



Space Studies Board Meeting



Mary E. Kicza

Assistant Administrator for Satellites and
Information Services

May 14, 2009



Summary

- Budget Update
 - FY 2009 Stimulus (ARRA)
 - FY 2009 Omnibus
 - FY 2010 President's Budget
- Current NOAA Satellite Programs
- Climate Sensors
- Decadal Survey
- Other Topics



FY 2009 American Recovery and Reinvestment Act (ARRA)

- NOAA will receive \$830M in ARRA funding
- NESDIS is expected to receive \$74M in ARRA funding
 - To accelerate development of the National Polar-orbiting Operational Environmental Satellite System (NPOESS) and climate sensors for these satellites

FY 2009 Omnibus Appropriations

- The NOAA FY 2009 Budget is \$4,356M
- NESDIS FY 2009 Budget is \$1,178M
 - This is a \$240M increase from FY 2008
- This budget request will allow the continuation of NOAA's satellite and information services, satellite and data acquisitions, analyses, and archiving and supporting infrastructure.

FY 2010 PRESIDENT'S BUDGET

NOAA's FY 2010 is \$4,484M

NESDIS FY 2010 Budget is \$1,429M

- \$1,257M for PAC (Procurement, Acquisition, and Construction)
- \$172M for ORF (Operations, Research, and Facilities)

Significant Changes in FY 2010 Budget

- \$272M increase: To GOES-R to provide continued satellites engineering development and production activities
- \$94M increase: To NPOESS for the development and product of the NPOESS spacecraft and instruments, ground system readiness, and operations and maintenance
- \$20M increase: For the Jason-3 Altimetry Mission to initiate a satellite altimetry mission to provide continuity of precise measurement of sea surface height for ocean climatology and ocean weather applications
- \$12M increase: NPOESS Preparatory Data Exploitation, Climate Data Records, Sea Ice Data Buy, ATB
- \$112.0M decrease: GOES-N, POES Prime, Climate Sensor ARRA adjustment



