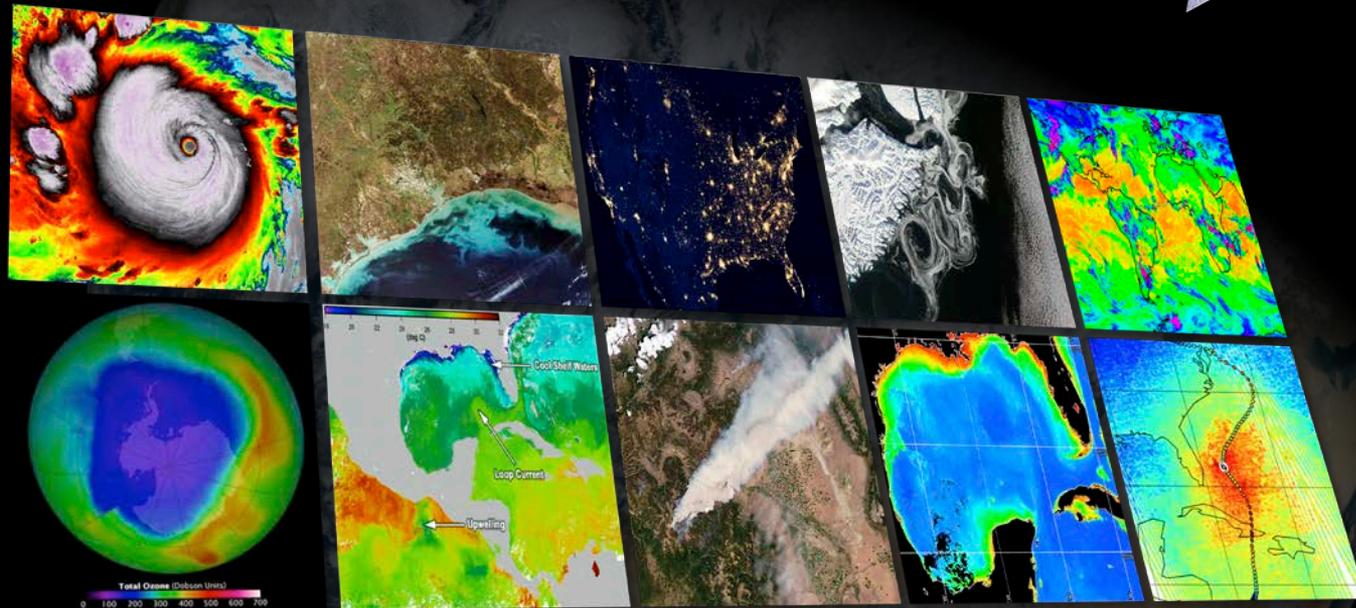
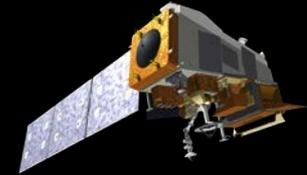
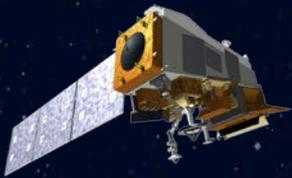


# Joint Polar Satellite System (JPSS)



John Furgerson, User Liaison  
Joint Polar Satellite System  
National Environmental Satellite, Data, and Information Service  
National Oceanic and Atmospheric Administration  
July 15, 2014

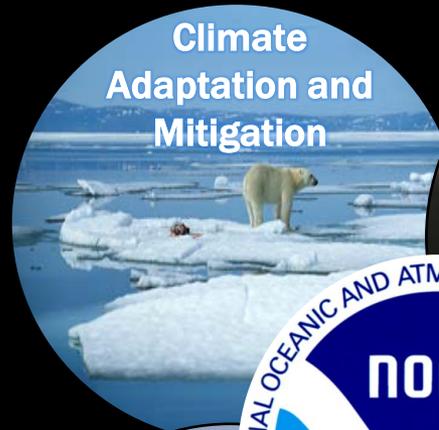


# How JPSS Advances Weather Forecasting & Climate Monitoring



## JPSS supports all four key NOAA mission areas

Improved understanding of a **changing climate system** that informs science, service, and stewardship



