



## FY 2016 NOAA Satellites Budget Comparison

### Update 3

This document provides an overview of the **President’s FY 2016 NOAA Budget request** in comparison with the **House passed Commerce, Justice, Science Appropriations Bill**, the **Senate Appropriations Committee (SAC) passed Commerce, Justice, Science Appropriations Bill**, and the **FY 2016 Omnibus**.

### NOAA Satellites – FY 2016 Funding

Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President’s FY 2016 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
<b>Satellites</b>					
Geostationary Systems – R Series	980.838	871.791	871.791	871.791	871.791
Altimetry Mission - Jason-3	23.175	7.458	7.458	7.458	7.458
Polar Orbiting Systems - Joint Polar Satellite System (JPSS)	916.267	808.966	808.966	808.966	808.966
Polar Follow-On	0.00	380.00	0.000	135.000	370.0
Solar Irradiance, Data and Rescue (SIDAR)	7.300	0.500	0.000	0.500	0.500
Deep Space Climate Observatory (DSCOVR)	21.100	3.200	3.200	3.200	3.200
Space Weather Follow-On	0.00	2.500	2.500	0.000	1.200
COSMIC-2/Global Navigation Satellite System Radio Occultation (GNSS RO)	6.800	20.000	20.000	10.100	10.100
Satellite Ground Services	50.000	58.525	58.525	50.000	54.000
Systems		4.929	3.000	3.929	



Architecture and Advanced Planning (SAAP)	3.000				3.929
Projects, Planning and Analysis	25.200	30.488	25.200	25.228	25.200
Commercial Weather Data Pilot	0.000	0.000	0.000	0.000	3.000
<b>Total</b>	<b>2,033.68</b>	<b>2,188.357</b>	<b>1,800.64</b>	<b>1,916.172</b>	<b>2,159.344</b>

**President’s FY 2016 Budget Request for NOAA Satellites**

In FY 2016 the President’s budget request included \$2,188.357 million for NOAA satellites, \$154.677 million more than the funds appropriated for NOAA satellites in FY 2015.

**Geostationary Operational Environmental Satellite–R (GOES-R)**

Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President’s FY 2015 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
GOES-R	980.838	871.791	871.791	871.791	871.791
<b>Total</b>	<b>980.838</b>	<b>871.791</b>	<b>871.791</b>	<b>871.791</b>	<b>871.791</b>

**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 and will improve its ground system, which will provide better data products for National Weather Service (NWS) and other NOAA stakeholders.

President’s FY 2016 NOAA Budget Request:

- The President requested \$980 million for GOES-R, \$109.047 million below its FY 2015 enacted budget. \$94 million is a planned program reduction, and “the FY 2016 request is decreased by \$15.0 million achieved by a one week reduction in carryover available to the GOES-R program from FY 2016 to FY 2017.” The reduced carryover amount “does not change the program’s content or life cycle cost.”
- The remaining funds are needed “to maintain instruments, satellite, and ground system developments that are all currently under contract in order to meet the launch commitment dates of the 2nd Quarter FY 2016 for GOES-R and 3rd Quarter FY 2017 for GOES-S.” Additional funds will be used “to continue the development activities for GOES-T and GOES-U to maintain their launch schedules. FY 2016 marks a critical juncture as the program prepares the GOES-R satellite for launch.”
- FY 2016 funding will support:
  - Completion of GOES-R satellite, ground system, and flight-to-ground integration and test activities;
  - Complete GOES-R satellite pre-ship, ship, and launch base activities;



- GOES-R launch service activities, including launch vehicle integration and test, shipment to launch base, and launch base activities;
- Launch of GOES-R;
- Initiation of post launch satellite check-out and calibration activities;
- Completion of fabrication of GOES-S spacecraft hardware and initiation of satellite-level integration;
- GOES-S launch service activities;
- Fabrication, assembly, and integration of GOES T&U instruments and spacecraft hardware

House Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The recommendation includes \$871.791 million to fully fund the GOES–R program at the President’s FY16 request. This amount “supports a planned launch date in the second quarter of fiscal year 2016. NOAA shall continue to provide updates to the Committee regarding the status of this program to include the on-orbit GOES satellites.”