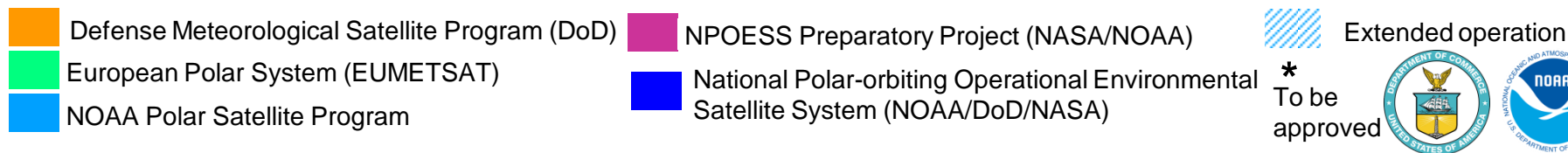
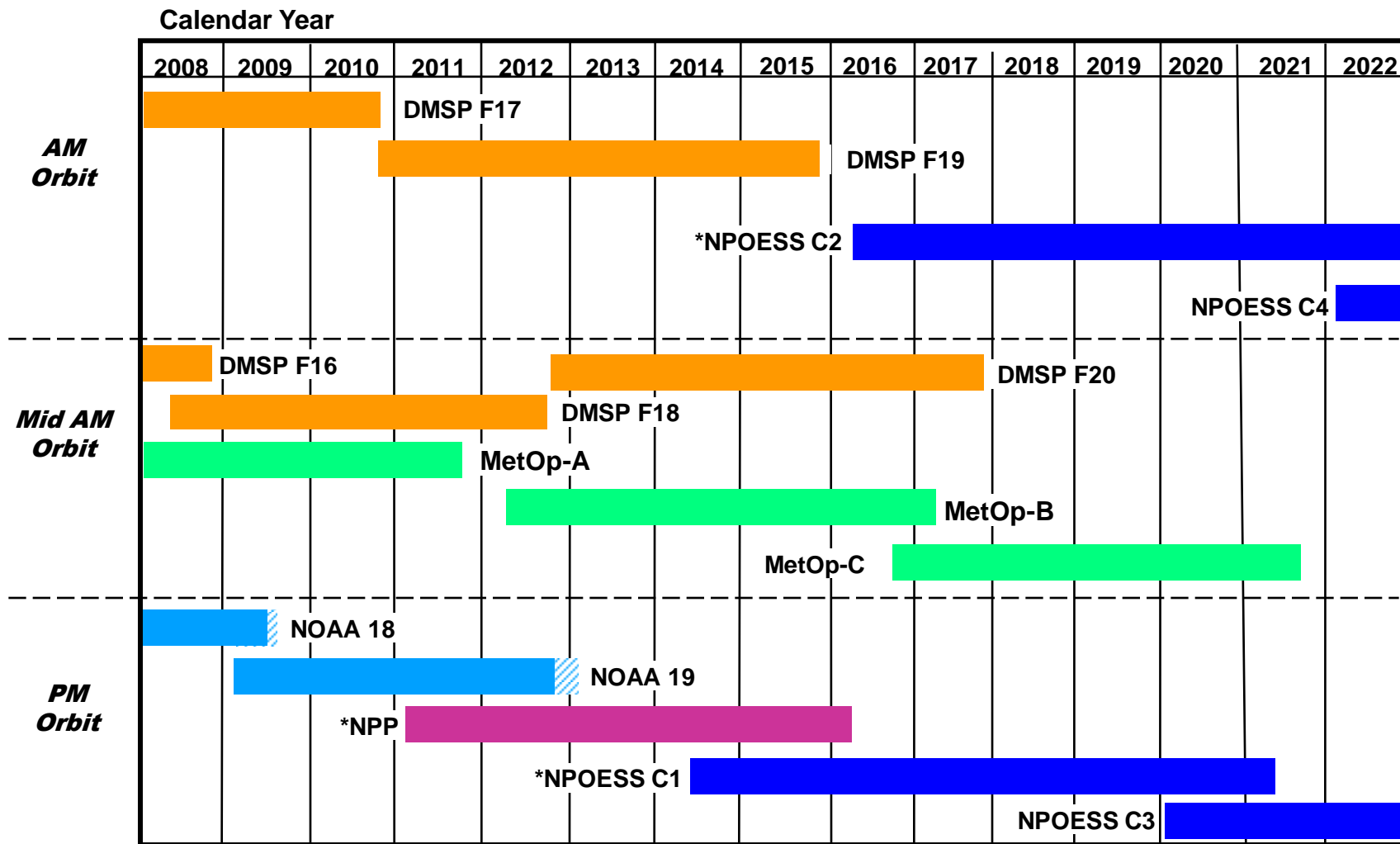
FY 2010 PRESIDENT'S BUDGET

\$ in Millions

Environmental satellite Observing Systems	\$	110.5
NOAA's Data Centers & Information Services	\$	61.2
TOTAL ORF	\$	171.7
POES	\$	43.1
NPOESS	\$	382.2
Jason-3	\$	20.0
GOES N- Series	\$	57.6
GOES R- Series	\$	737.0
Other Satellite Activities (NDE, CLASS, etc)	\$	16.9
TOTAL PAC	\$	1,256.9
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TOTAL NESDIS FY 2010 PRESIDENT'S BUDGET	\$	1,428.6



Current NOAA Satellite Programs – Polar Operational Satellite Continuity



Current NOAA Polar Satellite Programs

POES Program:

- NOAA is currently operating five POES satellites:
 - NOAA-17 & 18 (primary operational satellites)
 - NOAA-15 & 16 (satellites still providing important data)
- NOAA's newest POES satellite (NOAA-19) was launched on February 6, 2009 at 2:22 PST from Vandenberg AFB, CA. This is the final satellite in the POES series.
- NOAA also supports three other polar satellite missions: DMSP, MetOp-A, and Jason-2.



