



GOES-R

GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE R-SERIES

QUARTERLY NEWSLETTER ■ JANUARY–MARCH 2019 ■ ISSUE 25

A Note from Pam Sullivan, GOES-R System Program Director:

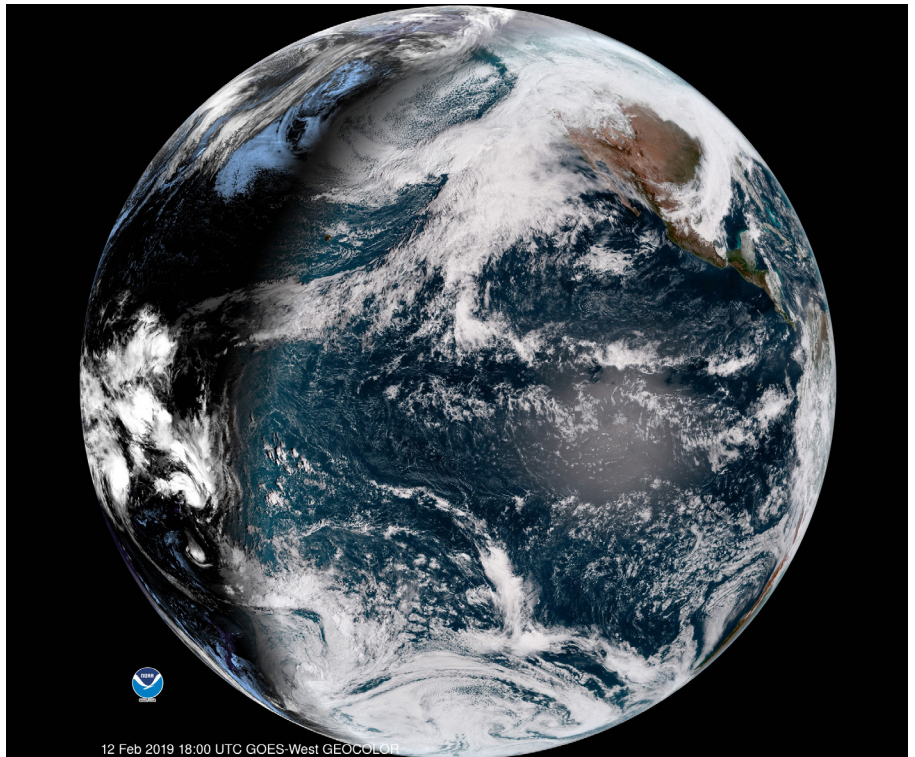


GOES-17 is now operational as GOES West! On February 12, GOES-17 joined GOES-16 in operational service, making

the advanced capabilities of this series available from sea to shining sea! Together, NOAA's most advanced weather satellites provide unprecedented data to forecasters and help save lives and property across more than half the globe. This is a remarkable achievement, made possible by the hard work and dedication of the entire GOES-R team. We remain as busy as ever, with our team continuing to work on GOES-16 and 17 data product validation, the ground system server refresh, the GOES-T/U Advanced Baseline Imager cooling system redesign, and the build of our next two satellites in order to ensure continuity of GOES-R Series operations for many years to come.

PROGRAM HIGHLIGHTS

GOES-17 is now operational as NOAA's GOES West. In its new role, GOES-17 is providing faster, more accurate, and more detailed observations [for detecting and monitoring Pacific storm systems, fog, wildfires, and other weather phenomena that affect the western United States, Alaska, and Hawaii.](#) Located at 137.2 degrees west longitude, GOES-17 replaces GOES-15 as the operational GOES West satellite. GOES-17 joins GOES-16, in operation as NOAA's GOES East, in delivering high-resolution visible and infrared imagery and lightning observations of more than half the globe – from the west coast of Africa to New Zealand and from near the Arctic Circle to the Antarctic Circle. [View GOES-17 operational imagery.](#)



12 Feb 2019 18:00 UTC GOES-West GEOCOLOR
GOES-17 full disk GeoColor imagery from 1:00 p.m. EST on February 12, when the satellite was officially declared operational. Credit: NOAA/STAR

DID YOU KNOW?