SAC Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The SAC-passed version includes \$871.791 million to fully fund the GOES–R program at the President’s FY16 request and directs NOAA “to prioritize satellite programs directly related to weather forecasting and that result in the greatest reduction of risk to lives and property.”
- This version also states that “keeping JPSS and GOES–R programs on-budget and on-schedule is critical, as is maintaining their respective cost controls, particularly when NOAA’s satellite missions continue to dominate the agency’s annual budget requirements. The Committee reiterates its previous direction to NOAA to find savings from operating expenses and to reduce duplicative Government overhead shared with the National Aeronautics and Space Administration [NASA].”

FY 2016 Omnibus

- The omnibus appropriates \$871.791 million to fully fund the GOES–R program at the President’s FY16 request, and sets the life cycle cost for the program at \$10.828.059 billion.

### Jason-3

Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President’s FY 2016 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
JASON-3	23.175	7.548	7.548	7.548	7.548
<b>Total</b>	<b>23.175</b>	<b>7.548</b>	<b>7.548</b>	<b>7.548</b>	<b>7.548</b>

#### Mission

The [Jason-3](#) satellite is planned as a follow-on for Jason-2. Jason-3 is a joint satellite altimetry mission between NOAA, the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), and the Centre National d’Etudes Spatiales (CNES), the French Space Agency. 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 2016 NOAA Budget Request:

- The President requested \$7.548 million for JASON-3, a planned decrease of \$15.717 million.
- Jason-3 is slated for launch in the second quarter of this year, and “NOAA will support routine post-launch operations of the Jason-3 satellite to include ingestion, processing and distribution of the data, and providing essential engineering services to sustain operations in the event of space or ground based anomalies.” NOAA will additionally “complete the evaluation of the Jason-3 satellite and instrument performance during the calibration and validation of all satellite data and will support continued Jason-3 satellite operations” per an “interagency commitment with EUMETSAT and CNES.”
- The FY 16 President’s Budget Request “supports NOAA’s responsibility to provide post-launch operations for the Jason-3 mission. NOAA will work with NASA, OSTP, and OMB to transition the acquisition, development and sustainment of future space-based ocean altimetry systems to NASA.”
- The President’s proposed Budget also “supports NOAA’s broad environmental mission and redefines NASA and NOAA earth observing responsibilities whereby NOAA will be responsible for satellite missions that directly contribute to NOAA’s ability to issue weather and space weather forecasts and warnings to protect life and property.
- FY 2016 funding will support:
  - Initiation and continuation of routine operations

House Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The recommendation includes \$7.584 million to fully fund the Jason-3 program at the President’s FY16 request.

SAC Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The SAC-passed version includes \$7.584 million to fully fund the Jason-3 program at the President’s FY16 request.

FY 2016 Omnibus

- The omnibus appropriates \$7.548 million to fully fund the Jason-3 program at the President’s FY16 request.

**Joint Polar Satellite System (JPSS)**

Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President’s FY 2016 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
JPSS	916.267	808.966	808.966	808.966	808.966
<b>Total</b>	<b>916.267</b>	<b>808.966</b>	<b>808.966</b>	<b>808.966</b>	<b>808.966</b>

**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 2016 Budget Request:

- The President requested \$808.966 million for JPSS, \$107.301 million below its FY 2015 enacted budget. \$82.3 million is a planned budget reduction, and “the FY 2016 request is decreased by \$25.0 million achieved by a one week reduction in the carryover available to the JPSS program from FY 2016 into FY 2017.” The reduction to carryover “does not change the program’s content and life cycle costs.”
- FY 2016 funding will support:
  - Operating and sustaining the S-NPP satellite which was launched October 28, 2011.
  - Continuing ground system operations for S-NPP under the Block 1.2X until it is retired, completing development and deployment of the new Block 2.0 upgrade, and performing integration testing of the Block 2.0 with the JPSS-1 flight segment to get ready for JPSS- 1 launch
  - Completing testing the JPSS-1 integrated spacecraft, preparing for JPSS-1 launch site integration and testing (I&T)
  - Continuing with preparation for launch vehicle and services for JPSS-1 for launch by no later than 2nd quarter of FY 2017
  - Continuing the development of JPSS-2 spacecraft and instruments
  - Supporting capability to launch JPSS-2 targeted by 4th quarter FY 2021

House Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The recommendation includes \$808.966 million to fully fund the JPSS program at the President’s FY16 request.
- The committee believes that “this level of funding will support the continuing development of instruments, ground systems and spacecraft associated with the planned launch of JPSS–1 no later than the second quarter of fiscal year 2017.”
- The Committee expresses concern about “the continuous delays in producing a critical sensor for JPSS–1, the Advanced Technology Microwave Sounder, and expects to be kept informed of this issue. JPSS gap mitigation.”
- In addition, “the Committee remains concerned about the potential polar satellite data gap and expects NOAA to continue to prepare for the potential data gap. The Committee expects NOAA to investigate ways to prioritize mitigation projects with the greatest potential benefit to weather forecasting and to ensure that all relevant entities follow the reporting requirements identified in NOAA’s Contingency Plan. NOAA shall keep the Committee informed regarding development, integration, and testing of JPSS 1 and preparation for a potential data gap.”

