JPSS Proving Ground & Risk Reduction Program Call for Proposals

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What is the Proving Ground & Risk Reduction Program for JPSS?

The JPSS Proving Ground and Risk Reduction (PGRR) program's primary objective is to maximize the benefits and performance of NPP/JPSS data, algorithms, and products for downstream operational and research users (gateways to the public) through:

- Engaging users to enhance/improve their applications through the optimal utilization of JPSS data.
- Education, Training and Outreach
- Facilitating transition of improved algorithms to operations.
- Detailed characterization of data attributes such as uncertainty (accuracy and precision) and long-term stability
- Provides user feedback to the cal/val program

FY 12-15 Projects

- The PGRR Program was established in 2012 with nearly 40 proposals selected for funding. Most projects are in their final year of funding.
- Project leads work with users to determine how best to use JPSS data products and to transition these capabilities to operations
- PGRR established Proving Ground Initiatives: River Ice and Flooding, Fire and Smoke, NOAA Unique CrIS/ATMS Processing System (NUCAPS)

FY15 & 16 Call for Proposals

- New JPSS PGRR Call for Proposals was released on December 2, 2014.
  - Call focuses on 13 initiatives
- Over 130 Letters of Intent were received.
- New projects will be selected by the JPSS PGRR Executive Board (with feedback from relevant users and stakeholders) in March/ April

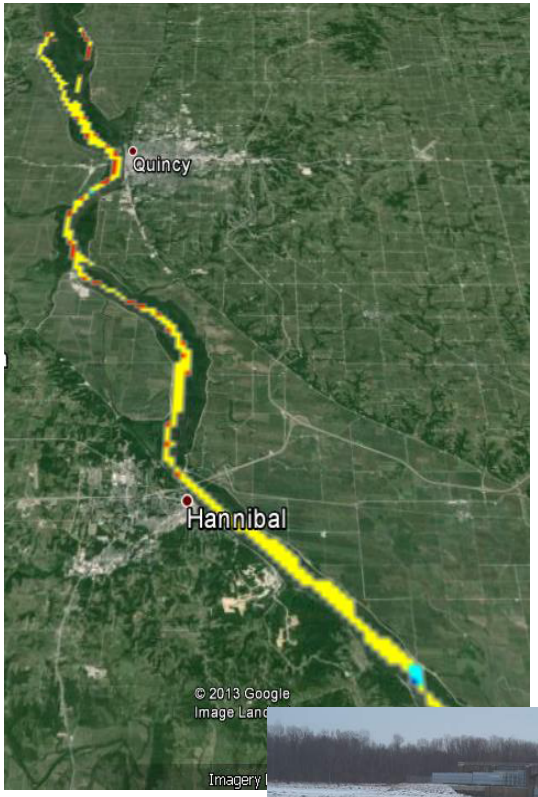
PGRR Initiatives

- **River Ice and Flooding (6)**
- **Fire and Smoke (5)**
- **Sounding Applications including NOAA Unique CrIS/ATMS Processing System (NUCAPS) (17)**
- NWP impact studies (via HRRR and GFS) and other critical weather applications (13)
- OCONUS and NCEP Service Centers AWIPS Initiative (9)
- Cryosphere Initiative (5)
- Land Data Assimilation (7)
- Ocean and Coastal (12)
- Atmospheric Chemistry (1)
- Hydrology (6)
- Aerosol Data Assimilation (3)
- Innovation (40)
- Training (8)

