



GOES-R

GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE R-SERIES

QUARTERLY NEWSLETTER ■ OCTOBER-DECEMBER 2016 ■ ISSUE 16

A Note from Greg Mandt, GOES-R System Program Director



We did it! After years of research, development and integration, GOES-R (now GOES-16) successfully

launched, made it to geostationary orbit, and is sending back data! It wouldn't have been possible without the dedication, hard work and expertise of each and every member of the GOES-R team. I am so proud of our accomplishments to date and I thank you for all of your efforts to make the launch successful. We have more work to do to get the remaining satellites in the series into space and I am confident those launches will be just as successful. I am leaving management of the program in the capable hands of Mike Stringer, who will be acting as GOES-R Series System Program Director, while I am detailed to lead the Joint Polar Satellite System program for NOAA. Tim Walsh will step in as acting Assistant System Program Director. It has been a pleasure working on the GOES-R Series Program for the past nine years. I wish all of you the best.



GOES-R launched at 6:42 p.m. EST on November 19 from Space Launch Complex 41 at Cape Canaveral Air Force Station, Florida, aboard an Atlas V 541 rocket.



The satellite [separated from the launch vehicle](#) at approximately 10:15 p.m. that evening. GOES-R entered geostationary orbit at 22,240 miles above Earth on November 29 at which time [it became GOES-16](#). Additional photos and videos of the [road to launch](#) and the [launch](#) itself are available on the GOES-R Series website.

DID YOU KNOW?

The GOES-R ground computing system has four petabytes of storage capacity — that's 250,000 16 gigabyte smartphones!

HIGHLIGHTS



A sampling of GOES-R launch media headlines.

The GOES-R launch received a lot of attention from the media and the public. In the days after launch, a Google search for “GOES-R” turned up nearly 250,000 stories and the launch was positioned at the top of the Twitter “Moments” section of highest-trending stories. The launch was also the top post on the space sub-Reddit on November 22. The GOES-R website experienced record traffic November 19-20 with more than one million hits each day. The NOAA Satellites Twitter account gained 25,723 followers over the period of November 5-26, with launch-related tweets earning 4.6 million impressions from November 13 to November 20. The liftoff video was the most viewed, liked and shared post in the history of the NOAA Satellites Facebook page.

On November 30, the GOES-16 solar array fully deployed, releasing the solar array yoke and solar-pointing platform. After a series of maneuvers, GOES-16 placed itself in its designated 89.5 degrees west longitude on December 6. Here it will undergo an extended checkout and validation phase of approximately one year. On December 7, the Magnetometer boom was deployed and its sensors powered on. The Advanced Baseline Imager (ABI), Extreme Ultraviolet and X-ray Irradiance Sensors (EXIS), Geostationary Lightning Mapper (GLM) and Solar

Ultraviolet Imager (SUVI) instruments were powered up on December 9.

2016 closed with a healthy satellite, healthy ground system, and two instruments generating product data. The ground system is supporting all spacecraft and activation needs, including processing and distributing operational science data for EXIS and SUVI. Testing of the GOES Rebroadcast (GRB) downlink is underway and internal direct broadcast users received their first GRB signals.



The GOES-R Safety and Mission Success Review (SMSR) was successfully completed on October 3 at NASA Headquarters. The SMSR confirmed all required safety and mission assurance activities and processes were performed, the baseline requirements were met, and that the program/project had not exceeded the acceptable risk envelope.

The GOES-R L-30 press briefing was held October 4 at the American Association for the Advancement of Science, Washington, D.C. Panelists included NOAA, NASA and GOES-R Series Program management. Also on October 4, the Department of Commerce Headquarters in Washington, D.C., hosted a satellite media tour. Featured speaker Laura Furgione, Deputy Assistant Administration for the National Weather Service, discussed the improvements GOES-R will provide for severe weather forecasts, including hurricanes, lightning detection and more with broadcast meteorologists around the country.