SAC Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The SAC-passed version includes \$808.966 million to fully fund the JPSS program at the President’s FY16 request.
- The committee report also says that “NOAA is directed to prioritize satellite programs directly related to weather forecasting and that result in the greatest reduction of risk to lives and property.” It further states that keeping JPSS on-budget and on-schedule is “critical.”

FY 2016 Omnibus

- The omnibus appropriates \$808.966 million to fully fund the JPSS program at the President’s FY16 request, and sets the life cycle cost for the program at \$11.322.125 billion.

## Polar Follow-On



Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President's FY 2016 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
Space Weather Follow-on	0.00	380.00	0.00	135.0	370.0
<b>Total</b>	<b>0.00</b>	<b>380.00</b>	<b>0.00</b>	<b>135.0</b>	<b>370.0</b>

### 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 2016 NOAA Budget Request:

- The President's budget requests \$380 million "to initiate PFO."
- The President's FY16 request "also invests in an Earth Observing Nanosatellite-Microwave (EON-MW), which is a miniature microwave sounder that approximates the atmospheric profiling capabilities of the Advanced Technology Microwave Sounder (ATMS) instrument, and provides some mitigation in the event of a launch or instrument failure on JPSS-1."

#### House Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The House-passed version of the bill doesn't include any funding for the Polar follow-on program, "which the Administration proposed and an independent senior review team recommended as a way to help build backup redundancy into the polar-orbiting weather satellite system."

#### SAC Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The SAC recommendation includes \$135 million for the Polar follow-on program, \$245 million below the President's FY16 request.
- The committee report states that "ensuring a risk-averse and robust continuation of polar orbiting weather satellites is essential to avoid gaps in the data that is required for accurate weather forecasting" and "directs NOAA to have an Independent Cost Estimate [ICE] conducted for the Polar Follow-on program." Specifically, within 180 days of enactment of this act, "NOAA shall provide detailed results from the ICE analysis to the Committee, including a comparison to the agency's internal estimate of the program's life-cycle cost."

#### FY 2016 Omnibus

- The omnibus appropriates \$370 million for the Polar Follow-on program, \$10 million less than the President's FY16 request.



- The act does not include funding for the proposed and experimental Earth Observing Nanosatellite-Microwave component. The act proscribes that “NOAA’s mission for polar orbiting weather satellites continues on a tenuous path. NOAA shall focus on procuring the next series of satellites for the JPSS constellation, using proven sensors and platforms, to achieve the program’s budgetary estimates and launch schedule.”

## Solar Irradiance, Data and Rescue (SIDAR)

Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President’s FY 2016 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
Solar Irradiance, Data and Rescue (SIDAR)	7.300	0.500	0.000	0.500	0.500
<b>Total</b>	<b>7.300</b>	<b>0.500</b>	<b>0.000</b>	<b>0.500</b>	<b>0.500</b>

### Mission

This request will develop and initiate an acquisition strategy to fly the Total Solar Irradiance Sensor (TSIS) instrument. TSIS was built by the Laboratory for Atmospheric and Space Physics at the University of Colorado at Boulder and consists of a suite of two instruments, the Total Irradiance Monitor (TIM) and the Spectral Irradiance Monitor (SIM). TIM is an active radiometer that monitors changes in Total Solar Irradiance at the top of the Earth’s atmosphere. SIM is a prism spectrometer that monitors changes in Solar Spectral Irradiance as a function of wavelength.