Launch of NOAA-19

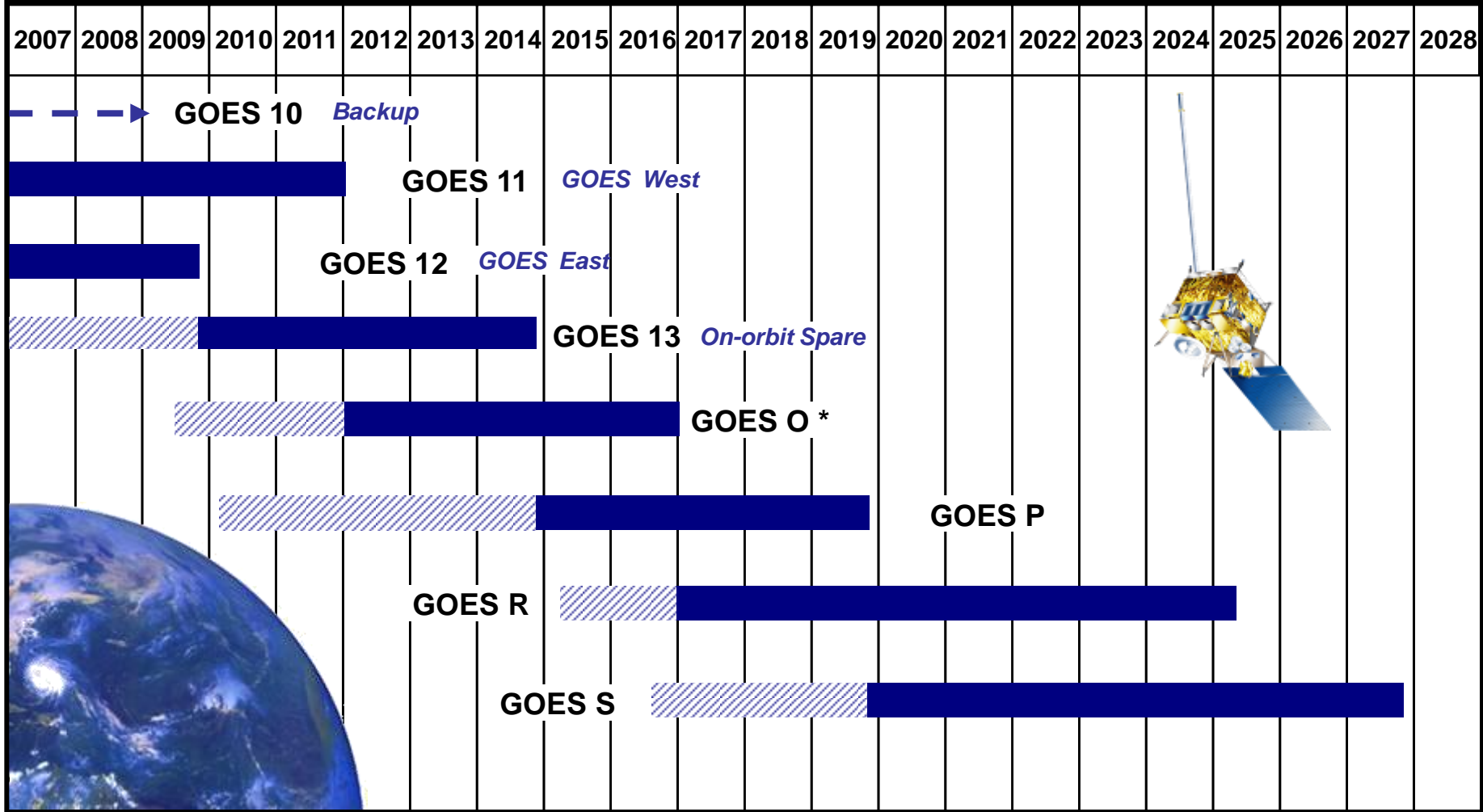
NPOESS Program:

- VIIRS instrument has begun thermal-vacuum (TVAC) testing for the NPOESS Preparatory Program (NPP) satellite.
- NPOESS System Critical Design Review milestone held 20-24 April 2009
- Despite recent progress, NPOESS remains a major challenge:
 - Instrument delivery issues will likely cause a slip in projected launch schedules.
 - Tri-agency partners (NOAA, NASA, DOD/USAF) are examining options for restructuring the program management and development activities to get NPOESS back on track.




