolution bands 3, 2 and 1 to make the colored land areas and clouds. Bands 3 and 2 were also combined to highlight the burn scar in dark maroon, and moderate resolution channel 13 provided the data for the hotspots, shown in red and white on the periphery of the burn scars.

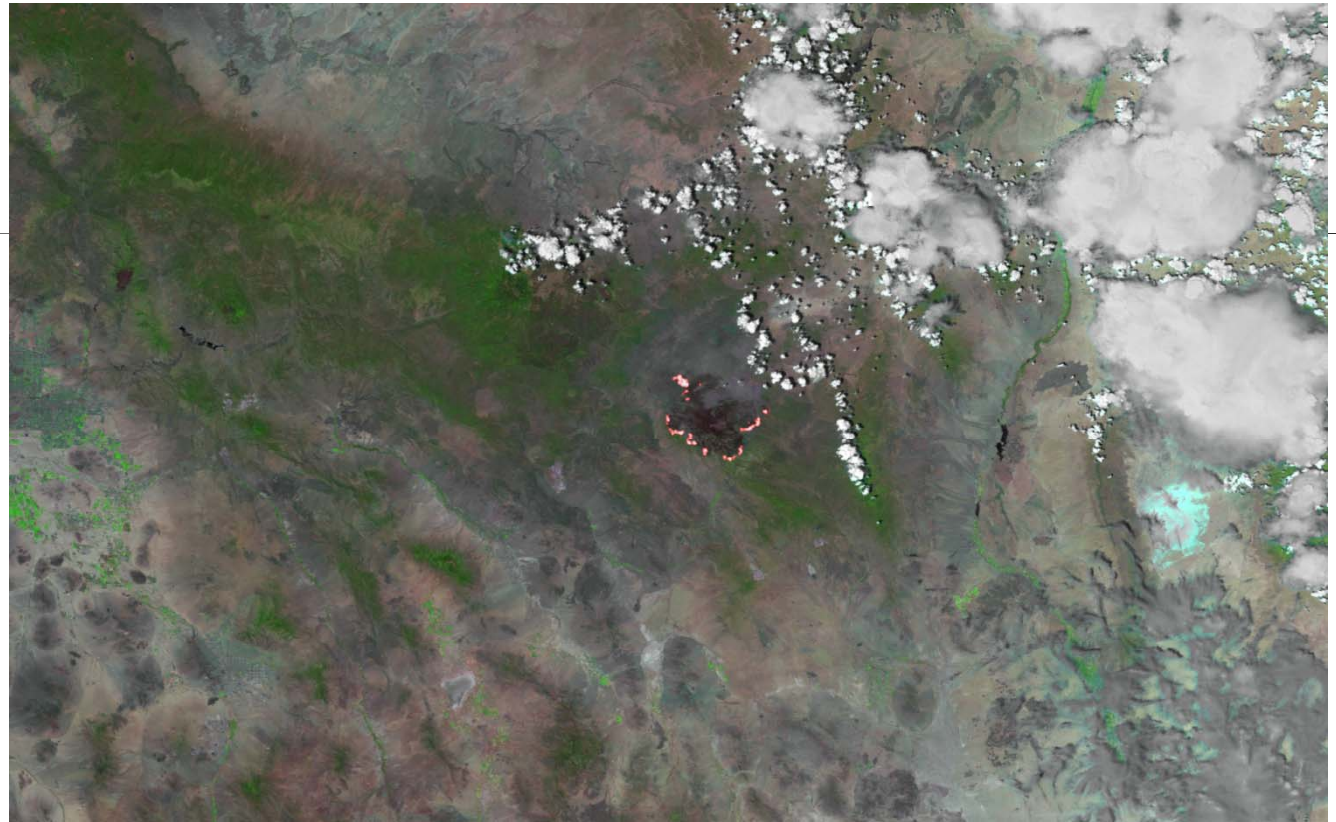


Image produced by the NOAA
Vislab





Jason-3 Altimetry Mission

(\$ in millions)	FY 2012 Spend Plan	Program Change	FY 2013 President's Request
PPA: Jason-3			
Jason-3	\$19.7	\$10.3*	\$30.0