As part of the SIDAR project, NOAA intends to continue an 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 2016 Budget Request:

- The President requested \$500 thousand for SIDAR, \$6.8 million below the FY 2015 enacted budget.
- NOAA requested this significant decrease “to plan for the accommodation of the Argos Advanced Data Collection System (A-DCS) and Search and Rescue Satellite Aided Tracking (SARSAT) instruments.” Both are slated for launch in 2019.
- Additionally, “the Total Solar Irradiance Spectrometer (TSIS) instrument was developed by NOAA and transitioned to NASA in FY 2015.” It will be launched and operated by NASA next year.
- NOAA “will continue to operate the Total Solar Irradiance Calibration Transfer Experiment (TCTE) instrument to provide the bridge between the Solar Radiation and Climate Experiment (SORCE) and TCTE. In FY 2016 and beyond, the SIDAR program will consist of A-DCS and SARSAT.”

### House Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The House-passed version of the bill doesn’t include any funding for the SIDAR program.

### SAC Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)



- The SAC recommendation includes \$0.500 million to fully fund SIDAR at the President’s FY16 request.

FY 2016 Omnibus

- The omnibus appropriates \$0.500 million to fully fund SIDAR at the President’s FY16 request.

## Deep Space Climate Observatory (DSCOVR)

Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President’s FY 2016 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
DSCOVR	21.100	3.200	3.200	3.200	3.200
<b>Total</b>	<b>21.100</b>	<b>3.200</b>	<b>3.200</b>	<b>3.200</b>	<b>3.200</b>

### Mission

The maintenance and operations of NASA’s [Deep Space Climate Observatory \(DSCOVR\)](#) satellite will allow continuity of solar wind data used for geomagnetic storm warnings. NOAA will operate and manage 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 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 will be 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 will be 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 will also carry two earth remote sensing instruments provided by NASA. The Earth Polychromatic Camera (EPIC) that will take continuous full disk images of Earth and the NIST Advanced Radiometer (NISTAR) that will take continuous full disk measurements of the earth’s radiation balance. NOAA will provide the level 0 data stream to NASA, and NASA will provide data processing and all higher level data products.

President’s FY 2016 NOAA Budget Request:

- The President requested \$3.2 million for DSCOVR in FY 2016, \$17.9 million below its FY 2015 enacted budget.
- FY 2016 funding will support:
  - Continued support for “routine post- launch maintenance and operations for the DSCOVR mission.”
  - Sustained “engineering support for the Mission Operations Center (MOC) located at the NOAA Satellite Operations Facility (NSOF) in Suitland, MD.” In addition, “NOAA will provide mission operations, ground systems maintenance, data processing and archiving,” as well as “on-orbit support and enhancements to the ground system.”

House Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)





- The House-passed version of the bill includes \$3.200 million to fully fund DSCOVR at the President’s FY16 request.

SAC Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The SAC recommendation includes \$3.200 million to fully fund DSCOVR at the President’s FY16 request.

FY 2016 Omnibus

- The omnibus appropriates \$3.200 million to fully fund DSCOVR at the President’s FY16 request.

## Space Weather Follow-On

Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President’s FY 2016 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
Space Weather Follow-on	0.00	2.500	2.500	0.00	1.200
<b>Total</b>	<b>0.00</b>	<b>2.500</b>	<b>2.500</b>	<b>0.00</b>	<b>1.200</b>

### Mission

NOAA requests an increase of \$2.5 million to analyze options from the Analysis of Alternatives (AoA) for critical space weather observations and to initiate development of the Space Weather Follow On program. The mission design life for the DSCOVR spacecraft ends in FY 2019. Thus, NOAA will initiate plans and studies in FY 2016 to ensure data continuity for solar wind data. The lack of a 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 2016 NOAA Budget Request:

- The President’s budget requests \$2.500 million “to plan and initiate development of the Space Weather Follow On program.”

House Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The House-passed version of the bill includes \$2.500 million to fully fund the Space Weather Follow-on program at the President’s FY16 request.

SAC Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The SAC recommendation does not include any allocations for the Space Weather Follow-on program.
- The Committee “acknowledges the need to continue collecting space weather data in order to forecast and mitigate damage from solar geomagnetic storms” and states that “a coherent space weather architecture is necessary to predict and mitigate damage from threats to communications and electrical infrastructure.”
- The Committee points out “that the Administration’s request designates NOAA as the agency responsible for procuring and issuing alerts based on such data. While NASA’s heliophysics program has historically provided data in this domain, NASA’s program is designed for research rather than operational requirements and has limited ability to forecast space weather events.”
- Accordingly, within 120 days enactment of this act, “NOAA is directed to submit a report to the Committee detailing: space weather data needs for operational forecasting, various options for attaining such data, cost estimates for those options, and corresponding timelines. The report shall also analyze the potential impact of a space weather data gap after 2019.”



