FY 2018 NOAA Satellites Budget Comparison

Update 1

President's FY 2018 Budget Request; FY 2017 Consolidated Appropriations Act (P.L. 115-31)

This document provides an overview of the President's FY 2018 NOAA Budget request in comparison with the FY 2017 Consolidated Appropriations Act.

NOAA Satellites (NESDIS Systems Acquisition) – FY 2018 Funding

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
Satellites		
Geostationary Systems – R Series	870.143	518.532
Altimetry Mission - Jason-3	7.444	0.0
Polar Orbiting Systems - Joint Polar Satellite System (JPSS)	807.439	775.777
Polar Follow-On	369.300	179.956
Cooperative Data and Rescue Services (CDARS) (formerly SIDAR)	0.499	0.500
Deep Space Climate Observatory (DSCOVR)	3.194	0.0
Space Weather Follow-On	1.198	0.500
COSMIC-2/Global Navigation Satellite System Radio Occultation (GNSS RO)	10.081	6.100
Satellite Ground Services	53.898	53.000
Systems Architecture and Advanced Planning (SAAP)	3.922	4.929
Projects, Planning and Analysis	25.152	37.185
Commercial Weather Data Pilot	2.994	3.000
Total	**2,155.264**	**1,579.479**

President's FY 2018 Budget Request for NOAA Satellites

In FY 2018 the President's budget request included $1,579.479 million for NOAA satellites, $575.785 million less than the funds appropriated for NOAA satellites in FY 2017.

Geostationary Operational Environmental Satellite–R (GOES-R)

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
GOES-R	870.143	518.532
Total	870.143	**518.532**

Mission

The Geostationary Operational Environmental Satellite –R (GOES-R) Series is a collaborative development and acquisition effort between NOAA and NASA to develop, deploy and operate the next-generation geostationary environmental satellite series that will provide timely and accurate weather forecasts, severe storm tracking, space weather monitoring, and meteorological research. The GOES-R series will incorporate new instruments with increased capability over the incumbent GOES-N series, such as providing imagery five times faster and at four times higher resolution. It will also improve its ground system, which will provide better data products for National Weather Service (NWS) and other NOAA stakeholders. The first GOES-R series satellite successfully launched in November 2016, and should be fully operational by fall of 2017.

President's FY 2018 NOAA Budget Request:

- The President requested $518.532 million for GOES-R, $351.611 million below its FY 2017 enacted budget.

Jason-3

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
JASON-3	7.444	0.0
Total	**7.444**	**0.0**

Mission

The JASON-3 satellite is a joint satellite altimetry mission between NOAA, NASA, the Centre National d'Etudes Spatiales (CNES, the French Space Agency) and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT). Jason-3 will provide continuity of precise measurement of sea surface heights for applications in ocean climatology and ocean weather. NOAA is providing 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. EUMETSAT and CNES are providing the spacecraft, altimeter, additional precision orbit components, ground system and operations.

President's FY 2018 NOAA Budget Request:

- The President requested that funding for NOAA's involvement in the JASON-3 mission be eliminated.

Joint Polar Satellite System (JPSS)

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
JPSS	807.439	775.777
Total	**807.439**	**775.777**

Mission

The Joint Polar Satellite System (JPSS) is the United States' next generation polar-orbiting operational environmental satellite system. JPSS is a collaborative program between the National Oceanic and Atmospheric Administration (NOAA) and its acquisition agent—National Aeronautics and Space Administration (NASA). This interagency effort is the latest generation of U.S. polar-orbiting, non-geosynchronous environmental satellites. Established in February 2010 in the President's Fiscal Year 2011 budget request as the civilian successor to the restructured National Polar-orbiting Operational Environmental Satellite System (NPOESS), JPSS will provide continuity of critical, global Earth observations—including oceans, clouds, ozone, snow, ice, vegetation and atmosphere through 2028. The global environmental data from JPSS will be fed into Numerical Weather Prediction (NWP) models for forecasts and used for climate monitoring.

President's FY 2018 Budget Request:

- The President requested $775.777 million for JPSS, $31.662 million below its FY 2017 enacted budget.
- FY 2018 funding will support:
    - Continued development and launch preparation activities for launch of the JPSS-1 satellite, anticipated by the end of FY 2017.
    - Development of spacecraft and instruments for the JPSS-2 satellite, and any supporting capabilities for its launch by the 4th quarter of FY 2021.