- Funding continues the development of the Jason-3 satellite, a partnership between NOAA and EUMETSAT, the European Meteorological Agency.
- Jason-3 ensures continuity of space-based altimetry observations that started over 20 years ago with TOPEX Poseidon, and also provides data important to assessing and predicting hurricane intensity, surface wave forecasts and the monitoring of the development of El Nino/La Nina events
- Launch vehicle options are currently under review. Launch readiness date will be updated once Launch Vehicle is selected.
- Instrument development progressing well and on target for completion and delivery to CNES for spacecraft integration in February 2013
- NOAA Ground System is progressing well, with ground system equipment installation in Suitland and Wallops complete and Fairbanks installation planned for completion in late July

* Numbers may not add due to rounding and excluding inflationary adjustments





DSCOVER

Advanced Warning of Solar Storms

(\$ in millions)	FY 2012 Spend Plan	Program Change	FY 2013 President's Request
PPA: Deep Space Climate Observatory Mission			
DSCOVER	\$29.8	(\$6.9)*	\$22.9

- Provides advanced warnings of geomagnetic storms that could adversely affect power grids, telecommunications, satellite systems, and the health and safety of astronauts and airline passengers.
- NOAA has partnered with NASA and the Air Force to refurbish and launch DSCOVER as a space weather mission with a launch readiness date of 3rd Quarter FY 2014. USAF OSP-3 contract award expected this September
- DSCOVER Project grassroots budget and schedule review completed and approved, project re-baseline review held June 18/19
- DSCOVER spacecraft testing and completion of magnetic cleanliness analysis completed, awaiting testing report

* Numbers may not add due to rounding and excluding inflationary adjustments





International Partnerships

National Space Policy recognizes the importance of international partnerships. International partnerships are crucial to obtaining continuity, providing global observations and filling gaps

NOAA-EUMETSAT Joint Polar System agreements— polar orbiting satellite systems in complementary orbits, options for exchange of key instruments, sharing of data

NOAA,EUMETSAT,NASA, CNES and ESA agreements for JASON-2, JASON-3 ocean altimetry missions and discussion ongoing for JASON-CS (follow-on)

NOAA-JAXA agreement for JAXA's Global Change Observation Missions

AIT-TECRO (Taiwan) for COSMIC-2 GPS radio-occultation mission

NOAA-EUMETSAT-JMA agreements for backup in case of failure of geostationary weather satellites

U.S., Canada, France, Russia International Cospas-SARSAT Programme agreements to support international search and rescue capability

NOAA-CNES- EUMETSAT agreements to exchange and operate Argos instruments on polar orbiting satellites

NOAA-NASA-ISRO agreements for Oceansat-2 scatterometer and ocean color





NESDIS Budget Overview

(\$ in millions)	FY 2012 Spend Plan	Program Change	FY 2013 President's Request
Subtotal Operations, Research, and Facilities (ORF)	\$181.2	\$8.3	\$191.1
Subtotal Procurement, Acquisitions, and Construction (PAC)*	\$1,696.6	\$153.7	\$1,850.3
GOES-R	\$615.6	\$186.4	\$802.0
JPSS	\$924.0	(\$33.5)	\$916.4
Restoration of Climate Sensors	\$25.9	XFER to JPSS	XFER to JPSS
Jason-3	\$19.7	\$10.3	\$30.0
DSCOV	\$29.8	(\$6.9)	\$22.9
NESDIS Total	\$1,877.8	\$162.0	\$2041.4**

