

GOES-R and GeoXO

QUARTERLY NEWSLETTER ■ APRIL-JUNE 2022 ■ ISSUE 38

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

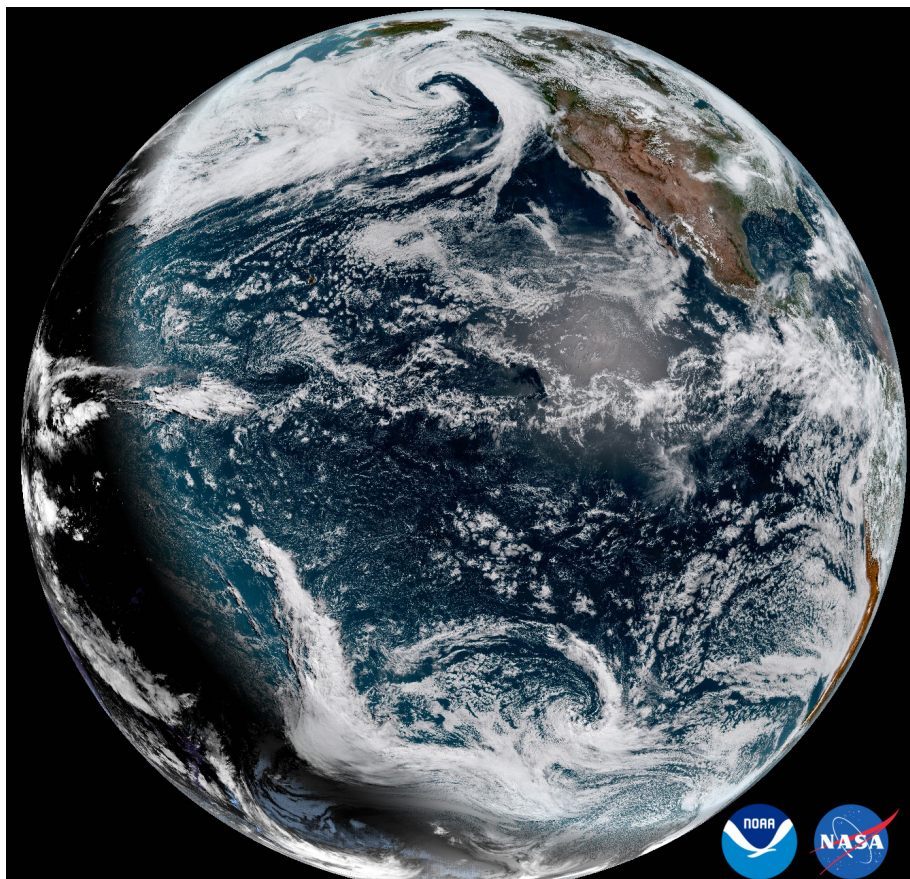


Hello team! I hope everyone is enjoying their summer and planning some downtime, which I know can be hard given everything we have going on. I am pleased to see GOES-18

doing well in post-launch testing, with the first imagery released from four of our instruments. GOES-18 is now operating near the GOES-West location, getting ready to provide operational ABI data to forecasters during the GOES-17 warm period outages. Congrats to everyone that worked to make the novel ABI 'interleave' and cloud delivery techniques possible. GOES-U is also making great progress, with the System Integration Review complete, and Pre-Environmental Review happening in mid-July. GeoXO is ever more active, with Phase A studies awarded for three more instruments, and preparations in high gear for the System Requirements Review in August. As COVID restrictions have been lifting, it has been great to see many of you in person these past few months. We will continue to allow our team members as much flexibility as we can, consistent with mission needs and agency guidance, in the transition to our new normal.

