JOINT POLAR SATELLITE SYSTEM PROGRAM

NEWSLETTER

2017 • QUARTER #1

FROM GREG

JPSS had a successful 2016, and the Suomi NPP satellite is still providing excellent data in its fifth year of service. We are preparing for the launch of JPSS-1 in late 2017, and I am honored to be taking over the program at this critical time. The team is working tirelessly towards this landmark to ensure the continuity of our polar-orbiting data.

This quarter has seen some important milestones including the reintegration of the ATMS instrument with the spacecraft bus and the successful transition to the Block 2.0 ground communications system. Both of these events bring us closer to a smooth and successful launch of JPSS-1 and an operational NOAA-20 satellite, as it will be known once on-orbit. I look forward to a great year ahead.

To learn more, you can read previous issues of the JPSS Newsletter here.

TECHNICAL UPDATES

- The National Environmental Satellite, Data and Information Service has transitioned the Suomi National Polar-Orbiting Partnership (Suomi NPP)/Global Change Observation Mission-Water 1 (GCOM-W1) new data processing and distribution systems (Block 2.0 and Product, Distribution and Access) to operations.
- The Advanced Technology Microwave Sounder (ATMS) has returned to Ball Aerospace & Technologies Corporation and has been reintegrated with the spacecraft bus. The spacecraft is currently undergoing thermal vacuum testing.
- NASA has awarded the Suomi NPP Sustainability contract to Ball Aerospace & Technologies Corp. (BATC) of Boulder, Colorado. Under this contract, BATC will continue to provide sustaining engineering services to the Joint Polar Satellite System (JPSS) Flight Project and NOAA's Office of Satellite and Product Operations for the mission operations systems and subsystems and deactivation of the Suomi NPP satellite. This effort will maintain the current operational phase of the satellite through the Suomi NPP mission life including deactivation and contract closeout.
- NASA has selected United Launch Services LLC (ULS) of Centennial, Colorado, to provide launch services for the JPSS-2 mission. Launch is currently targeted for 2021 on an Atlas V 401 rocket from Space Launch Complex 3E at Vandenberg Air Force Base in California.

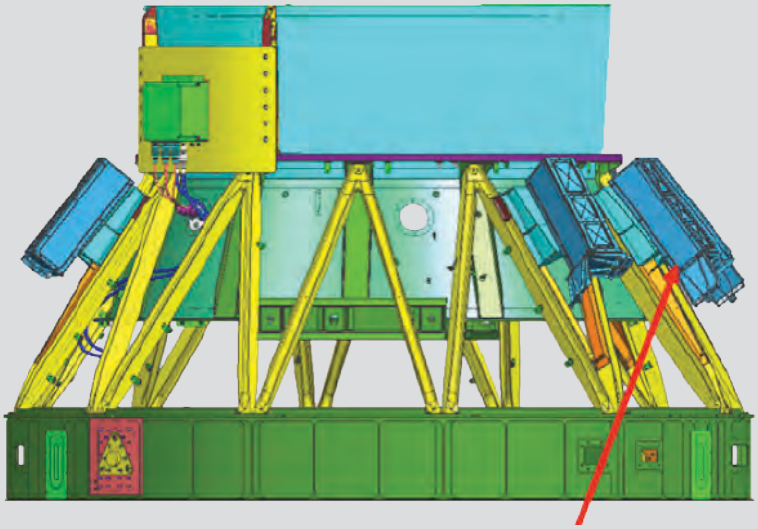
DID YOU KNOW *that the NOAA-Unique Combined Atmospheric Processing System (NUCAPS) turns CrIS and ATMS data into useful atmospheric profiles?*