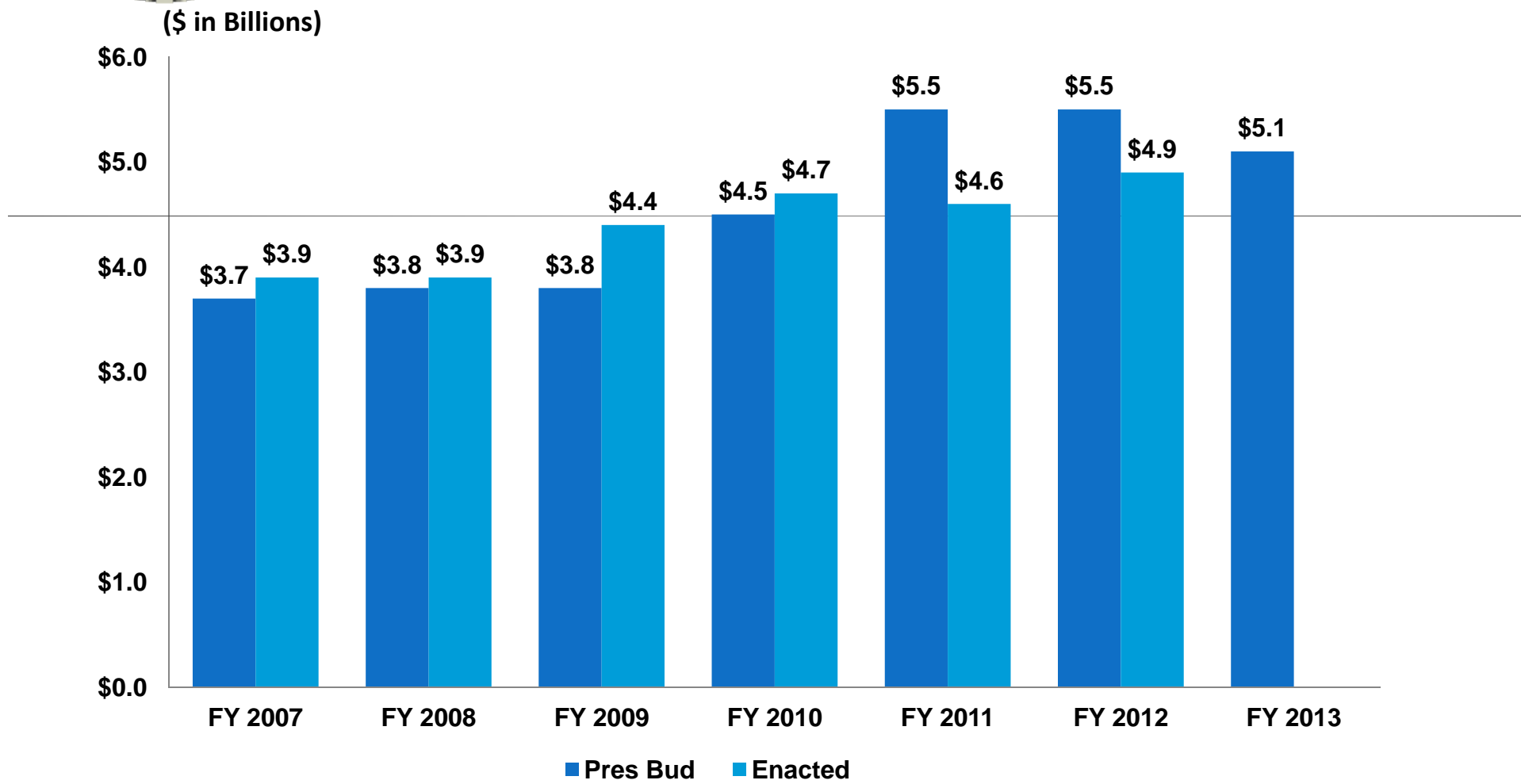
* Not shown under the PAC line are GOES-N, POES, Data and Other Systems Investment (e.g., CLASS, NDE, Satellite CDA facility, and EOS archive enhancements, critical single point of failure).

** FY 2013 total of \$2041.4 includes \$1.5M for inflationary adjustments. This yields a delta of \$163.2M from FY12 Enacted to FY13 PBR.