*Number of Letters of Intent received in parentheses

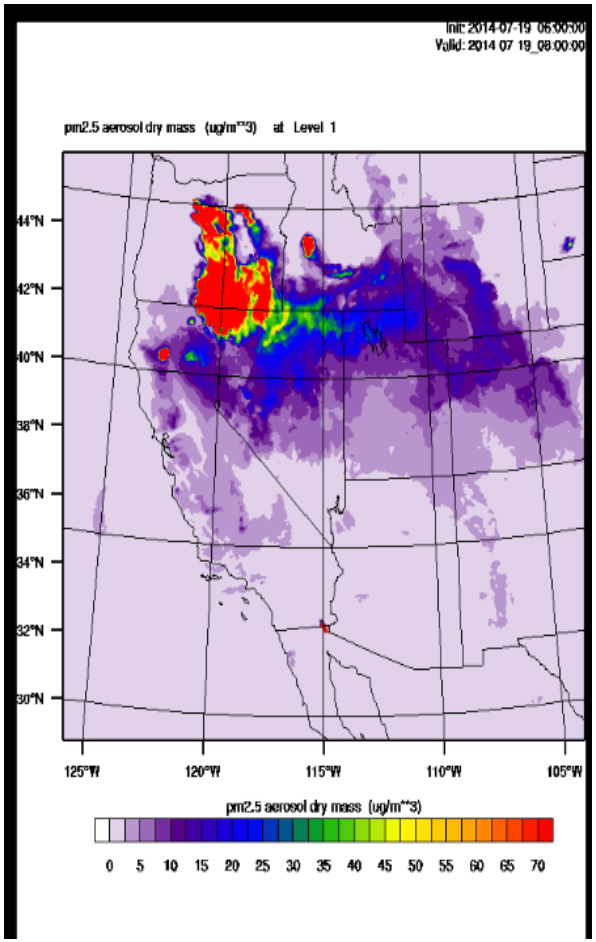
River Ice and Flooding

- Ice products to identify locations of river ice and its state
- Flood products to specify the areal extent of the flooding and the capability of overlaying the product on geographic maps and provide an estimation of the depth of the flood waters.
- Users: Primarily the NWS River Forecast Centers
- Focused on VIIRS



Hanibal, MO
Ice Jam
(Jan-Feb 2014)

Fire and Smoke



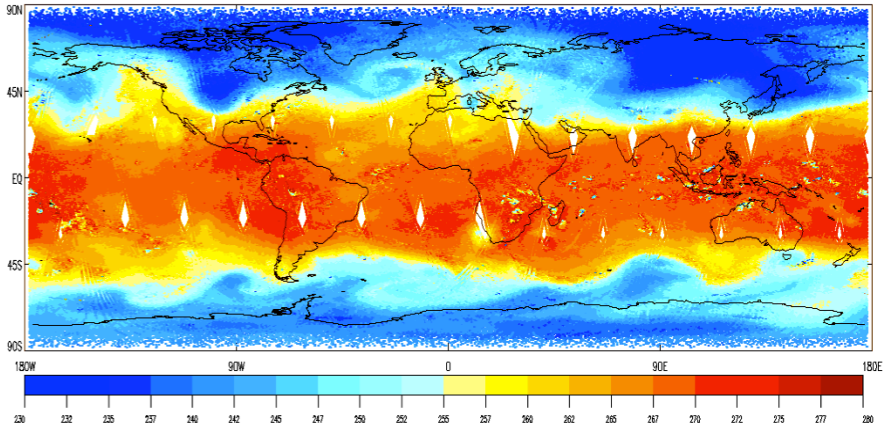
Example of HRRR Smoke Product

- Makes use of the VIIRS active fire location, fire radiative power and aerosol optical depth, and potentially OMPS derived aerosols to predict fire movement and dispersion of smoke using high spatial resolution and timely forecast models
- Products focus on determining the current location of a fire and gathering as much information as possible on its history.

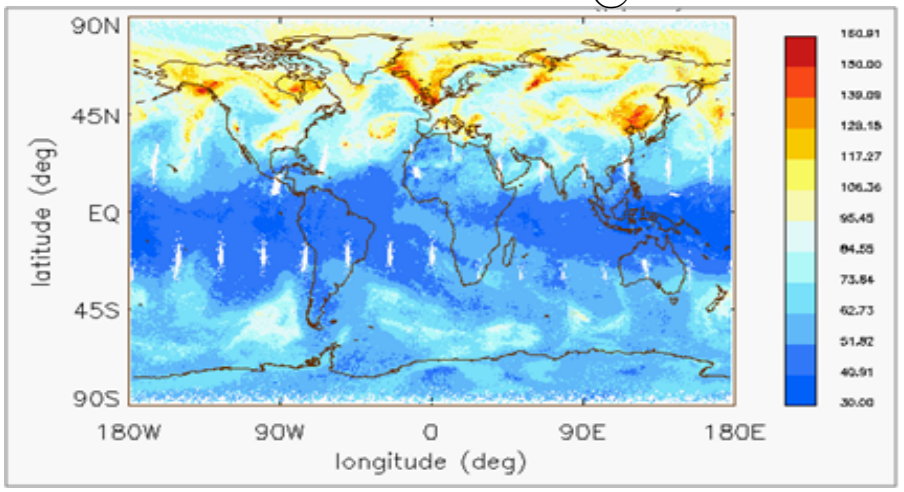
Sounding

- Assist WFOs to make better use of NUCAPS temperature and moisture soundings
- Support NWS/NCEP plans to improve data assimilation of radiances in cloudy conditions
- Use NUCAPS to solve for or derive trace gases