Only one known hurricane has ever been recorded in the South Atlantic. Hurricane Catarina made landfall over the state of Santa Catarina, Brazil, as a Category 1 storm on March 27, 2004. [GOES East captured a rare tropical storm, Iba, off the southeast coast of Brazil on March 24, 2019.](#)

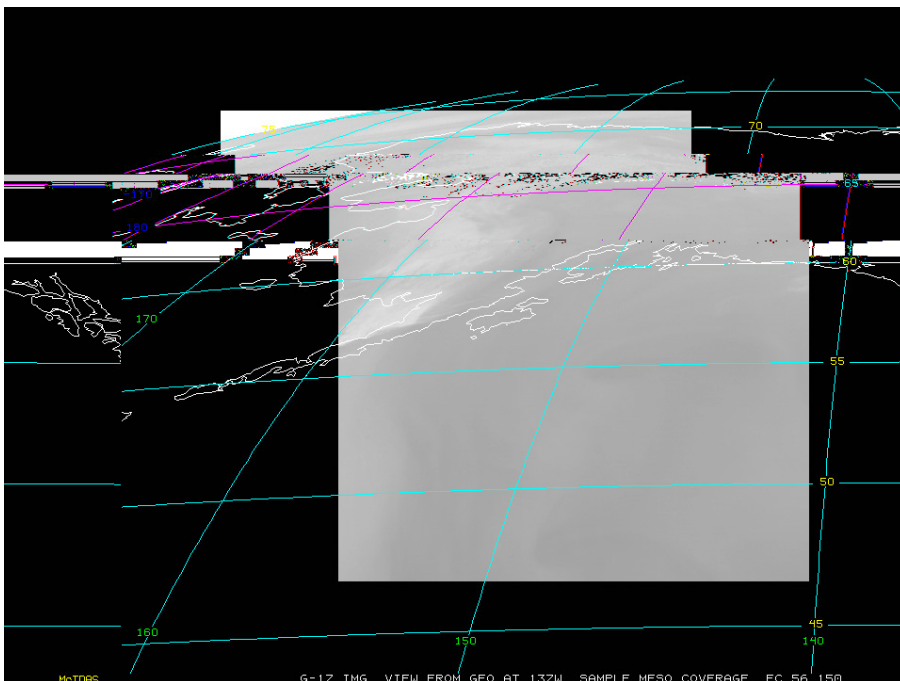
PROGRAM HIGHLIGHTS (CONTINUED)

Due to the [GOES-17 Advanced Baseline Imager \(ABI\) cooling system anomaly](#), GOES-15 will remain on alongside GOES-17 through early July to allow for assessment of the performance of GOES-17 as the GOES West operational satellite. Despite the cooling system issue, GOES-17 is currently delivering more than 97% of the data it was intended to provide and is observing with more channels, at a higher resolution, and with more rapid refresh than what is available from GOES-15.

The GOES-T and GOES-U ABI radiator/loop heat pipe (LHP) redesign is underway. The delta Critical Design Review was held February 7-8 and on March 4, the Manufacturing Readiness Review was successfully

completed. The Design Modification Review was held on March 6 and the team is proceeding with the redesigned radiator assembly build.

Several GOES-16 and GOES-17 science products achieved provisional validation this quarter. The GOES-17 Space Environment In-Situ Suite (SEISS) Solar and Galactic Protons Peer Stakeholder-Product Validation Review (PS-PVR) was held February 27 and the GOES-17 Magnetometer review was completed March 14. On March 27, the GOES-16 SEISS Magnetospheric Particle Sensor – Low Energy Range PS-PVR was held. These products are now provisionally mature, ready for operational use but not yet fully validated.



Default location for GOES-17 MDS 2 as of March 5. Credit: CIMSS

The default location of the GOES-17 ABI mesoscale domain sector (MDS) 2 moved to its new position over Alaska on March 5. Previously located over the southwestern U.S., the default location for MDS 2 was moved to better serve the Alaska region of the National Weather Service (NWS). [Due to the NWS Alaska Region geographic position and limited observational tools, a one-minute MDS provides enhanced capabilities for forecasters.](#) GOES-17 provides two mesoscale scans of targeted areas (1000 x 1000 km) every 60 seconds. These mesoscale domain sectors can be moved to cover targeted areas of severe weather or to fulfill research requests. Whenever MDS 2 is not needed elsewhere, it will stay over Alaska.