Polar Follow-On

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
Polar Follow-on	369.300	179.956
Total	**369.300**	**179.956**

Mission

Polar orbiting satellites provide the primary input (up to 85%) of the data needed for NOAA's Numerical Weather Prediction models, the underpinnings of high impact weather forecasts. These data are increasingly important to emergency managers in the public and private sectors and are key inputs to critical decisions related to protection of life and property, such as evacuations and the staging of resources.

Polar Follow-ON (PFO) is critical to continuing NOAA's polar weather satellite observations after JPSS-2. PFO will achieve robustness in the polar weather constellation as early as FY 2023 and minimize the potential for gaps in polar weather data. The PFO implements a strategic procurement and management plan that will allow NOAA to move the polar satellite mission toward robustness as expeditiously as

possible while realizing significant efficiencies and cost savings. The PFO consists of two primary missions: JPSS-3 and JPSS-4.

President's FY 2018 NOAA Budget Request:

- The President's budget requests $179.956 million, $189.344 million below its FY 2017 enacted budget.

Cooperative Data and Rescue Services (CDARS) (formerly SIDAR)

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
Cooperative Data and Rescue Services (CDARS)	0.499	0.500
Total	**0.499**	**0.500**

Mission

The CDARS program supports the space-based components of both the Argos and Search and Rescue systems. The Argos system "provides worldwide coverage that gives the satellite the unique ability to geographically locate a data source from anywhere on earth." Its Advanced Data Collection System (A-DCS) gathers important environmental data from fixed and mobile platforms worldwide. The Search and Rescue Satellite Aided Tracking (SARSAT) System can locate individuals in distress "almost anywhere in the world at any time and in almost any condition."

These systems currently rely on instruments onboard satellites operating past their design lives. If NOAA is not able to deliver new instruments to space before a gap in services occurs, there will be an increase in wait times for SARSAT and possible data loss for Argos.

As part of the CDARS project, NOAA continues important collaboration with the French Space Agency (CNES) and the Canadian Department of National Defense (DND). CNES and DND are jointly providing the Search and Rescue Satellite Aided Tracking (SARSAT) system instrument and CNES is providing the Advanced Data Collection System (ADCS) instruments. The SARSAT and ADCS instruments have already been built and paid for by NOAA's Canadian and French partners, which have already contributed approximately $100 million to the project.

President's FY 2018 Budget Request:

- The President requested $500 thousand for CDARS, $1,000 above the FY 2017 enacted budget.

Deep Space Climate Observatory (DSCOVR)

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
DSCOVR	3.194	0.0
Total	**3.194**	**0.0**

The maintenance and operations of NASA's Deep Space Climate Observatory (DSCOVR) satellite allows continuity of solar wind data used for geomagnetic storm warnings. NOAA operates and manages the

DSCOVR mission as the front line sentinel to give notice of approaching geomagnetic storms with potentially calamitous consequences for terrestrial electrical grids, communications, GPS navigation, air travel, satellite operations, and human spaceflight. This program was developed in partnership with NASA, which refurbished the satellite and developed the ground system, and with the U.S. Air Force (USAF), which provided the launch services for the mission.

DSCOVR is positioned between Earth and the sun, observing and providing advanced warning of particles and magnetic fields emitted by the sun, known as solar wind. Like terrestrial weather in Earth's atmosphere, space weather refers to conditions, like solar wind, in near-Earth space. From its post at the Lagrange point 1 (or L1), approximately one million miles from Earth, DSCOVR is positioned to provide early warning when the solar wind displays characteristics that cause a geomagnetic storm. Solar wind observations are the only data source to support 15 to 45 minute lead time for geomagnetic storm warnings.

DSCOVR also carries two Earth remote sensing instruments provided by NASA. The Earth Polychromatic Camera (EPIC) takes continuous full disk images of Earth and the NIST Advanced Radiometer (NISTAR) takes continuous full disk measurements of the earth's radiation balance. NOAA provides the level 0 data stream to NASA, and NASA provides data processing and all higher level data products. The President's budget request would eliminate funding for these two instruments from NASA's budget.

President's FY 2018 NOAA Budget Request:

- The President requested that funding for NOAA's involvement with the DSCOVR mission be eliminated.

Space Weather Follow-On

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
Space Weather Follow-on	1.198	0.500
Total	**1.198**	**0.500**

Mission

The Space Weather Follow-on will "investigate both commercial and government options to ensure continuity of critical space weather observations through the year 2032." The lack of a Deep Space Climate Observatory (DSCOVR) replacement will diminish NOAA's ability to provide timely and accurate geomagnetic storm warnings and other space weather services, leaving the U.S public infrastructure more vulnerable to impending space weather storms.