NUCAPS Temperature retrieval @ 500mb (January 5th 2014 Polar Vortex Anomaly)

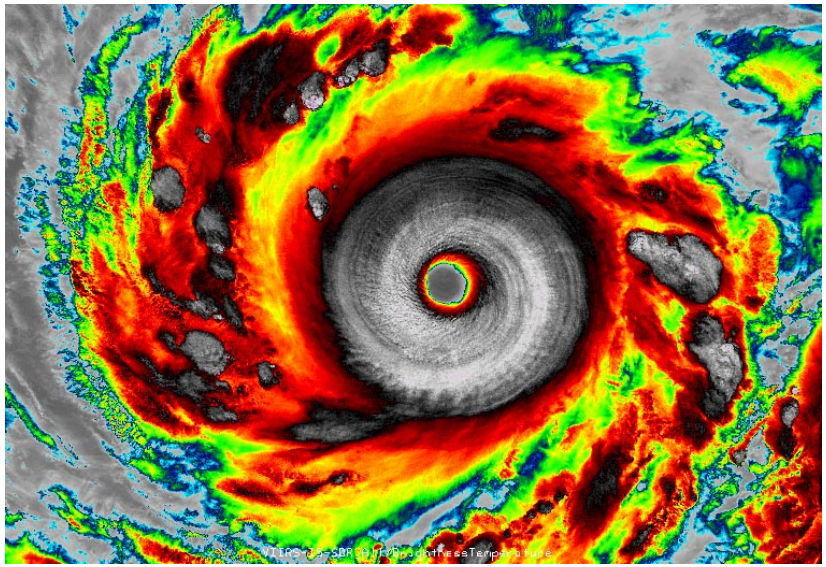


NUCAPS Ozone retrieval @ 500mb



NWP Impact Studies and Critical Weather Applications

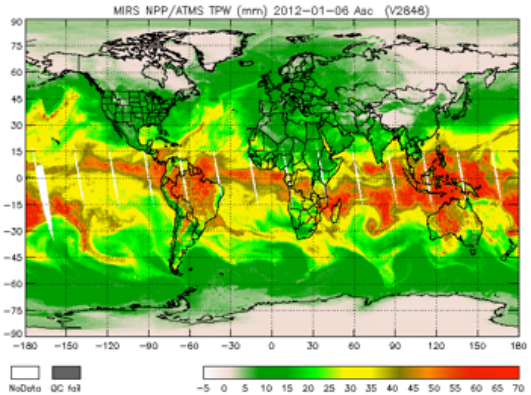
- Studies on the impact of CrIS and ATMS on the GFS, HRRR, and other operational models to evaluate the performance of these sounders in context with legacy instruments in order to provide feedback on capabilities
- Critical weather applications include focus on use of data products for improving tropical cyclones and other severe weather events.



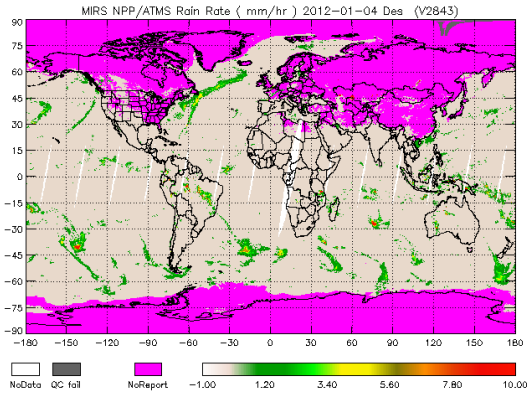
Infrared VIIRS image, October 7, 2014
Super Typhoon Vongfong

OCONUS and NCEP AWIPS

- Seeks new, innovative applications for improving the analysis and forecast of weather phenomena. Priority applications include:
  - multi-source products that combine like information from multiple geostationary and polar-orbiting satellites, potentially composited with in-situ observations and model forecasts,
  - techniques that limit the impact of space and time gaps between polar-orbiting satellite passes,
  - improvements to current satellite products and imagery that make them more useful in data sparse regions (e.g., rainfall rate, cloud properties, etc.),
  - concepts that apply satellite data to address longstanding forecast concerns (e.g., ice, very cold tropospheric temperatures, fog, etc.), and
  - innovations for displaying and interacting qualitative and quantitative data.