The GOES-U spacecraft will carry an additional space weather instrument, the Naval Research Laboratory's

Compact Coronagraph (CCOR), which recently received funding approval. CCOR will help detect and characterize coronal mass ejections from the sun. A kickoff meeting was held March 14 and the Critical Design Review for the instrument is planned for this summer.

DATA AND IMAGERY

On February 1, at 1:17 p.m. EST, the GOES-16 Geostationary Lightning Mapper (GLM) detected a bright meteor over northwestern Cuba. The meteorite landed near Viñales, Pinar del Río, in western Cuba. While designed for mapping lightning flashes, GLM can observe large meteors anywhere throughout its coverage area. The instrument takes 500 images of Earth every second, allowing it to measure the shape of a meteor "light curve," or the change in brightness of a meteor with time, with millisecond precision.

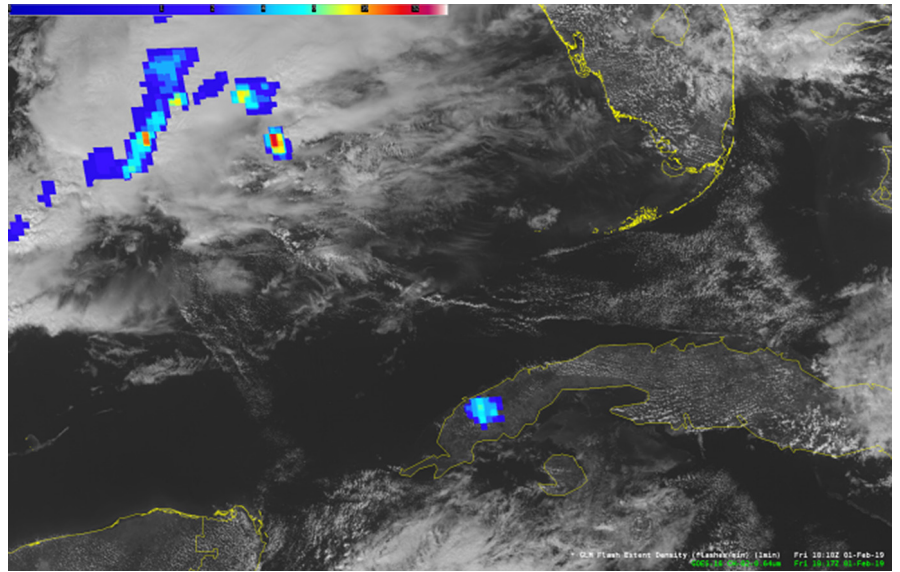
DATA AND IMAGERY (CONTINUED)

The GOES East ABI detected the airborne debris cloud from the meteor as it drifted northeastward then eastward for about an hour after the impact. The signatures in the split cloud top phase and split window imagery were due to the presence of mineral dust particles within the debris cloud — the emissivity properties of dust affects the sensed brightness temperatures differently for various infrared spectral bands. The cirrus spectral band is useful for detecting the scattering of light by airborne particles such as ice crystals, volcanic ash, smoke or dust. The debris cloud was also casting a subtle shadow onto the surface, as seen in visible imagery.

GOES East captured a partial solar eclipse on February 5. In this imagery from the satellite's Solar Ultraviolet Imager (SUVI) instrument, you can see the moon passing across the sun. A partial eclipse occurs when the sun and moon are not exactly in line with the Earth and the moon only partially obscures the sun.