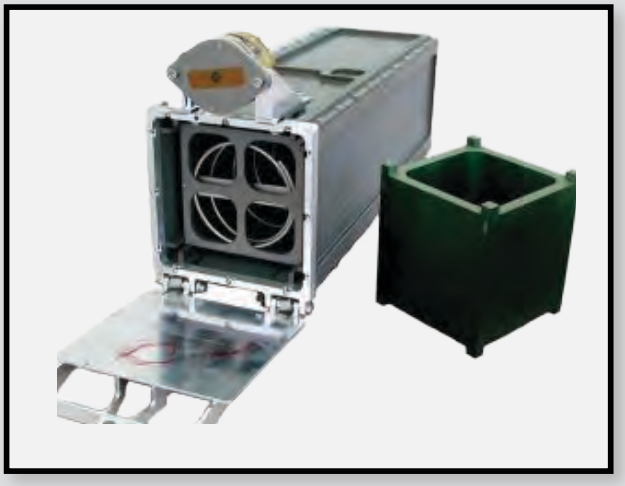
CUBESATS FLY WITH JPSS-1

Did you know that there will be CubeSats launched alongside NOAA's JPSS-1 later this year? The CubeSats are part of the Educational Launch of Nanosatellites (ELaNa) program which is part of NASA's CubeSat Launch Initiative.

So what are CubeSats? CubeSats are small satellites, approximately four inches per side, which can be attached to a larger mission and used for educational, research and development purposes. These tiny satellites will accompany the JPSS-1 spacecraft inside the rocket fairing on board the Delta II rocket that will take the satellite into space from Vandenburg Air Force Base in California.

ELaNa missions are selected by a NASA review panel and awardees are tasked with the design, development and delivery of the CubeSats. The program provides universities and non-profit organizations with hands-on experience developing flight hardware and enables NASA to develop public-private partnerships while strengthening the Nation's future STEM workforce. The JPSS-1 satellite will carry payloads for four universities whose mission objectives include STEM engagement, technology development and research into the effects of space radiation on semiconductor memory hardware. The CubeSats launching with JPSS-1 include:





CubeSats are stored in and launched from P-PODs attached to the second stage of the rocket.

- ***EagleSat***—Embry-Riddle Aeronautical University, Prescott, Arizona
- ***MakerSat***—Northwest Nazarene University, Nampa, Idaho
- ***MiRaTA***—Massachusetts Institute of Technology, Cambridge, Massachusetts
- ***RadFxSat***—Vanderbilt University, Nashville, Tennessee

During the launch sequence, the CubeSats will deploy after the primary payload separates from the rocket. The CubeSats will be released by Poly-Picosatellite Orbital Deployers (P-PODs) which are attached to the second stage of the Delta II rocket. The P-PODs will deploy the nanosatellites between 24 and 28 minutes after the separation of the JPSS-1 satellite.

The primary payload of the upcoming launch, JPSS-1, will continue NOAA's 40-year legacy of polar-orbiting satellite data. JPSS provides meteorological data and environmental observations for mid-range and long-term monitoring and forecasting. NOAA and NASA support the education and development of the next generation of scientists through programs like the CubeSat Launch Initiative and other outreach activities.

MEET THE TEAM: DR. CARA WILSON

Research Scientist, Environmental Research Division, Southwest Fisheries Science Center

Q: How and why do you use JPSS data?

A: Myself and other scientists in the National Marine Fisheries Services and National Ocean Service use satellite data in our research. The Visible Infrared Imaging Radiometer Suite (VIIRS) instrument aboard the JPSS satellites provides invaluable data about the oceans including ocean color (which indicates chlorophyll levels) and sea surface temperature.

Q: What would be the impacts if JPSS data were no longer available to you?

A: JPSS data is important because the chlorophyll data we are getting from VIIRS is the continuation of a time series of data dating back to 1997. To understand interannual variability in fish stocks, it is crucial that we have science-quality time series of marine environmental data to manage these resources and try to predict any future changes to them.

DID YOU KNOW *that you can find new JPSS brochures, fact sheets and FAQs online at* www.jpss.noaa.gov?

INTERNATIONAL COLLABORATION LEADS TO MORE DATA FOR U.S. WEATHER FORECASTS

The recent Annual Meeting of the American Meteorological Society (AMS) in Seattle, Washington included the Gary K. Davis Memorial Session on environmental satellites. During his 37-year career at NOAA, Gary Davis worked to ensure the continuity of our environmental data while forging international partnerships that have lasted through the years.