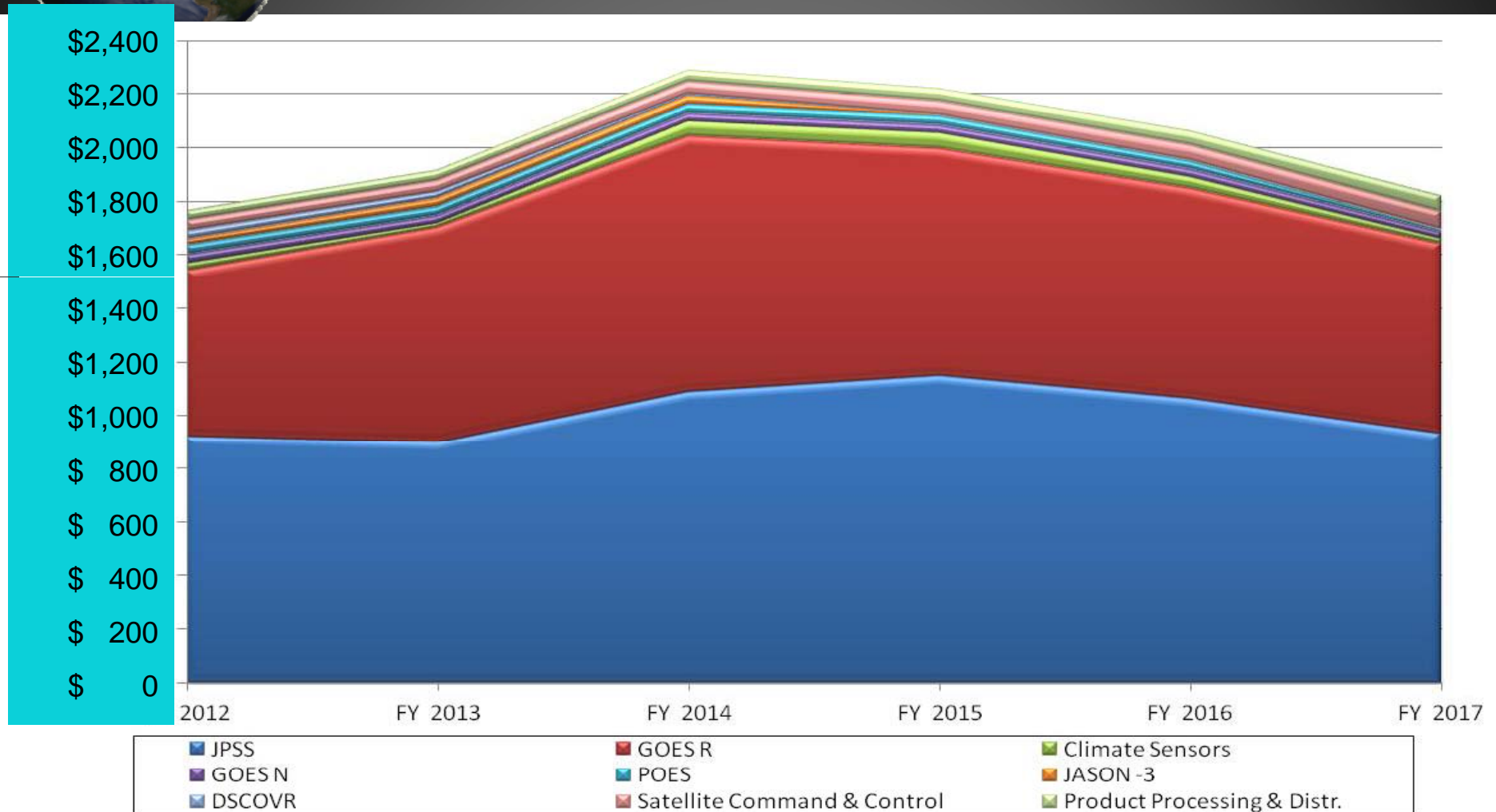
NOAA Budget Trend – (FY 2007 to FY 2013)