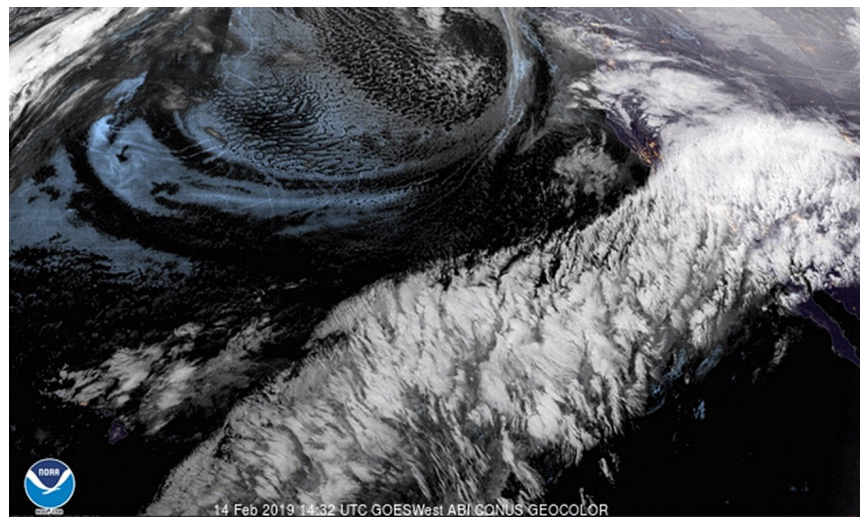


The moon's shadow is seen as it passes in front of the sun on February 5. [View animation of the partial eclipse.](#) Credit: NOAA/NCEI



Meteor over Cuba captured by the GOES-16 GLM on February 1. [View animation of the meteor event.](#) Credit: NASA SPoRT

GOES-17 monitored the large atmospheric river that affected California in mid-February. Atmospheric rivers are long, narrow conveyor belts of moisture that move through the atmosphere. Strong atmospheric rivers can deliver enormous amounts of rain and high-elevation snow in California, the Pacific Northwest, and Alaska, especially during the winter months. Understanding and anticipating the role of atmospheric rivers is important for water and emergency management on the West Coast, particularly in California. [The GOES-R Series ABI provides improved detection and monitoring of atmospheric river events.](#) GOES-17 is positioned to keep an eye on the western U.S. and Pacific Ocean, and provides enhanced monitoring of atmospheric rivers as well as other weather phenomena and hazards.

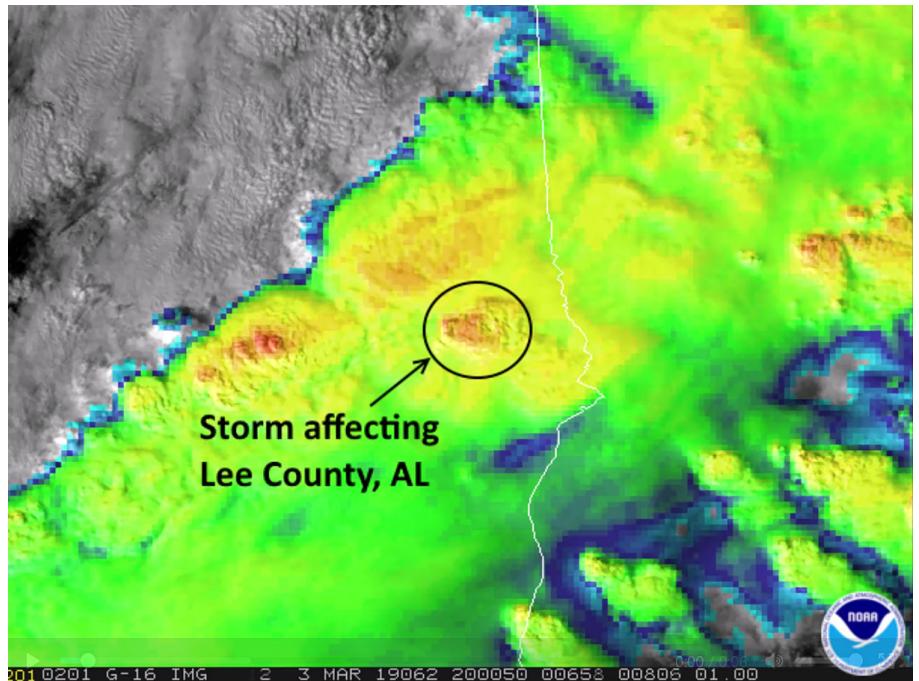


In this GOES-17 GeoColor imagery, an atmospheric river is seen approaching California on February 14. Credit: NOAA