## FY 2016 Omnibus

- The omnibus appropriates \$1.200 million for the Space Weather Follow-On program, \$1.300 million below the President’s FY16 request. The amount is “for the activities identified in the Senate report and non-Federal awards for a study or studies to evaluate low-cost alternatives for a space weather constellation to support operational forecasting needs. The study or studies shall examine the feasibility of improving forecast warning times and geographic precision in those forecasts.”
- The omnibus also adopts Senate language regarding a report on initial findings, which shall be submitted to the Committees within one year after enactment of the Act. This report “shall include an inventory of all existing and planned space weather assets held by NOAA and NOAA’s partners, to include each asset’s function, operation and maintenance expenses, and lifetime cost estimates, and shall identify any potential gaps in data needed for space weather forecasting.”

## **COSMIC 2**

<b>Budget Authority, \$ in million</b>	<b>Consolidated Approps, 2015 (P.L. 112-235)</b>	<b>President’s FY 2016 NOAA Budget Request</b>	<b>House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)</b>	<b>Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill</b>	<b>FY 2016 Omnibus</b>
Satellite and Ground Services	6.800	20.000	20.000	10.100	10.100
<b>Total</b>	<b>6.800</b>	<b>20.000</b>	<b>20.000</b>	<b>10.100</b>	<b>10.100</b>

### **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 2016 NOAA Budget Request:

- The President requested \$20 million for COSMIC 2, \$13.2 million above its FY 2015 enacted budget.
- FY 2016 funding will support:
  - Completion of “all IT security testing and verification in preparation of the Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC-2) launches”



- Testing and certification by National Centers for Environmental Prediction (NCEP) of “all University Corporation for Atmospheric Research (UCAR) processing functions” in advance of the FY 2016 and FY 2019 launches
- “Complete operational testing and validation of the Numerical Weather Prediction Models (NWP) for COSMIC-2. This testing requires 8–12 months of joint operations between NCEP and UCAR before the system can be deemed operational at NWS in support of the first COSMIC-2 launch”
- Procurement of a set of six radio occultation (RO) sensors, which are “critical to help mitigate the impacts of a potential loss of sounders in that orbit”

House Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The House-passed version of the bill includes \$20 million to fully fund COSMIC 2 at the President’s FY16 request.
- The committee report states that this money should be used “to support ground processing activities and procurement of the next set of six COSMIC–2 Radio Occultation sensors, now planned for launch in fiscal year 2019” and states that “the current COSMIC constellation reached the end of its expected design life in 2011; only four of those six satellites are in operation. Data from the COSMIC program is used in numerical weather forecasting and serves as a calibration tool for other NOAA weather observations.”
- The Committee chastises NOAA, stating that it “still has not seen a comprehensive plan for the next segment of the COSMIC–2 Mission, the launch of six additional COSMIC satellites, despite having required this plan last year in report language.” The committee directs that “NOAA shall submit this plan no later than 30 days after enactment of this Act, to include expected outyear costs by agency and outside partners, with appropriate milestones and deliverables. This plan also shall explain why the launch of the next segment of COSMIC–2 sensors has been delayed to fiscal year 2019. NOAA also shall include in this report an analysis for acquiring radio occultation weather data from private sector providers. NOAA shall include within this plan the results of its observing system simulation experiment or other data denial studies conducted to determine the value of data from both global positioning system radio occultation and a geostationary hyperspectral sounder global constellation.”
- Finally, “the Committee underscores the value of COSMIC data as a potential gap filler for the fragile JPSS program and therefore directs NOAA to provide the analysis requested above within the prescribed timeframe”

SAC Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The SAC recommendation includes \$10.1 million for the COSMIC 2 program, \$9.9 million below the President’s FY16 request “for the ground reception and processing of Global Navigation Satellite System Radio Occultation [GNSS RO] satellite data, which will augment current data used for global weather forecasts and studies.”
- The difference in funding is due to the fact that “no funding is provided for the procurement of a second set of radio occultation [RO] sensors that NOAA proposes to launch into polar orbit in 2019. The Committee notes that the U.S. Air Force—NOAA’s partner on COSMIC–2—has not committed to providing launch services for a polar constellation of RO sensors. Furthermore, NOAA has not yet identified any other launch provider for this proposed polar constellation. The Committee encourages NOAA to explore all options for obtaining polar GNSS RO data, including through commercial data purchases.”