Current NOAA Satellite Programs – GOES Satellite Continuity

Calendar Year



* Launch currently projected for NET June 26, 2009

-  Satellite is operational beyond design life
-  On-orbit GOES storage
-  Operational



Current NOAA Geostationary Satellite Programs

GOES Program:

- NOAA is currently operating four GOES satellites:
 - GOES-10 (positioned at 60° for coverage over South America)
 - GOES-11 / GOES-West (positioned at 135°)
 - GOES-12 / GOES-East (positioned at 75°)
 - GOES-13 (in-orbit spare)
- GOES-O is undergoing preparations for launch from Cape Canaveral NET June 26, 2009.
- GOES-P scheduled for launch in early 2010.



GOES-O Fairing

GOES-R Program:

- Spacecraft contract re-awarded on May 7, 2009 to Lockheed-Martin Space Systems to build the new GOES-R and GOES-S spacecraft.
- Ground segment contract going thru final source selection evaluations with award tentatively scheduled for June 2009.
- GOES-R antenna draft Request for Proposals to be released June 9, 2009.
- GOES-R launch readiness date: April 2015.



NRC Report on NOAA Climate Sensors

Response to the National Research Council (NRC) Report: *Ensuring the Climate Record from the NPOESS and GOES-R Spacecraft: Elements of a Strategy to Recover Measurement Capabilities Lost in Program Restructuring*

- *NRC Committee on a Strategy to Mitigate the Impact of Sensor Descopes and Demanifests on the NPOESS and GOES-R Spacecraft*
- Briefed to NOAA on July 8, 2008, by Antonio J. Busalacchi, Jr., Director, Earth System Science Interdisciplinary Center, University of Maryland





Recovery of NPOESS Climate Sensors

CERES FM-5 delivered and integrated onto NPP spacecraft,
Fall 2008

CERES FM-6 and TSIS #1 delivery dates are planned to
meet the NPOESS C1 integration and test schedule

Options for continuity beyond NPOESS C1 are being
examined

- Includes CERES, TSIS, OMPS and APS. Altimetry being looked at in the context of a JASON-2 follow on.
- NPOESS, government and/or commercial free flyers under consideration



Status of NRC Decadal Survey Key Recommendations

Recommendation: *“NOAA should transition to operations three research observations. These are vector sea-surface winds; GPS radio occultation temperature, water vapor, and electron density soundings; and total solar irradiance (restored to NPOESS).”*

Approaches to these transitions are provided through the recommended

- *Ocean Surface Vector Winds (XOVWM),*
- *Global Positioning System Radio Occultation (GPSRO), and*
- *Climate Absolute Radiance and Refractivity Observatory (CLARREO) missions.”*



Decadal Survey Recommendations - NOAA Response

Extended Ocean Vector Winds Mission (XOVWM)

- Consistent with congressional language to both NOAA and NASA in FY 2009 Omnibus appropriations bill, NOAA is using existing resources and working with NASA to define and study scatterometer design concepts to meet our ocean surface vector winds (OSVW) requirements
- NOAA and JAXA signed Joint Letter of Intent for GCOM / NPOESS cooperation on March 4, 2009
 - Cal/Val, data exchange, and data relay support
 - NOAA access to GCOM-W (Water Cycle observation) – series of 3 satellites, beginning in 2012 and GCOM-C (Climate observation) – series of 3 satellites
 - Potential for hosting scatterometer on GCOM W (2nd and 3rd satellites)
- Evaluating the use of METOP / ASCAT data in weather forecasts and NWP models as potential mitigation in event of QuikSCAT failure



Decadal Survey Recommendations - NOAA Response

Operational GPS Radio Occultation (GPSRO)

- Supporting Constellation Observing System for Meteorology, Ionosphere and Climate (COSMIC) operations through FY 2011
 - NESDIS operates three ground stations in Alaska, Norway, and Virginia
- Using COSMIC real-time data operationally in NCEP numerical weather prediction models since May 2007
 - ~8 hours of skill improvement in Day 5 forecast
- Planning for follow-on capability by exploring available options (government, commercial, government-commercial-international partnerships)
 - Evaluating responses to RFQ study reports, completed in December 2008
 - Coordinating COSMIC-2 plans and mission requirements with Taiwan's National Space Organization
 - Potential NOAA contributions: instruments, ground station support, launch vehicle support
 - Exploring government-commercial partnerships through either data buys or hosted payloads on commercial satellites