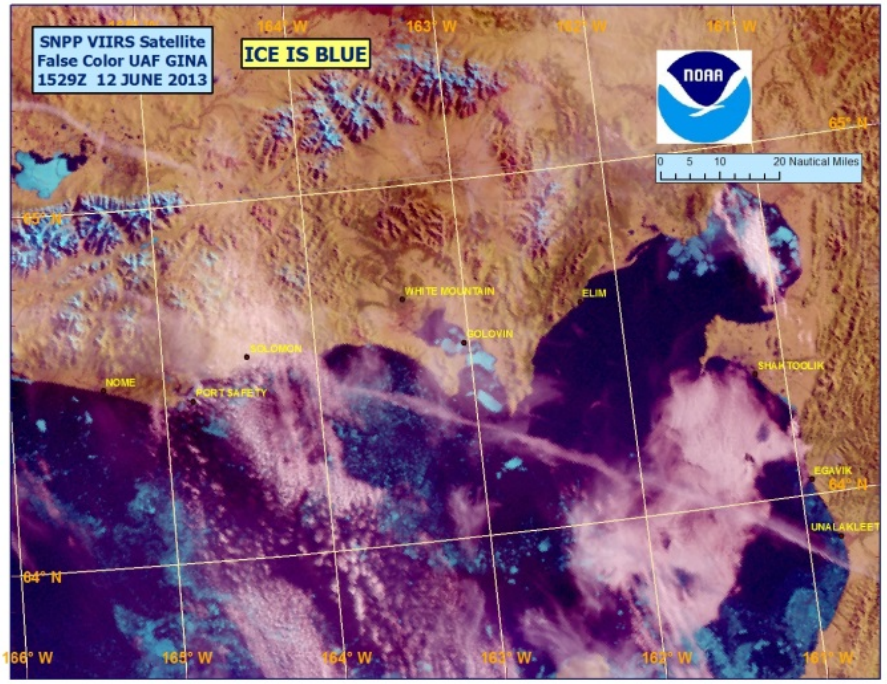
Total Precipitable Water



Rain Rates

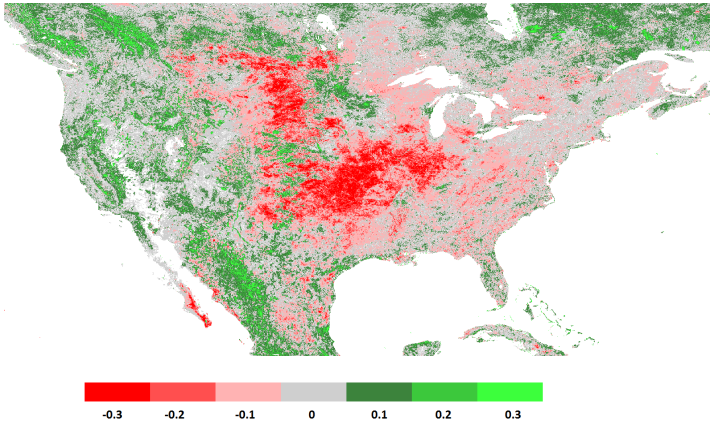
Cryosphere

- Improve the utilization of JPSS and other snow and ice products in numerical weather prediction, hydrological analysis and forecasting, climate reanalyses, and ice operations.
- Users: NOAA's Alaska Pacific River Forecast Center (APRFC), NCEP, the National Operational Hydrologic Remote Sensing Center (NOHRSC) and their SNOw Data Assimilation System (SNODAS), and the National Ice Center