**Weather Ready Nation**



Reduced loss of life from **high-impact weather events** while improving efficient economies through environmental information

Improved coastal water quality support that enables coastal communities to effectively manage resources and improve resiliency

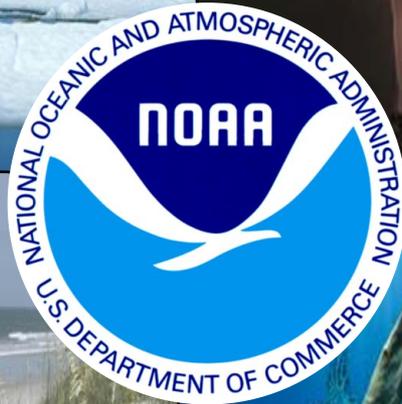


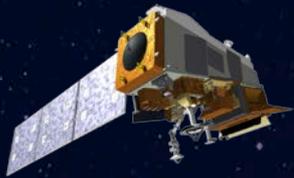
**Resilient Coastal Communities and Economies**



**Healthy Oceans**

Improved understanding of ecosystems to inform resource management decisions





# JPSS Overview



- JPSS is the next generation of U.S. civil operational polar-orbiting satellites. The JPSS program is a partnership between NOAA and NASA, including agreements with EUMETSAT, JAXA and DoD.
- Polar satellites, like JPSS, are critical for forecasts beyond 48 hours and increase the accuracy of forecasts three to seven days in advance of a severe weather event.
- JPSS represents significant technological and scientific advances in environmental monitoring and helps advance weather forecasting, environmental assessments and climate monitoring.
- JPSS provides operational continuity of satellite-based observations and products beyond NOAA Polar-orbiting satellites and NASA Earth-observing satellites.



# The JPSS Enterprise



## JPSS consists of:

- Suomi NPP\* satellite, JPSS-1 satellite, and JPSS-2 satellite
- Four primary instruments
- Global ground system (Alaska, Colorado, Maryland, West Virginia, Norway, Antarctica)

## NOAA Responsibilities:

- End-to-end responsibility, requirements, funding, delivering to National Weather Service
- Operations, data product science, enterprise ground services

## NASA Goddard Space Flight Center Responsibilities:

- Systems Engineering lead
- Procurement and acquisition
- Safety and Mission Assurance

JPSS Schedule	
Launch Dates*	No later than 2nd Quarter FY 2017 (JPSS-1); 1st Quarter FY 2022 (JPSS-2)
Program Architecture	3 Satellites (Suomi NPP, JPSS-1, JPSS-2) Suomi NPP: 5-year operational design life; JPSS-1: 7-year operational design life
Program Operational Life	FY 2012 - FY 2025
Program Life-cycle (FY 2014 President's Budget)	\$11.349 billion

\*Suomi-NPP is a joint NASA / NOAA mission

\*Launch Date based on FY 2014 President's Budget Request



# Why JPSS?



JPSS provides continuity of Earth's key observations, including oceans, clouds, ozone, snow, ice, vegetation and atmosphere—ensuring a continuous series of global weather data. Data from JPSS instruments provide more than 30 years of consistent observations that have allowed scientists to monitor the climate.