DATA AND IMAGERY (CONTINUED)

A powerful tornado outbreak hit the southern U.S. on March 3, leaving damage across southern Alabama and Georgia, the Florida Panhandle, and parts of South Carolina. [GOES East “sandwich” imagery shows the storm that spawned a deadly F4 tornado in Lee County, Alabama.](#) This kind of imagery is known as a “sandwich” because it combines imagery from visible and infrared bands from the satellite’s ABI. During processing, the transparency of the infrared band is increased and laid on top of the visible band. The result is imagery that offers spectacular views of storm attributes in rich detail. This approach retains both the cloud-top thermal structure as well as the finer visible band details, such as overshooting tops and transverse banding. [Al Roker used this GOES-16 imagery of the storm in a report of the tornado outbreak on MSNBC on March 4.](#)

A well forecast snowstorm struck Colorado on March 13. NWS forecasts mentioned the blizzard and high wind

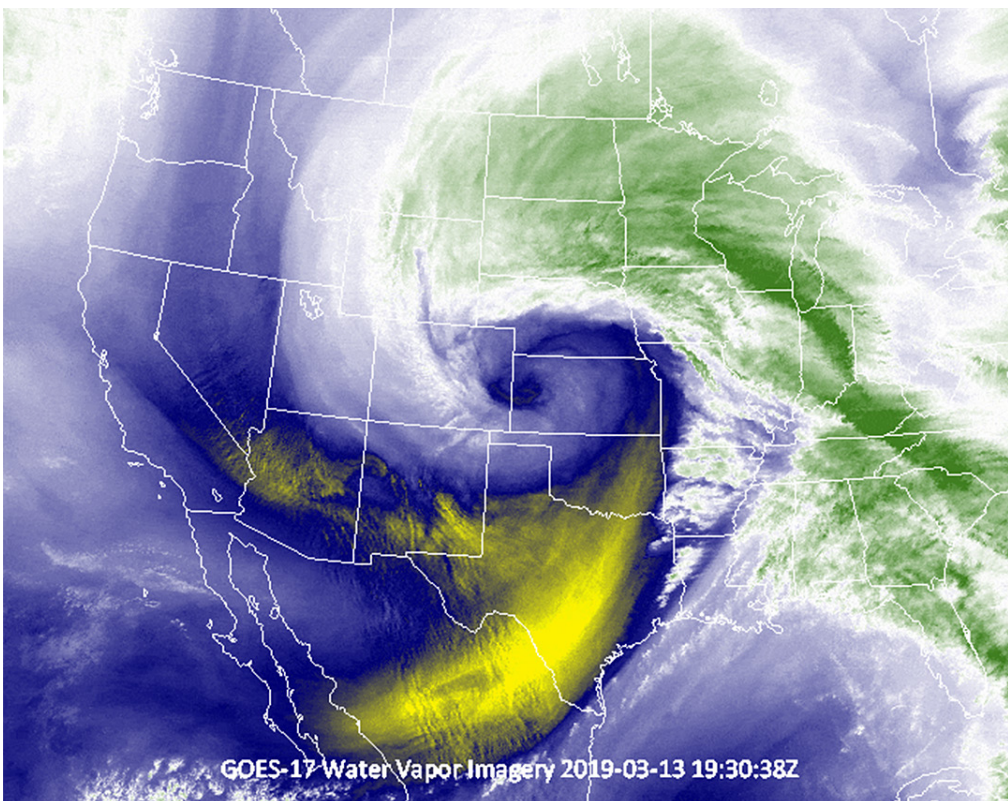


GOES East visible/infrared “sandwich” imagery of the Lee County, Alabama, storm on March 3. Credit: NOAA/CIRA

potential over parts of the eastern Colorado plains days in advance. [GOES West imagery was utilized by forecasters to track the relevant features leading up to the event,](#) and assess model analyses and forecasts. As forecast, the storm caused widespread blizzard conditions from Colorado Springs north, strong winds elsewhere across the eastern Colorado plains,