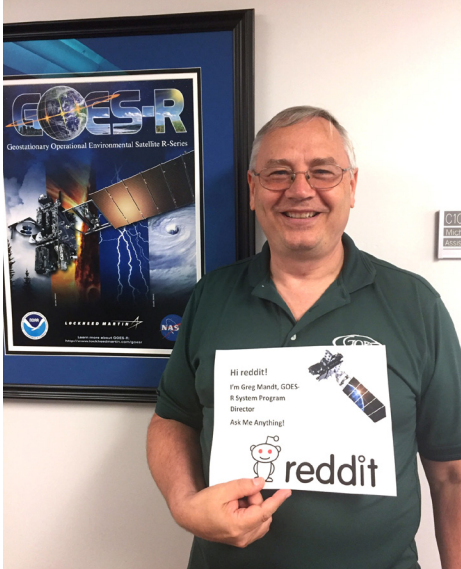


Dr. Louis Uccellini, Assistant Administrator, NOAA's National Weather Service, speaks at the GOES-R press conference on October 4. Credit: NOAA/NASA

ROAD TO LAUNCH (CONTINUED)

On October 6, GOES-R System Program Director Greg Mandt and Senior Scientist Steve Goodman participated in a Reddit “Ask Me Anything” (AMA), “[Launching NOAA’s Revolutionary GOES-R Satellite.](#)”

They answered questions about the GOES-R satellite, its advanced instruments, the upcoming launch, and the science behind the mission.



GOES-R System Program Director Greg Mandt advertises the October 6 Reddit AMA. Credit: GOES-R Series Program

GOES-R launch site preparations shut down on October 5, in preparation for Hurricane Matthew, which passed by the Florida coast on October 7. Matthew damaged facilities and equipment at Kennedy Space Center and Astrotech Space Operations, where GOES-R was undergoing preparations for launch. GOES-R was placed in a protective enclosure and made it through the storm unharmed, though delivery of the launch vehicle Atlas booster was postponed. Some ground support equipment was damaged and the GOES-R launch date of November 4 was changed due to impacts from the hurricane. The launch was further delayed in early November due to a minor Atlas V booster issue. All issues were resolved and a new launch date of November 19 was set.



Team members with United Launch Alliance prepare GOES-R for encapsulation in the payload fairing. Credit: NASA/Kim Shiflett



The Atlas V first stage for GOES-R is lifted to the vertical position at the integration facility at Space Launch Complex 41. Credit: NASA/Kim Shiflett

GOES-R was encapsulated in the payload fairing of the launch vehicle on October 21. The payload fairing protects the spacecraft during the ascent through Earth’s atmosphere. On October 24, the Atlas V first stage was placed on the stand in the Vertical Integration Facility at Space Launch Complex 41 at Cape Canaveral Air Force Station. The first stage of the Atlas V rocket holds the fuel and oxygen tanks that feed the engine for ascent and powers the spacecraft into orbit.



A crane lifts the GOES-R payload fairing for mating to the Atlas V centaur upper stage on November 9. Credit: NASA/Ben Smegelsky

ROAD TO LAUNCH (CONTINUED)

GOES-R completed a series of reviews and rehearsals in the final month before launch. On October 21, the NOAA Deputy Under Secretary of Operations concurred with the **Key Decision Point E (KDP-E)** recommendation to proceed to launch. This decision point confirmed that the end-to-end GOES-R system was fully integrated, the Mission Readiness Review was successfully completed, and the program was prepared for the Flight Readiness and Launch Readiness Reviews. The **Spacecraft Mate Readiness Review** was successfully completed on November 7. This review went over the procedures and roles and responsibilities for getting the spacecraft on top of the launch vehicle, which was successfully accomplished on November 9. The **Mission Dress Rehearsal**, a dry run for launch, was held on November 14, allowing the launch team to simulate launch procedures and activities. On November 15, the **Flight Readiness Review** certified the readiness to proceed with initiation of the final launch preparation activities. The final pre-launch review, the **Launch Readiness Review**, was completed on November 17, authorizing approval to proceed to the launch countdown.