GOES-R PROGRAM HIGHLIGHTS

GOES-18 continues post-launch testing (PLT). [The satellite completed the first part of PLT at the central checkout location then drifted west to a position near the operational GOES West satellite.](#) PLT restarted on June 7, 2022. GOES-18 is undergoing a "split" post-launch testing phase that is different from that of GOES-16 and GOES-17. This test plan put GOES-18 into position near the current GOES West location earlier so its Advanced Baseline Imager (ABI) data will be available to forecasters during the "warm" periods that degrade some GOES-17 imagery during the height of hurricane season. NOAA plans for GOES-18 to replace GOES-17 as GOES West in early 2023.



GOES-18 view from 136.8 degrees west longitude on June 7, 2022. Image credit: NOAA/NASA

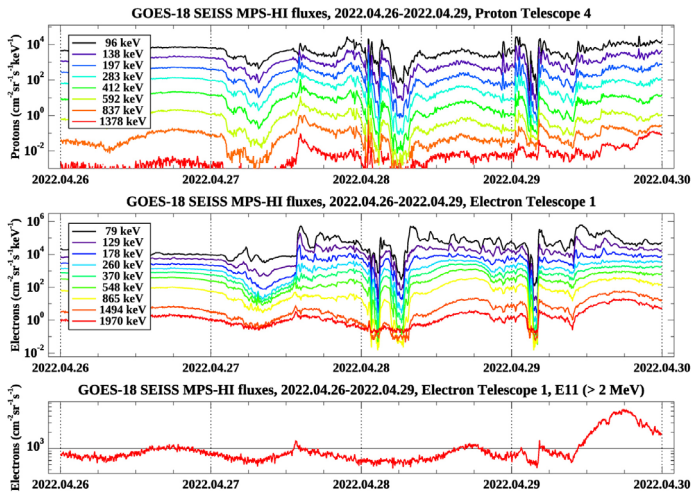


DID YOU KNOW:

Lightning is hotter than the surface of the sun. [It can reach temperatures around 50,000 degrees Fahrenheit!](#) Lightning Safety Awareness Week was observed June 19-25, 2022.

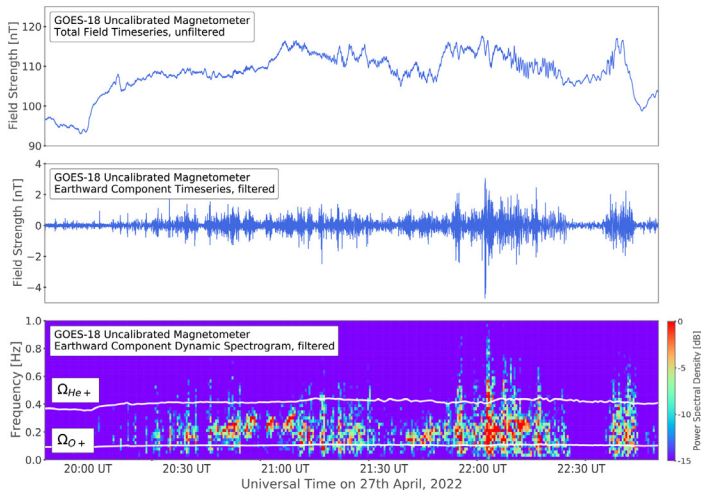
GOES-R PROGRAM HIGHLIGHTS (CONTINUED)

NOAA released the first data from the GOES-18 Space Environment In-Situ Suite (SEISS) instrument on May 3, 2022. [The GOES-18 SEISS detected several radiation belt disturbances on April 27-29, 2022.](#) Shortly after these observations were seen by the GOES-18 SEISS, NOAA's Space Weather Prediction Center (SWPC) issued an alert for a G1 (minor) geomagnetic storm, warning of possible risk to satellite systems due to charging.