President's FY 2018 NOAA Budget Request:

- The President's budget requests $0.500 million, $698 thousand below the FY 2017 enacted budget.

COSMIC-2

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
Satellite and Ground Services	10.081	6.100
Total	**10.081**	**6.100**

Mission

The Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC) activity is a six satellite constellation that was launched in 2006 in a joint collaboration between Taiwan, National Science Foundation, NASA, USAF, and University Corporation for Atmospheric Research (UCAR) as a research effort to explore a new, inexpensive atmospheric sounding technique using the U.S. Global Positioning System (GPS) as a sounding signal source. The results were so positive that NOAA started using this data operationally. COSMIC design life was reached in April 2011, one satellite has failed and 2 satellites are in degraded operation, leaving four of the original six satellites in operation.

COSMIC-2 is a continuation of the partnership between the United States (NOAA and USAF) and Taiwan to produce an operational constellation of 12 identical GNSS RO satellites. The COSMIC-2 constellation is expected to provide 10 times the number of daily soundings that COSMIC currently provides, which would increase the benefits to weather forecasting.

President's FY 2018 NOAA Budget Request:

- The President requested $6.1 million for COSMIC-2, $3.981 million below the FY 2017 enacted budget.

Satellite and Ground Services (SGS)

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
Satellite and Ground Services	53.898	53.000
Total	**53.898**	**53.000**

Mission

The goal of NOAA's Satellite Ground Services (SGS) program is to serve as the single organization for planning and execution of all common ground services for NOAA's satellites. NOAA provides satellite operations, data collection, data processing, distribution, and archiving for multiple satellites and will be adding new satellites (e.g., JPSS and GOES-R) in the future. Many of the existing ground systems (GS), or ground system components, were developed and are operated specifically for each mission or mission set. The GS variations are usually driven by the latest technology available at the time of the GS development rather than differences in mission requirements. As a result of GS technology differences, the staffing for operations and maintenance of each mission is unique, allowing for only very limited cross-staffing and hardware redundancy. To improve efficiency, the SGS is developing a common design and architecture that will be implemented across NOAA and will allow for future cost savings.

President's FY 2018 NOAA Budget Request:

- The President requested $53 million for Satellite and Ground Services, $898 thousand below its FY 2017 enacted budget.

Commercial Weather Data Pilot

Budget Authority, $ in million	FY 2017 Consolidated Appropriations Act (P.L. 115-31)	President's FY 2018 NOAA Budget Request
Commercial Weather Data Pilot	2.994	3.000
Total	**2.994**	**3.000**

Mission

This budget will continue the weather data pilot program NESDIS began in FY 2016. The effort seeks to identify, purchase, and evaluate available commercially available satellite data. While previously focused on radio occultation data, the program will assess new data products including space weather data. This budget will support the program as it continues to test commercial data for accuracy and value, evaluate ground systems and IT infrastructure, and deliver assessments on its findings to NOAA.

President's FY 2018 NOAA Budget Request:

- The President requested $3 million for Satellite and Ground Services, $6 thousand above the FY 2017 enacted budget.
- FY 2018 funding will support the following milestones:
  - Complete assessment of data purchased in FY 2017
  - Conduct market research and award a new contract for an additional data type

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About the Space Foundation

The foremost advocate for all sectors of the space industry and an expert in all aspects of space, the Space Foundation is a global, nonprofit leader in space awareness activities, educational programs that bring space into the classroom and major industry events, including the *Space Symposium*, all in support of its mission "to advance space-related endeavors to inspire, enable and propel humanity." The Space Foundation publishes *The Space Report: The Authoritative Guide to Global Space Activity* and provides three indexes that track daily U.S. stock market performance of the space industry. Through its Space Certification™ and Space Technology Hall of Fame® programs, the Space Foundation recognizes space-based technologies and innovations that have been adapted to improve life on Earth. The Space Foundation was founded in 1983 and is based in Colorado Springs, Colo. Its world headquarters features a public Visitors Center with two main areas - the El Pomar Space Gallery and the Northrop Grumman Science Center featuring Science On a Sphere®. The Space Foundation also conducts research and analysis and government affairs activities from its Washington, D.C., office and has a field office in Houston, Texas. For more information, visit www.SpaceFoundation.org. Follow us on Facebook, LinkedIn and Twitter, and read about the latest space news and Space Foundation activities in *Space Watch*.

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