NESDIS Satellites

Acquisitions, Operations, and Distribution- Current Programs Only
FY 2012-2017 Funding Profile (\$M)



Data Source: FY 12: FY12 Conference Mark (ORF & PAC), FY 13-17: FY 13 OMB Submission profiles (PAC), FY 13-17: Included NASA 2010 Indices Inflationary Factors (ORF)





NESDIS Independent Review Team Review Summer 2012

IRT was asked to take a broad perspective, and look at the entire NESDIS portfolio, given the significant fiscal and organizational challenges we face now and in the coming years.

NOAA will use the IRT report and recommendations to support our becoming a stronger team in providing as robust an environmental satellite constellation as possible.

IRT was expected to probe the NESDIS Enterprise, examining:

- Program Cost, Scope and Schedule realism in light of budget availability
- Soundness, at a top level, of acquisition, budget and management planning
- Major challenges, both technical and non-technical,
- Risk identification, mitigation and management planning
- Constraints and burdens on authorities and abilities to execute programs
- Level of oversight employed and the value this provides

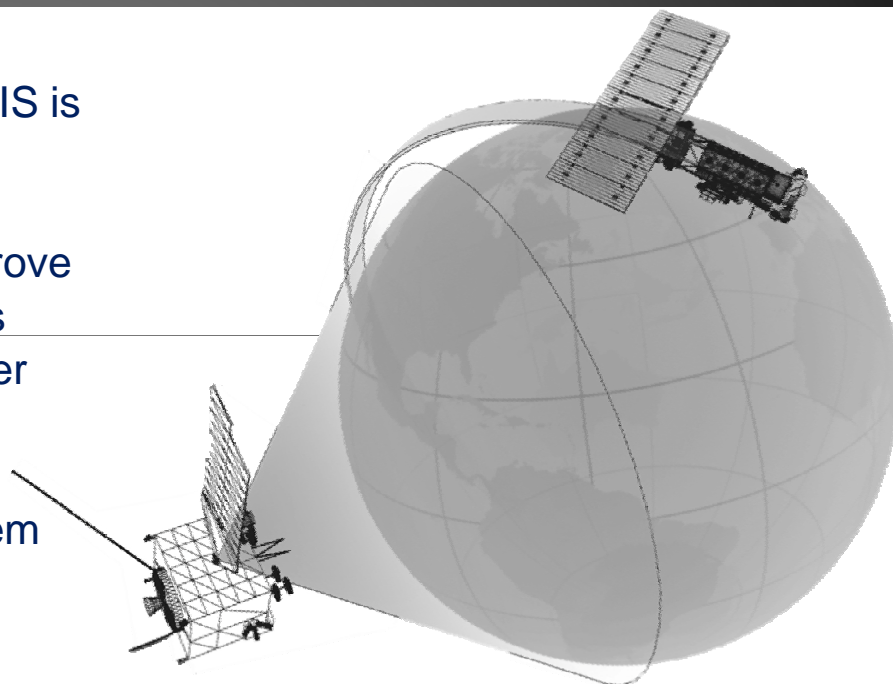




NESDIS Satellite Future Architecture Studies

In light of the austere budget environment, NESDIS is undertaking a review of its satellite and ground architectures

- Examining future architectures which may prove more resilient in the face of reduced budgets
 - Space architecture options include fewer instruments on smaller buses
 - Ground architecture options include transitioning to a common ground system



The study is underway and is expected to be completed by the end of Summer 2012.