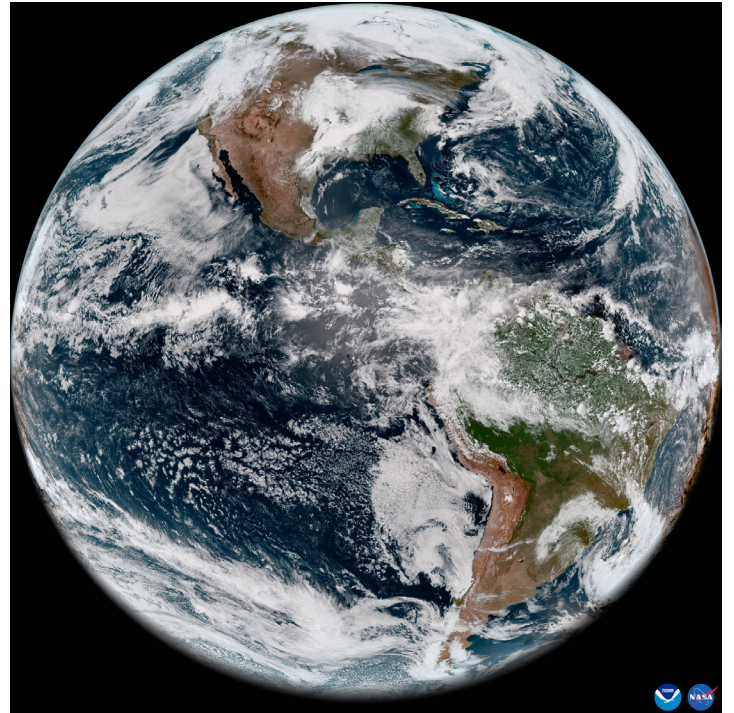
First public GOES-18 SEISS data. Image credit: NOAA/NASA

NOAA shared the first data from the GOES-18 Goddard Magnetometer (GMAG) instrument on May 4, 2022. [On April 27, 2022, the GOES-18 GMAG captured a space weather phenomenon known as plasma waves.](#) These waves play a significant role in controlling the levels of dangerous energetic particles that cause damage to satellites and harm astronauts. The GOES-18 GMAG is an upgraded magnetometer instrument that offers improved measurements of Earth's magnetic field over the magnetometers on GOES-16 (GOES East) and GOES-17 (GOES West).



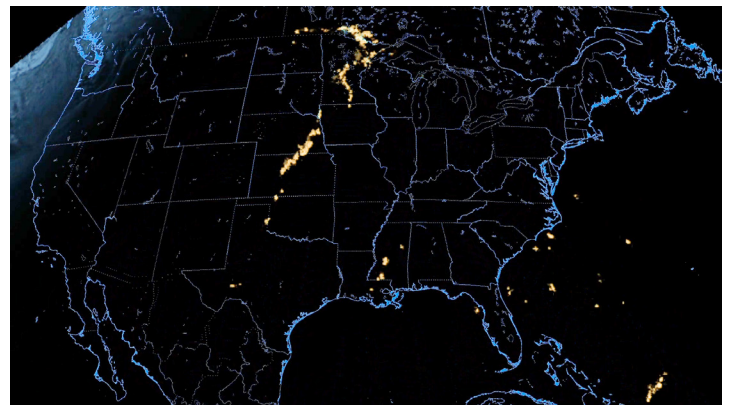
First public GOES-17 GMAG data. Image credit: NOAA/NASA

On May 11, 2022, NOAA debuted the first ABI imagery from GOES-18. ABI observed a number of weather events, environmental phenomena, and striking views of Earth. [An Earth from Orbit video and article highlighted severe storms, blowing dust, wildfires, and fog captured by the GOES-18 ABI.](#)



First public GOES-18 ABI imagery. Image credit: NOAA/NASA

On June 2, 2022, NOAA shared striking first imagery from the GOES-18 Geostationary Lightning Mapper (GLM). [GLM monitored lightning activity within severe storms across the U.S.](#) The instrument captured significant lightning activity in the derecho that moved across the Northern Plains on May 12-13, 2022.