Decadal Survey Recommendations - NOAA Response

Climate Absolute Radiance and Refractivity Observatory (CLARREO)

- Participating with NASA on mission definition and implementation strategy
 - Supported two NASA CLARREO workshops, including May 12-15 workshop in Hampton, VA
- Working to ensure that long-term climate sensor plans for TSIS and CERES are in step with NASA plans for CLARREO



Radar Altimetry

- **Transitioned Jason-2 to NOAA and EUMETSAT for routine operations, October 2008**
- **NOAA and EUMETSAT co-lead a CEOS Constellation on Ocean Surface Topography**
 - Writing a Mission Requirements Document for the Altimeter Constellation laying basis for coming 15 years—due end of summer
- **FY 2010 budget includes \$20 million for Jason-3**
 - To initiate a satellite altimetry mission to provide continuity of precise measurement of sea surface height for ocean climatology and ocean weather applications
 - \$18M for procurement of satellite components (Microwave Radiometer, GPS Receiver, and laser ranging reflector)
 - \$2M toward launch service procurement
 - Targeting a 2013 launch to ensure overlap with Jason-2, which is essential for maintaining continuity of the Climate Data Record for sea level



Ozone Mapping and Profiler Suite (OMPS) Limb sensor

- Integrated onto NPP in fall 2008
- Examining long-term options
 - NPOESS C-3 and follow-on
 - Request for Quotation on technical feasibility and pricing
 - ~ July 2009, will award up to 3 study contracts for up to \$25K for commercial data-buys or hosted payloads on commercial satellites



Aerosol Polarimetry Sensor (APS)

- NOAA is monitoring NASA's development of APS on GLORY mission
 - To be launched no earlier than January 2010, according to NASA
- Examining long-term options for follow-on capabilities
 - NPOESS C-3 and follow-on
 - Smallsat, free-flyer
 - Request for Quotation on technical feasibility and pricing
 - ~ July 2009, will award up to 3 study contracts for up to \$25K for commercial data-buys or hosted payloads on commercial satellites





Geostationary High Spectral Resolution Sounding

- NRC Decadal Survey recommended plan for the earliest possible flight of a geostationary hyperspectral sounder
- NOAA exploring options for obtaining this type of capability in the GOES-T or later time frame, including possible international partnerships
 - GOES-R Series spacecraft being scarred to accommodate advanced capabilities
- Commercial options also being explored
 - Request for Quotation issued March 20 for advanced geostationary sounding capability as either commercial data buy or hosted payload on commercial satellite
 - Proposals being evaluated. Award expected in May for 90-day study contracts

Space Weather

- The Committee for Space Environmental Sensor Mitigation Options (CSESMO), under the National Space Weather Program (NSWP) and OFCM is responding to the Oct 08 Office of Science and Technology Policy (OSTP) request for Solar wind observing continuity and NPOESS space environmental sensing mitigation options.
 - Initial results briefed at CSESMO meeting on May 8th
 - Three Solar Wind continuity Options (DSCOVN Refurbishment; Commercial Data Buy, Government Developed Satellite)
 - NPOESS Mitigation Options being developed, cost analysis underway
 - Status report to be presented to OSTP in mid-June via NSWP Council meeting
 - Study results to be reported to Sep/Oct 09 timeframe



Research Topics for CES to Consider

Develop national needs and associated observational requirements for continuing U.S. ocean color capability in space post SeaWiFS / MODIS

- Discussing with Ocean Studies Board (OSB), who will work with the Earth Science Committee of the Space Studies Board (SSB)
- April 13, 2009, meeting between NOAA and OSB to finalize NOAA perspective on Statement of Task. All parties are very close to final agreement

Propose optimal strategy and implementation approach for maintaining continuity of U.S. operational environmental satellite capabilities

- Review the NOAA satellite strategic process for documenting requirements, identifying gaps, and proposing solutions for satellite continuity
- NOAA preparing draft statement of task language to be discussed with SSB in coming months