In the late 1980's, a satellite launch failure along with development delays threatened the U.S. with a loss of geostationary environmental satellite data. Fortunately, Gary Davis led the efforts to secure backup services from a European satellite to aid in U.S. monitoring and arranged for a long term backup agreement between the international meteorological agencies. Thanks to this dynamic and critical tactic, the European meteorological satellite agency, EUMETSAT, has been a partner of NOAA's satellite fleets ever since. Gary Davis continued to build relationships at NOAA and abroad, helping to ensure the successful delivery of both geostationary and polar-orbiting satellite data products that persists to this day.

Recently, EUMETSAT and JPSS signed the Joint Polar System Agreement and Program Implementation Plan. The Agreement continues the long-standing polar-orbiting cooperation of data sharing between the two organizations, utilizing ground assets operated by both agencies. It will cover the JPSS program through the JPSS-4 satellite and include all satellites within the EUMETSAT Polar System—Second Generation series.

As noted by many presenters at the Annual Meeting, additional data greatly improves numerical weather models. Working with our international partners, we leverage remote and ground systems to collect more observations. The upcoming JPSS-1 satellite will double the amount of high quality data currently being collected by the NOAA/NASA Suomi NPP satellite, further improving weather forecasting models.

EVENTS AND CONFERENCES

97TH ANNUAL MEETING OF THE AMERICAN METEOROLOGICAL SOCIETY

The American Meteorological Society (AMS) held its Annual Meeting on January 22–26, 2017 in Seattle, Washington with over 4,500 attendees. The meeting included 42 symposia and conferences on subjects including observations and instrumentation, modeling and analysis, aviation and aerospace meteorology, atmospheric chemistry, ocean and coasts, space weather, satellite data, policy, communications, climate and more. The JPSS Program was heavily involved in the 13th Symposium on New Generation Operational Environmental Satellite Systems.

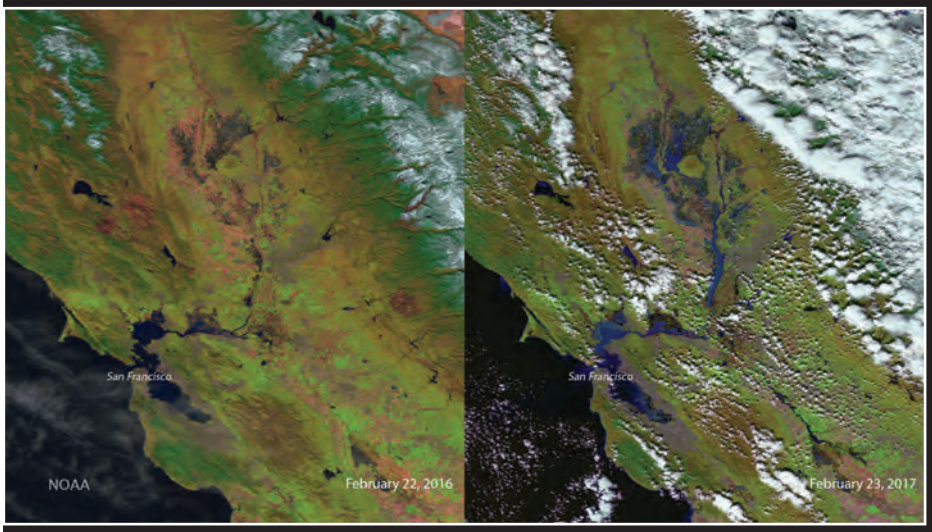
The weekend before the conference, JPSS offered a short course titled 'Experiencing JPSS Capabilities' for new and existing users. Over 40 attendees learned about JPSS data products and algorithms for improved user experience by applying JPSS capabilities in real-world scenarios on topics including sea ice coverage, fire and smoke products, severe convective weather and tropical storm analysis. The students rated the course highly and JPSS is exploring the possibility of providing the course material online.

Students, researchers and JPSS program staff worked together during the JPSS short course.

The JPSS program also organized the third Annual Speed Networking Event for Students and Early Career Professionals as part of the fifth AMS Symposium on the Joint Center for Satellite Data Assimilation. Dr. Stephen Volz, the Assistant Administrator for Satellite and Information Services at NOAA, welcomed the attendees and served as a mentor during the program.