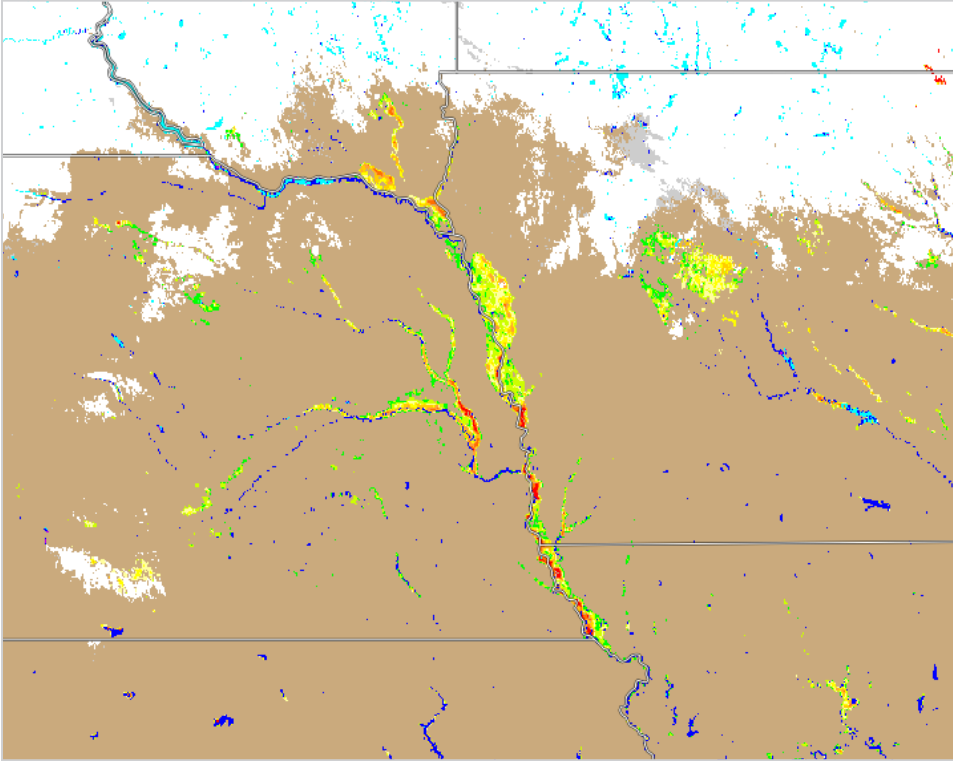
and snow in the mountains. GOES West water vapor imagery showed the rapid cyclogenesis that took place as the storm advanced across southern Colorado March 12-13.

[This intense, unusually deep mid-latitude cyclone met the criteria for a “bomb cyclone,”](#) rapid intensification of a cyclone (low-pressure system) with surface pressure falling by at least 24 millibars in 24 hours. A new all-time-low surface pressure occurred in Pueblo, Colorado, on March 13. The storm led to widespread flooding across parts of South Dakota, Nebraska and Iowa. [Forecasters used GOES-16 data to monitor the record flooding in the Midwest.](#)



GOES West water vapor imagery of winter storm on March 13. Credit: NOAA

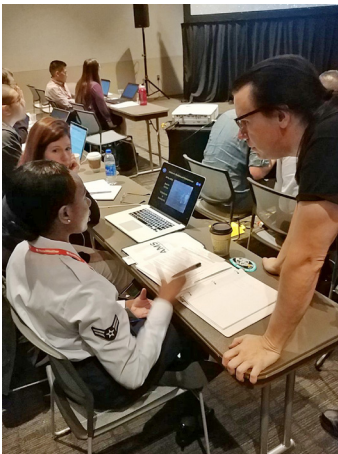
DATA AND IMAGERY (CONTINUED)



New NOAA flood products, like the [ABI daily river flood product](#), developed by algorithm scientists Sanmei Li and Donglian Sun at George Mason University with NOAA support, are helping forecasters determine where and when flooding will occur. As one NWS forecaster at the National Water Center's Water Prediction Operations Division said, "Our remote-sensing expert and forecasters have been enamored with this game-changing information."