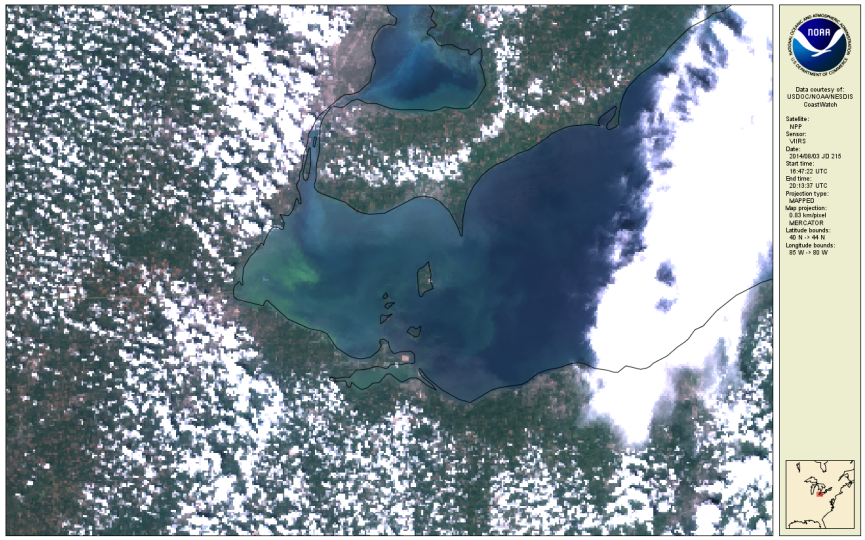
Land Data Assimilation

- Maximize the utilization of JPSS land surface environmental data products, as well as data products from other environmental satellites, by the NOAA numerical weather prediction community.
- Top priority is given to the utilization of Green Vegetation Fraction (GVF) and Land Surface Temperature (LST) from the S-NPP satellite and a suite of soil moisture products.
- Users: NWS/NCEP



VIIRS GVF difference (15 Aug 2012 minus 15 Aug 2014)

Oceans and Coastal

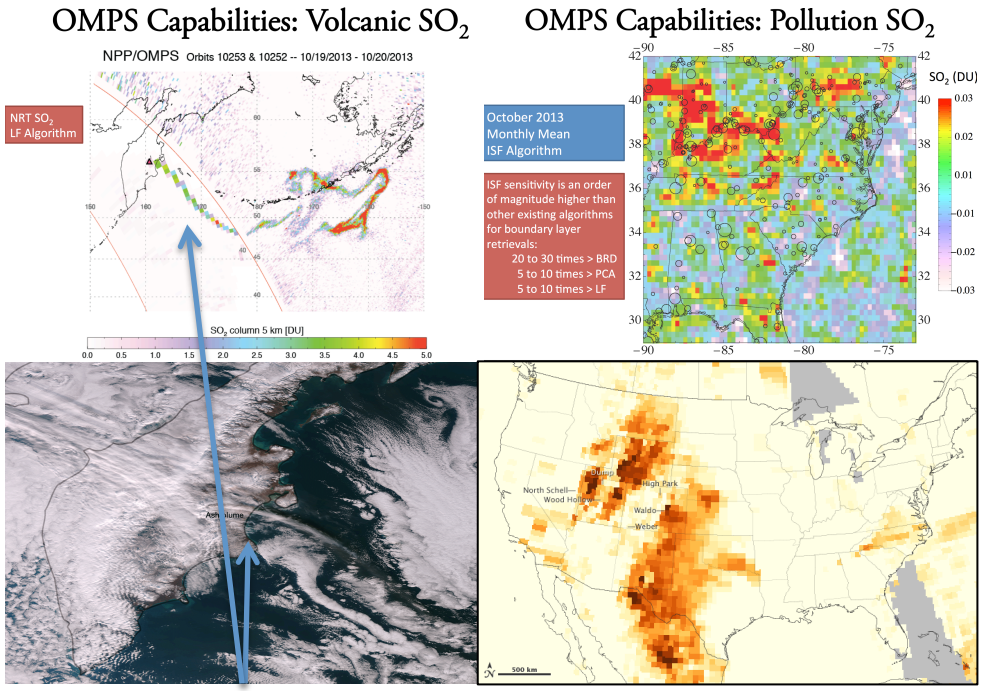


VIIRS coastal true color image of Lake Erie, August 3, 2014 depicting the large bloom of the cyanobacterium, Microcystis sp. threatened the water supply of Toledo, OH