Utilizing Aerospace Concept Design Center

Results reviewed by NOAA Science Advisory Board (SAB)

Satellite Task Force reviewing NESDIS efforts, preliminary report to SAB July 16, 2012

SAB recommendations to NOAA -- Fall 2012





Current Challenges

- **NOAA's satellite acquisition efforts include two major development efforts, both of which require significant investment in an austere budget environment.**
- **Congressional appropriations for satellites over the past several years have been below the President's budget request**
 - **The level of funding received in FY12, although below request, was critically important to allowing the major development efforts to move forward**
 - **The President's FY13 Budget allows these programs to remain on schedule for their planned launches**
- **NOAA is in consultation with Administration officials examining the significance of the Senate's proposal to transfer JPSS and GOES-R funding to NASA**





Space Studies Board Committee on Earth Science and Applications from Space

Backup





NESDIS Independent Review Team (1 of 2)

IRT Member	Previous Experience
Tom Young	<ul style="list-style-type: none">• President, Martin Marietta Corporation• Director, Goddard Space Flight Center• Chairperson of numerous IRTs for civil and national security sectors
Thomas Moorman, General, USAF (Retired)	<ul style="list-style-type: none">• Vice Chief of Staff, United States Air Force• Commander, Air Force Space Command• Director, National Reconnaissance Office (NRO)• Recipient of Space Foundation Lifetime Achievement Award
Ronald Fogleman, General, USAF (Retired)	<ul style="list-style-type: none">• Chief of Staff, United States Air Force• Founder of Durango Group• Board member of numerous companies
Joe Rothenberg	<ul style="list-style-type: none">• Associate Administrator for Space Flight, NASA HQ• President & Board Member, Universal Space Networks• Director, Goddard Space Flight Center
Bill Ballhaus	<ul style="list-style-type: none">• President & CEO, Aerospace Corporation• Board of Directors, Space Foundation
Dolly Perkins	<ul style="list-style-type: none">• Deputy Director, Technical, Goddard Space Flight Center• Director, Flight Projects, Goddard Space Flight Center





NESDIS Independent Review Team (2 of 2)

IRT Member (Continued)	Previous Experience
Don Hard, Maj Gen, USAF (Retired)	<ul style="list-style-type: none"> • Director of Space and Strategic Defense Initiative Programs • Vice Director, Secretary of the Air Force Office of Special Projects • Commander, Air Force Satellite Control Facility
Dr. John Schaake	<ul style="list-style-type: none"> • Deputy Director of the Hydrologic Research Laboratory, NWS • Deputy Director of the Office of Hydrology, NWS • Office of Hydrological Development, NWS
Dr. Berrien Moore	<ul style="list-style-type: none"> • VP For Weather & Climate Programs, University of Oklahoma • Executive Director, Climate Central • Director, Institute for the Study of Earth, Oceans and Space, University of New Hampshire
Bill Townsend	<ul style="list-style-type: none"> • Standing Review Board Chair, GOES-R • VP, Exploration Systems, Ball Aerospace & Technologies Corp. • Deputy Director, Goddard Space Flight Center
Joe Straus	<ul style="list-style-type: none"> • Executive Vice President, Aerospace Corporation • Chair, Space Communications and Navigation Committee, International Astronautical Congress • Standing Review Board Chair, JPSS





SATTF Members

Robert Winokur, Chair

- Deputy and Technical Director (Acting Oceanographer of the Navy)
- Oceanography, Space and MDA Division, Chief of Naval Operations

Dolly Perkins, consultant

- Former Deputy Center Director - Technical
- NASA Goddard Space Flight Center

Robert E. Gold

- Space Department Chief Technologist
- The Johns Hopkins University Applied Physics Laboratory (JHU/APL)

Thomas C. Adang

- Systems Director, The Aerospace Corporation
- Department of Defense - Operationally Responsive Space (ORS) Office

Michael D. Tanner

- Acting Deputy Director, National Climatic Data Center

Paul Menzel

- Professor/Senior Scientist, University of Wisconsin
- Formerly Chief Scientist, NESDIS STAR

Diane Evans

- Director, JPL Earth Science and Technology Directorate

J. Marshall Shepherd, SAB Liaison

- Department of Geography/Director, Atmospheric Sciences Program, University of Georgia

David Hermreck, NESDIS Liaison

- Senior Advisor, NESDIS Office of Systems Development