First public GOES-18 GLM imagery. Image credit: NOAA/NASA

GOES-R PROGRAM HIGHLIGHTS (CONTINUED)

The GOES-R Product Readiness and Operations team published a new GOES-18 Transition to Operations Plan, including orbit location nudge activities, antenna pointing and re-peaking, and service transition schedule. See the [GOES-18 Transition to Operations webpage](#) for details.

On June 14, 2022, NOAA completed a successful test of the data interleave configuration on the GOES-17 satellite. This test was a user readiness opportunity to prepare for the operational interleave configurations planned for Aug. 1 – Sept. 6 and Oct. 15 – Nov. 11, 2022. The interleave configuration entails populating the operational GOES-17 GOES Rebroadcast (GRB) service with an “interleave” of GOES-18 ABI data (replacing the GOES-17 ABI data) with GOES-17 GLM and space weather data. Key GRB users were successfully able to receive and process the GOES-18 ABI data.

The Pre-Shipment Review for the GMAG that will fly on the GOES-U satellite was completed on May 19, 2022. On May 31, GMAG was delivered to Lockheed Martin for integration with the GOES-U spacecraft. This was the final GOES-U instrument delivery.

The GOES-U System Integration Review (SIR) was completed on June 8-9, 2022. The SIR evaluated the readiness of the overall GOES-U system to begin integration and test (I & T). The Standing Review Board determined all SIR criteria were met and I&T activities should continue.

The GEO ground system completed the installation of replacement servers in the Wallops Command and Data Acquisition Station Satellite Operations Zone Integration and Test Environment. This is part of the effort to replace IBM servers with Dell servers to meet a NOAA information technology security requirement.

On May 27, 2022, NOAA posted the request for proposals for Geostationary Ground Sustainment Services (GGSS). [NOAA is requesting proposals to award a single-award indefinite-delivery, indefinite-quantity contract for GGSS to extend the life of the GOES-R Series ground system.](#) Proposals are due on July 11, 2022.

GeoXO PROGRAM HIGHLIGHTS

NASA awarded several GeoXO instrument Phase A study contracts in April and May 2022. On April 20, NASA selected Northrop Grumman Corporation System Sector of Azusa, California, and Lockheed Martin Corporation of Littleton, Colorado, to conduct [GeoXO Lightning Mapper \(LMX\) Phase A Studies](#). On May 17, NASA selected Ball Aerospace & Technologies Corp. of Boulder, Colorado, and Raytheon Intelligence & Space of El Segundo, California, to conduct [GeoXO Atmospheric Composition \(ACX\) instrument Phase A Studies](#). On May 26, NASA selected Ball Aerospace & Technologies Corp. of Boulder, Colorado, and Raytheon Intelligence & Space of El Segundo, California, to conduct [GeoXO Ocean Color \(OCX\) instrument Phase A Studies](#). Each company will conduct a twenty-month definition-phase study to develop the instrument concept and mature necessary technologies. The studies will help define each instrument’s potential performance, risks, costs, and development schedule.



The GeoXO OCX instrument would monitor harmful algal blooms, like the one seen here in Lake Erie, captured by the USGS-NASA Landsat satellite. Image Credit: USGS/NASA Earth Observatory

The GeoXO Imager (GXI) Phase A Study is now complete. The program held final review meetings with L3Harris and Raytheon in late April to examine the technical work conducted during the twelve-month definition-phase GXI studies. The companies submitted final reports in May. The program plans to release a request for information for the GXI implementation contract in July.

NOAA and the WFIRE Lab at the University of California, San Diego, conducted a NOAA Pathfinders fire tabletop exercise on April 22, 2022. The exercise examined the historic 2020 Bobcat wildfire to help NESDIS understand how data and products support decision-making, what type of information is used within different stages of fire preparedness and response, and what key challenges and limitations end-users currently face when using satellite data and products before and during wildfire response. This tabletop exercise helped build relationships between stakeholders and NOAA/the GeoXO Program, enhanced user engagement by assessing current data needs and gaps, and expanded NOAA’s understanding of how end users leverage satellite data and products.