- Support the activities that provide users with fit-for-purpose, accurate, consistent and timely ocean data and derived products from VIIRS.
- Focus on the following NOAA service areas: Modeling and Forecasting Physical & Biological Ocean and Coastal Dynamics, Harmful Algal Blooms (HABs), Water Quality, and Ecological Forecasting, Living Marine Resources, and Ocean Acidification and Air Quality

Atmospheric Chemistry

- Increase the utilization of the JPSS atmospheric chemistry products, including improved SO2 and aerosol products

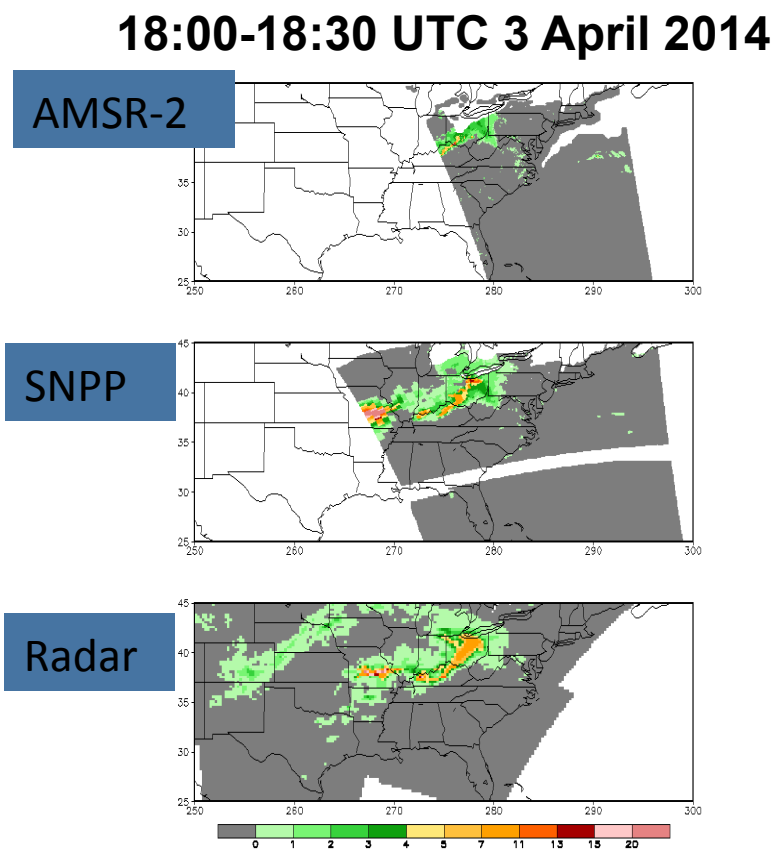


VIIRS sees the ash, but OMPS sees the SO2

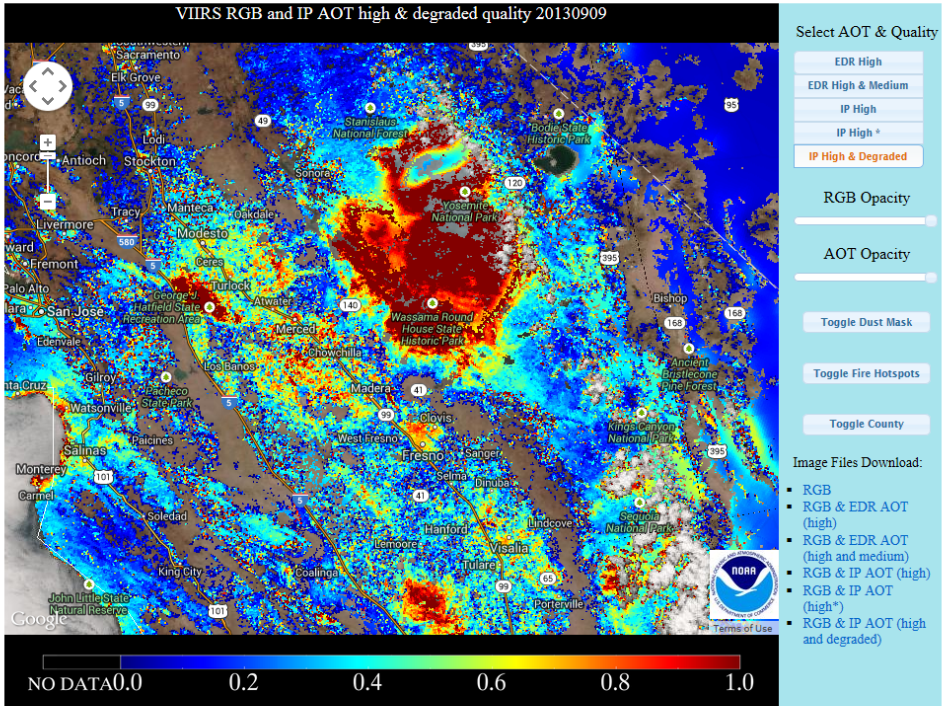
OMPS aerosols over generally bright surfaces from fires