Learn more about JPSS instruments and applications in an informational overview video—you can view and download it here.

INTERESTING IMAGES



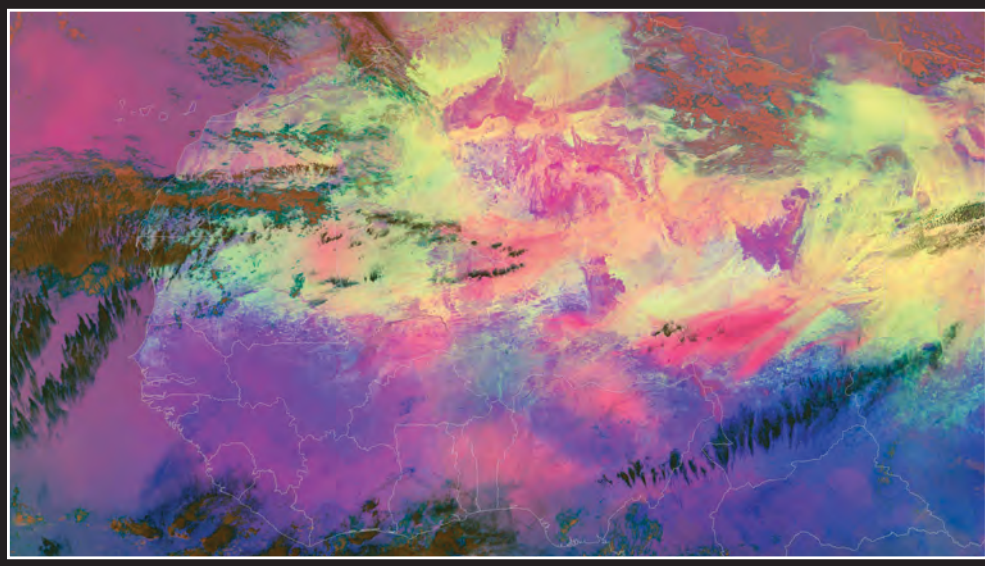
◀ RECENT RAINS SWELL LAKES AND RIVERS IN CENTRAL CALIFORNIA

These color-enhanced composite images captured by the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument aboard the NOAA/NASA Suomi NPP satellite in 2016 (left) and 2017 (right) show just how much the recent West Coast rains have swollen California's lakes and rivers downslope of the Sierra Mountains.

The image at left, taken February 22, 2016, shows the state of California's lakes and rivers during a time when a large portion of the state was, according to the National Drought Monitor, suffering from "extreme" to "exceptional" drought. The image at right, captured on February 23, 2017, tells a much different story. Note a significant difference in the width of the rivers, which suggests just how much water the series of recent storms added to them. Not surprisingly, current Drought Monitor statistics now show most of the state to be free from drought.

Credit: NOAA/NASA

CLOUDS AND DUST OVER AFRICA ▶



A large dust cloud hangs over the Atlantic along the northwestern coast of Africa in this color-enhanced image captured by the NOAA/NASA Suomi NPP satellite's Visible Infrared Imaging Radiometer Suite (VIIRS) instrument on December 27, 2016.

The bright colors shown here are the result of a "dust enhancement"—an experimental data product created by scientists at the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT). Based on infrared channel data, this enhancement was created to help analysts monitor the evolution of dust storms. According to EUMETSAT, monitoring of dust in the atmosphere 24 hours a day can be a challenge because the appearance of dust in satellite imagery changes drastically from day to night. Incorporating VIIRS day/night band into the mix of channels used to produce these images makes it easier.

So where is the dust visible in this image? Well, it's not represented by the orange/brown color—that's atmospheric moisture. Rather, the dust appears as magenta or pink. The other colors denote the following: Reds mark thick cirrus clouds, dark blues are thin cirrus clouds, and the other shades of blue indicate the surface (land and water) of the Earth. The bright yellow is the hot surface of the Sahara.

Credit: NOAA/NASA