IMAGERY AND SCIENCE APPLICATIONS

On April 22, 2022, NOAA and NASA celebrated Earth Day. Before we had satellites, we could only imagine what Earth looked like from above. Our view has come a long way, from changes in technology to how we understand Earth's systems. Built upon NASA's pioneering efforts, [NOAA's satellite program continues to improve Earth observations from space](#). Since 1970, NOAA satellites have monitored Earth's weather, environment, oceans, and climate.



NOAA celebrates Earth Day 2022. Image credit: NOAA/NASA

In April 2022, NOAA satellites tracked wildfires burning across parts of the Southwest and Plains. The two largest fires were located in northern New Mexico – the Calf Canyon and Hermits Peak fires. GOES-17 watched smoke billowing over the region and drifting to areas upwind bringing hazy skies to communities many miles away. GOES-17 and GOES-16 also detected hot spots from the fires in near-real-time while providing information on the size and intensity of these fires. NOAA-20 and Suomi NPP captured daytime and nighttime images of the fires. They also took air quality measurements and tracked the movement and thickness of smoke over the region. [As fire season starts earlier and ends later, NOAA satellites are keeping watch](#).



GOES-17 imagery of wildfires burning in New Mexico. Image credit: NOAA

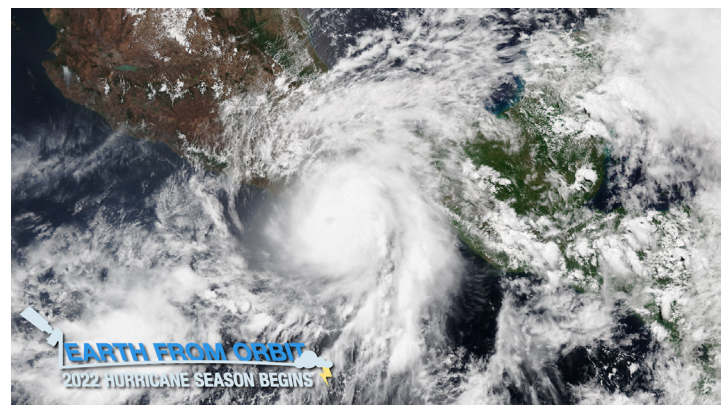
The NOAA Satellite Proving Ground Hazardous Weather Testbed Spring Experiment concluded in June 2022.

During the spring experiment, National Weather Service (NWS) operational forecasters evaluated several [GOES-16, GOES-17, and Joint Polar Satellite System \(JPSS\) satellite products for their utility in severe storm warnings](#).

A team of scientists from NESDIS and South Dakota State University has developed more accurate forecasts to predict the impacts of wildfire smoke on air quality.

[The method known as Regional Hourly ABI and Visible Infrared Imaging Radiometer Suite \(VIIRS\) Emissions, or RAVE](#), combines observations from instruments on NOAA's geostationary and polar-orbiting weather satellites to calculate estimates of wildfire emissions.

The 2022 hurricane season is officially underway. The eastern Pacific hurricane season began on May 15, while June 1 marked the beginning of the Atlantic hurricane season. [NOAA satellites monitored the first named storms in each hurricane basin](#). Tropical Storm Agatha formed in the eastern Pacific Ocean on May 28 and rapidly intensified into a Category 2 hurricane. On May 30, Agatha became the strongest hurricane on record to make landfall along the Pacific coast of Mexico in May. Remnants from Agatha helped fuel what would become the Atlantic's first named tropical storm, Alex, which affected South Florida at the beginning of June. NOAA satellites provide vital information for forecasting hurricanes and monitoring the location, movement and intensity of storms.