Hydrology

- Use of S-NPP, JPSS, and GCOM precipitation products in areas such as
  - Synergistic use of VIIRS with ATMS or AMSR-2 to improve rainfall and snowfall retrieval
  - Regional algorithm development and application to exploit direct broadcast data
  - Extension of global climate hydrological products from POES/ AMSU to JPSS/ATMS
  - Improvements to precipitation retrievals under conditions of orographic forcing, where conventional retrieval algorithms are known to break down.



Aerosol Data Assimilation



- Improve the use of VIIRS and OMPS aerosol products in operational models at NWP centers or developmental models at partner agencies that have defined pathways to transition to NWP centers.
- Make use and demonstrate the value of VIIRS aerosol optical depth, aerosol (smoke, dust, volcanic ash) detection, and OMPS UV Aerosol Index products in improving forecasts.

Innovation

- Looking for “out-of-the-box” ideas and concepts that keep science fresh
- Can include new applications of existing products or development of new algorithms or products

Training

- Focus on improving the utilization of JPSS products and applications by the user community
- Also supports education and training of the next generation of scientists

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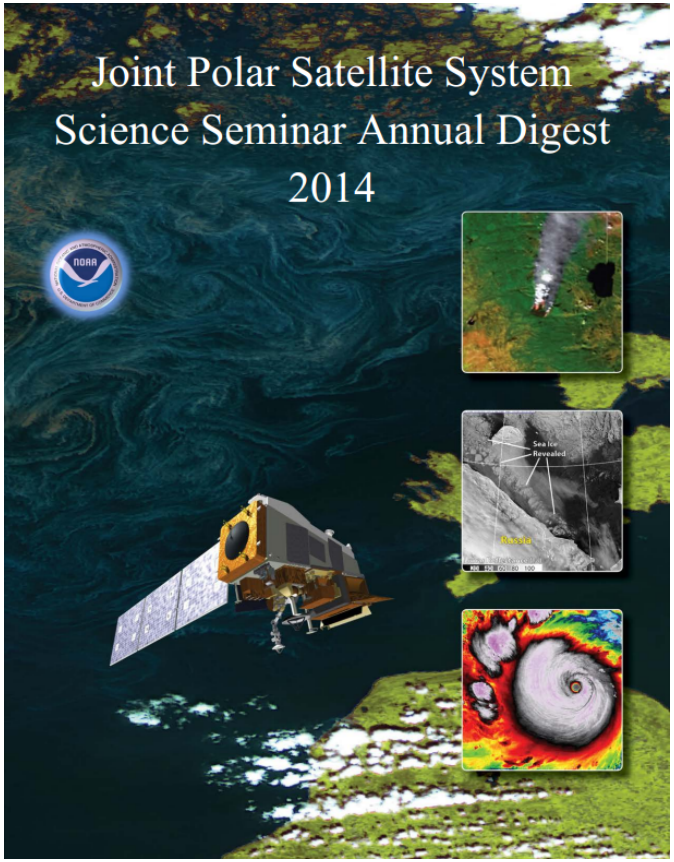
Want to learn more?

- 2013 and 2014 Annual Science Digests are available
- Join our monthly JPSS Science Seminars http://www.jpss.noaa.gov/science-seminars.html
- Check out the JPSS Website http://www.jpss.noaa.gov/science.html



Thank you!