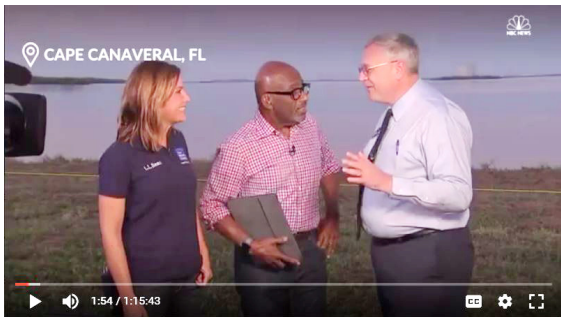
Rollout of GOES-R to the launch pad on November 18. Credit: NASA/Ben Smegelsky

On November 18, the United Launch Atlas V rocket and its GOES-R payload were moved from Kennedy Space Center's Space Launch Complex 41 Vertical Integration Facility to the launch pad in preparation for the November 19 launch. The Atlas V was in its 541 configuration, which means it has the five-meter-diameter payload fairing, four solid-fueled boosters and the Centaur upper stage is equipped with a single engine.



GOES-R on the launch pad after rollout on November 18. Credit: NOAA/NASA

GOES-R LAUNCH WEEK EVENTS



GOES-R System Program Director Greg Mandt speaks to The Weather Channel's Jen Carfagno and NBC's Al Roker during a live broadcast just prior to the GOES-R launch. Credit: NBC

Nearly thirty broadcast meteorologists gathered at Kennedy Space Center for a GOES-R launch workshop held November 16-19. The workshop brought together broadcast meteorologists from around the nation to engage with professionals from NOAA and NASA on the launch of GOES-R. The workshop produced more than 70 live reports covering the launch, resulting in a total national audience of four million people. In addition, NBC meteorologist Al Roker attended the launch and participated in a [live broadcast](#) during the launch window with workshop participant Jen Carfagno of The Weather Channel.

GOES-R LAUNCH WEEK EVENTS (CONTINUED)



GOES-R L-2 press conference panelists. Credit: NASA/Kim Shiflett

The GOES-R pre-launch press conference was conducted at the Kennedy Space Center press site on November 17. The press conference included briefings on the GOES-R mission and launch readiness and included panelists from NOAA, NASA, United Launch Alliance, the National Weather Service, and the U.S. Air Force.

Twenty-three grade 6-12 STEM (Science, Technology, Engineering, and Mathematics) teachers from the U.S. and Puerto Rico attended a GOES-R launch workshop for educators on November 18. The workshop gave the educators an opportunity to learn about GOES-R educational resources, lesson plans, and classroom activities and experience the launch live.



GOES-R science workshop participants. Credit: GOES-R Series Program

The GOES-R science team attended a workshop at Kennedy Space Center on November 18 which provided an overview and status update on GOES-R science activities for post-launch readiness. This includes product readiness and operations, user readiness and forecaster training, risk reduction, and post-launch test readiness.

The GOES-R Launch Social was held November 18-19 at Kennedy Space Center. Fifty social media users were provided the opportunity to snap, post, tweet, and share everything about the launch of GOES-R. Social media credentials gave users the same access as journalists in an effort to align the experience of social media representatives with those of traditional media.

GOES-S, T, U PROGRESS

The GOES-S satellite is now fully integrated and undergoing **environmental testing**. GOES-S has completed acoustics and vibration tests and is now preparing for thermal vacuum testing. The environmental assessments, which are conducted at Lockheed Martin Corporation's Littleton, Colorado, facility, subject the satellite to conditions which simulate launch and the harsh space environment. The full set of environmental, mechanical and electromagnetic testing will take about one year to complete.



Engineers prepare GOES-S for acoustics testing in November. Credit: Lockheed Martin

Development of GOES-T and GOES-U is also progressing.

Lockheed Martin began assembly of the GOES-T system module structure and completed the Manufacturing Readiness Review for core integration. 393 out of 420 sub-contracted components for GOES-T have been delivered. For GOES-U, 170 of 420 components have been delivered.

Upcoming Events

First Public ABI and EXIS Imagery
January 2017

First Public SUVI Imagery
February 2017

GOES-16 Validation Field Campaign
March-May 2017

CONNECT WITH US!