GOES-17 imagery of Hurricane Agatha. Image credit: NOAA

June 21, 2022 marked the official start of astronomical summer in the Northern Hemisphere. [The summer solstice — the longest day and shortest night of the year — is the moment the hemisphere reaches its greatest tilt toward the sun](#). As Earth rotates on its axis, the North Pole experiences 24 hours of daylight, while the South Pole is

IMAGERY AND SCIENCE APPLICATIONS (CONTINUED)

observed in darkness. NOAA's GOES-16 and GOES-17 constantly observe the same region of Earth, allowing a view of the terminator as it moves across the Western Hemisphere. The terminator is the edge between the shadows of nightfall and the sunlight of dusk and dawn. The slope of the terminator curve changes with the seasons.

Semi-annual NOAA/NASA Research Opportunities in Space and Earth Sciences (ROSES) reports for the time period Sept. 2021 – Feb. 2022 have been posted. These grants are intended to advance research and practical applications using data derived from instruments aboard U.S. and international geostationary satellites. These include NOAA's GOES-R Series, the Japan Meteorological Agency's Himawari, and Korea's GEO-KOMPSAT-2A. [These research projects will address ways to improve the generation of data products and/or the utilization of data products in scientific research and operational applications from operational geostationary satellite data.](#)

Throughout June 2022, NOAA satellites monitored wildfires in Alaska that have burned more than 1.6 million acres. Unusually hot and dry weather in the region increased the risk of fires. These conditions led to more than 300 fires in recent weeks, with many sparked by lightning. On May 31, lightning ignited the East Fork Fire and burned over 250,000 acres, making it one of the largest tundra fires on record. Meanwhile, the Lime Complex Fire has burned more than 600,000 acres in southwestern Alaska. [As Alaska's historic wildfire season continues, NOAA satellites are keeping watch.](#)



Historic wildfire season underway in Alaska. Image credit: NOAA

EDUCATION AND OUTREACH

GOES-R Program Scientist Dan Lindsey was interviewed for an episode of NASA's Curious Universe podcast, released on May 31, 2022. ["Earth's Weather Watchers"](#) explained Earth's fascinating weather and how NASA and NOAA work together to predict, monitor, and respond to Earth's ever-changing weather.

GOES-R and GeoXO System Program Director Pam Sullivan was interviewed for NASA's "Small Steps, Giant Leaps" podcast for an episode titled ["NASA's Role in Weather Research,"](#) which was released on May 18, 2022. Satellite technology has drastically changed weather forecasting and the conversation focused on NOAA's geostationary and polar-orbiting weather satellite missions and the inter-agency collaboration that makes them so successful.

NOAA's Cooperative Institute for Meteorological Satellite Studies (CIMSS) announced the first-place projects in the 2022 GOES-16/17 Virtual Science Fair on June 1, 2022. [Students from nine schools around the U.S. submitted projects that used GOES 16/17 satellite data to investigate topics ranging from wildfires to severe weather to lightning and the Hunga Tonga volcano eruption.](#) Each individual/team shared their project through a scientific poster and a short video presentation. Three projects earned honorable mentions and two took first place. Participating students excelled in explanations and examples of how different ABI bands provide insight into natural phenomena and extreme weather events.

CONFERENCES AND EVENTS

On May 2, 2022, the NOAA Satellite Proving Ground held a virtual meeting at which satellite liaisons, NWS personnel, and cooperative institute representatives provided briefings on proving ground activities at several NWS national centers and offices. They discussed various experimental satellite products and recent/upcoming testbed activities taking place at each respective center/office. The meeting informed interested parties, mainly from NESDIS and NWS, about satellite proving ground activities.

On May 3, 2022, GOES-R Program Scientist Dan Lindsey participated in the Getting to Know Goddard speaker

series with JPSS Program Scientist Satya Kalluri. A constellation of NOAA satellites scans our planet and feeds global weather models, allowing for daily weather forecasts. These satellites tell us about wildfires, volcanoes, floods, fogs, atmospheric ozone, sea ice, and sea surface temperatures. In collaboration with the NOAA, NASA's Goddard Space Flight Center (GSFC) builds and operates the satellites. ["Tracking Earth's Weather from Space"](#) highlighted NOAA's geostationary and polar-orbiting satellite programs, how the two agencies collaborate, and plans for future weather forecasting capabilities.