FY 2016 Omnibus

- The omnibus appropriates \$10.100 million for the Space Weather Follow-On program, \$9.900 million below the President’s FY16 request.



## Satellite Ground Services (SGS)

Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President's FY 2016 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
Satellite Ground Services	50.000	58.525	58.525	50.000	54.000
<b>Total</b>	<b>50.000</b>	<b>58.525</b>	<b>58.525</b>	<b>50.000</b>	<b>54.000</b>

### 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, GOES-R, DSCOVR, Jason-3) 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 2016 NOAA Budget Request:

- The President requested \$58.525 million for Satellite Ground Services, \$8.525 million above its FY 2015 enacted budget.
- FY 2016 funding will support:
  - Continued implementation of capabilities to process satellite observations into useful products that meet the requirements of NOAA's operational centers and other external users;
  - Sustaining current and legacy ground systems in use at NESDIS facilities, including GOES and POES capabilities;
  - Continued development of the NPOESS Data Exploitation (NDE) capability, started in 2011, that produces products from the Suomi National Polar-orbiting Partnership (SNPP) satellite;
  - Building a foundation for sustaining upcoming satellite systems in NOAA, including the Joint Polar Satellite System (JPSS) satellites and the Geostationary Operational Environmental Satellite R-Series Program (GOES-R); and
  - Planning the transition of the next generation of polar and geostationary satellite programs into the common ground services

#### House Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)

- The House-passed version of the bill includes \$58.525 million to fully fund Satellite Ground Services at the President's FY16 request "and includes \$2.717 million to continue development of an enterprise ground system."
- The report directs that "NOAA shall provide a report to the Committee no later than 60 days after enactment of this Act regarding research and investments undertaken during fiscal year 2014 and 2015 and plans for 2016 on a common ground system and integrated architecture."

#### SAC Passed Commerce, Justice, Science Appropriations Bill (H.R. 2578)



- The SAC recommendation includes \$50 million for Satellite Ground Services, \$8.525 million below the President’s FY16 request.

FY 2016 Omnibus

- The omnibus appropriates \$54 million for Satellite Ground Services, \$4.525 million below the President’s FY16 request.

**Commercial Weather Data Pilot**

Budget Authority, \$ in million	Consolidated Approps, 2015 (P.L. 112-235)	President’s FY 2016 NOAA Budget Request	House Passed Commerce, Justice, Science Approps Bill (H.R. 2578)	Senate Approps Committee (SAC) Passed Commerce, Justice, Science Approps Bill	FY 2016 Omnibus
Commercial Weather Data Pilot	0.000	0.000	0.000	0.000	3.000
<b>Total</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>3.000</b>

FY 2016 Omnibus

- The omnibus appropriates \$3 million for a commercial weather data pilot program. The bill directs that “NOAA shall, through an open competitive process, seek to enter into at least one pilot contract to assess the potential viability of commercial weather data in its weather modeling and forecasting” and that “this funding shall be used to purchase, evaluate, and calibrate available data, which meets the standards and specifications set by NOAA in its Commercial Data Policy.”
- NOAA is also required to provide the Committees a report on how it plans to implement the commercial weather data pilot program not later than 60 days after the enactment of this Act.

**About the Space Foundation**

Founded in 1983, the Space Foundation is the foremost advocate for all sectors of space, and is a global, nonprofit leader in space awareness activities, educational programs and major industry events, including the annual [Space Symposium](#), in support of its mission "to advance space-related endeavors to inspire, enable and propel humanity." Space Foundation World Headquarters in Colorado Springs, Colo., USA, has a public [Discovery Center](#), including El Pomar Space Gallery, Northrop Grumman Science Center featuring Science On a Sphere® and the Lockheed Martin Space Education Center. The Space Foundation has a field office in Houston and conducts government affairs from its Washington, D.C., office. It annually publishes [The Space Report: The Authoritative Guide to Global Space Activity](#), and through its [Space Certification™](#) and [Space Technology Hall of Fame®](#) programs, recognizes space-based innovations that have been adapted to improve life on Earth. Visit [www.SpaceFoundation.org](http://www.SpaceFoundation.org), follow us on [Facebook](#), [Instagram](#), [LinkedIn](#), [Pinterest](#), [Twitter](#) and [YouTube](#), and read our e-newsletter [Space Watch](#).