Flooding in southeastern South Dakota, eastern Nebraska, and western/central Iowa is seen in this ABI daily river flood map on March 16. Flooding is seen in yellow, green, orange and red. Brown is land, and dark blue is normal water levels within bodies of water. White is snow cover, with ice shown in cyan. Credit: Sanmei Li and Donglian Sun, George Mason University and SSEC/RealEarth

CONFERENCES AND EVENTS



Chris Schmidt, associate researcher at the Cooperative Institute for Meteorological Satellite Studies, and one of the GOES-R short course instructors, assists a student during a hands-on exercise. Credit: Mat Gunshor

The AMS annual meeting was held January 6-10 in Phoenix, Arizona. The conference program included many presentations and posters focused on the GOES-R Series. In addition, a [GOES-R Series Forecasting Applications short course](#) was held on January

6. The short course showcased a brief overview of the ABI and GLM, insight on how to access existing resources, and an understanding of the options available to acquire GOES-R imagery and products. The course introduced users to techniques and applications to improve observations, forecasts, and warnings.



NOAA Testbeds and Proving Grounds Workshop participants. Credit: NOAA

The 10th NOAA Testbeds and Proving Grounds Workshop was held March 27-28 in Boulder, Colorado. The workshop focused on exchanging lessons learned and best practices within NOAA's testbeds and proving grounds and building cross-testbed synergy. Successes and challenges were highlighted and top strategic and tactical priorities were identified to increase future testbed and proving ground transitions to operations, applications, or commercialization. The workshop provided an opportunity to exchange information and enhance the use and effectiveness of outcomes in NOAA operations.

ACCOLADES AND AWARDS



Recent AMS fellows Mitch Goldberg (left) and Tim Schmit (right), sporting a (preliminary, non-operational) GOES-17 tie of Hurricane Michael. Credit: Chris Schmidt.

[Tim Schmit, NOAA research scientist stationed at the Cooperative Institute for Meteorological Satellite Studies, was elected an AMS Fellow for 2019.](#) Tim was one of 27 new Fellows who were honored at the 99th AMS Annual Meeting in Phoenix, Arizona, in January. Support letters for Schmit's AMS Fellow nomination noted his instrumental role in the success of GOES. His citation reads, in part, "Tim has dedicated his career to scientific support of multiple GOES missions and instruments, including the GOES-16 ABI. His research interests span calibration, visualization, and algorithm development and he is committed to research-to-operations, training others, and science communication."

MEET THE TEAM



In this issue, meet Dr. Gyanesh Chander, Deputy Project Manager for the GOES-R Ground Segment. Chander joined the program in early 2019 and in his new role he supports the Ground Segment Project Manager with planning, organizing, and directing technical and programmatic aspects of implementing the GOES-R Ground System. This includes the server replacement effort, implementation of cloud technologies, and long-range project planning. Prior to joining the GOES-R Program, Chander supported the Joint Polar Satellite System Ground Project as the Data Products Engineering and Services Manager, overseeing an integrated NASA/NOAA team responsible for design, development, integration and test, verification, deployment, sustainment, operations and maintenance of the two JPSS in-house systems. Before coming to NASA, Chander supported the Landsat Program at the U. S. Geological Survey Earth Resources Observation and Science Center in Sioux Falls, South Dakota.

Chander has received several awards during his career, including the NASA Group Achievement in 2018, NASA Exceptional Achievement in 2017, NASA/GSFC Excellence in Information Science & Technology in 2017, and a number of USGS group achievement and peer awards.

Chander received a Master of Science in electrical engineering in 2002, and a doctorate in geospatial science and engineering with specialization in remote sensing engineering in 2011, both from South Dakota State University. He resides in Bethesda with his wife and two children, and in his free time likes to listen to music, travel, and collect proverbs and fables. He also recently started collecting NASA mission pins, coins and patches.

UPCOMING EVENTS

GOES-R Program Summit

June 4-6
Melbourne, FL

AMS Conference on Broadcast Meteorology

June 12-14
San Diego, CA

NOAA Emerging Technologies Workshop

June 25-26
College Park, MD

NWS Satellite Applications Workshop

July 30 – August 1
Kansas City, MO

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