CONFERENCES AND EVENTS (CONTINUED)



From left, Tim Walsh, Greg Mandt, Dennis Andrucyk, and Pam Sullivan at the kinetic sculpture ribbon-cutting event. Photo Credit: NASA/Liz Wilk

On May 19, 2022, the GOES-R and JPSS Programs celebrated the completion of a new outdoor exhibit and kinetic sculpture at the NASA GFSC Visitor Center with a ribbon-cutting event. The exhibit,

located in the outdoor rocket garden area, was designed to engage, educate and inform audiences about how GOES-R and JPSS satellite constellations advance weather and environmental hazard forecasting and the role these satellites play in expanding scientific knowledge. GSFC Center Director Dennis Andrucyk, GOES-R System Program Director Pam Sullivan, JPSS System Program Director Tim Walsh, and former JPSS and GOES-R System Program Director Greg Mandt provided remarks about the long, collaborative relationship between NOAA and NASA and the role of GSFC in the satellite missions. [View additional photos.](#)

Several GeoXO team members presented at the European Space Agency Living Planet Symposium, held May 23-27, 2022, in Bonn, Germany. [The symposium allowed scientists to present their latest findings on Earth's environment and climate derived from satellite data and also focused on Earth observation's role in building a sustainable future and a resilient society.](#) The GeoXO team also participated in a technical interchange meeting

with European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) colleagues.

A NOAA GeoXO Ocean Town Hall was held virtually on June 15, 2022. Experts from NOAA's National Ocean Service, NOAA Fisheries, and NESDIS provided an overview of the current footprint of the OCX instrument data, products, and services. This event socialized OCX with a broader community of oceanographers across NOAA Line Offices by sharing the instrument capabilities and how they will affect work across NOAA.

An American Meteorological Society (AMS) short course was held virtually on June 21, 23, 28, and 30, 2022. "[Use of Environmental Satellite Data Products for Detecting Volcanic Eruptions, Forecasting Tropical Cyclones, and Nowcasting Severe Weather](#)" provided participants with the working knowledge needed to access and apply satellite data products to forecast/monitor severe weather, volcanic eruptions, and tropical cyclones. The participants learned how to access satellite data products and apply them.

The Community Satellite Processing Package (CSPP) User Meeting was held June 21-23, 2022 at the University of Wisconsin-Madison. The meeting brought together the worldwide community, representing more than 100 countries and all 7 continents, of CSPP low-Earth orbit and geostationary users to discuss issues relevant to reception, processing, and applications of data acquired by direct broadcast. Scientists presented GOES-R data applications and provided the status of the GeoXO program and user engagement efforts.

MEET THE TEAM



In this issue, meet India Gregory, GOES-R/GeoXO program support specialist. India joined the program in January 2022. In this role, she assists the science team with travel preparations. She also ensures the program office is a nice space to visit and a helpful place to obtain supplies. India is enthusiastic about her new role. "Each day feels so new. My favorite part of the job is the proximity I have to so much knowledge about the things that matter most to me," she said. "The

nature of the mission feeds my soul."

Prior to joining the GOES-R/GeoXO program, India worked as an accounts payable specialist for a private insurance company and then as a contractor for the Department of Health as a project controller for a digital health application.

Outside of work, India enjoys going to a park and being still and present in the moment. She also loves to write down her ideas in hopes of creating a large body of work to leave behind as her legacy. She enjoys meeting new people and looks forward to getting to know her new coworkers.

UPCOMING EVENTS

GOES-U Pre-Environmental Review

July 13-14, 2022

NOAA Satellite Conference/Collective Madison Meeting

Aug. 8-12, 2022

GeoXO System Requirements Review

Aug. 24-26, 2022

GLM Science Team Meeting

Sept. 13-14, 2022

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