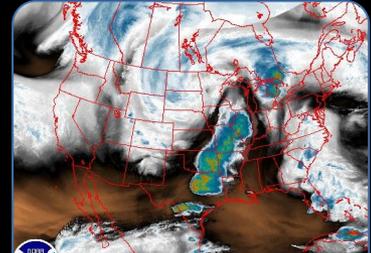
The two most important uses:

- *JPSS provides the most critical data for numerical weather prediction to ensure accurate forecasts 3-7 days ahead of a significant weather event, giving high confidence to emergency managers and decision makers*
- *Operational weather and environment satellite observations for Alaska and Polar Regions operational forecasting*

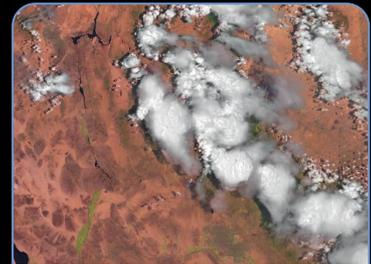
NOAA's environmental satellites are the backbone of life-saving weather forecasts and advance hazardous outlooks. There is no substitute for the role they play in the U.S. and around the world.

In the last three years, the U.S. experienced more than 30 disasters surpassing \$1Billion. The demand for these products has never been greater.

Without JPSS, the Nation will experience an immediate degradation in weather forecasting capability



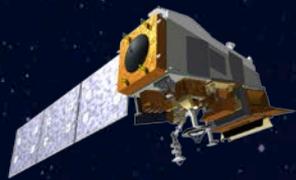
EF-5 tornado in Moore, Okla. (2013)



Yarnell Hill fire in Prescott, Ariz. (2013)



Hurricane Sandy in Atlantic City, N.J. (2012)

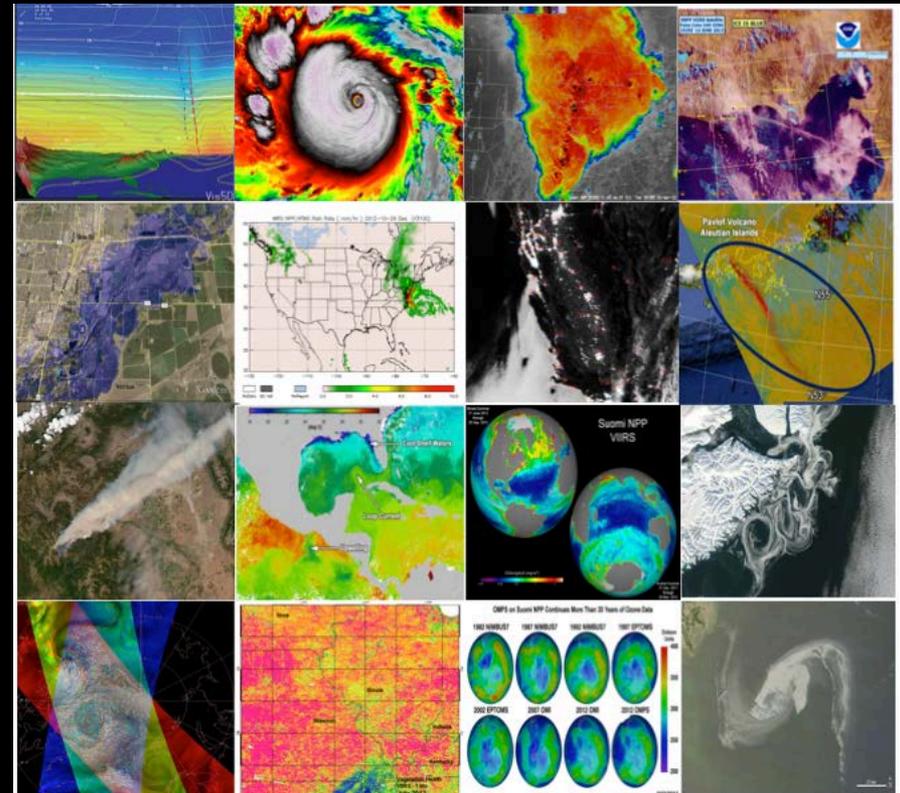


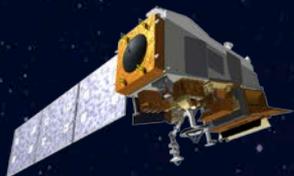
# JPSS Observes A Variety of Weather & Climate Events



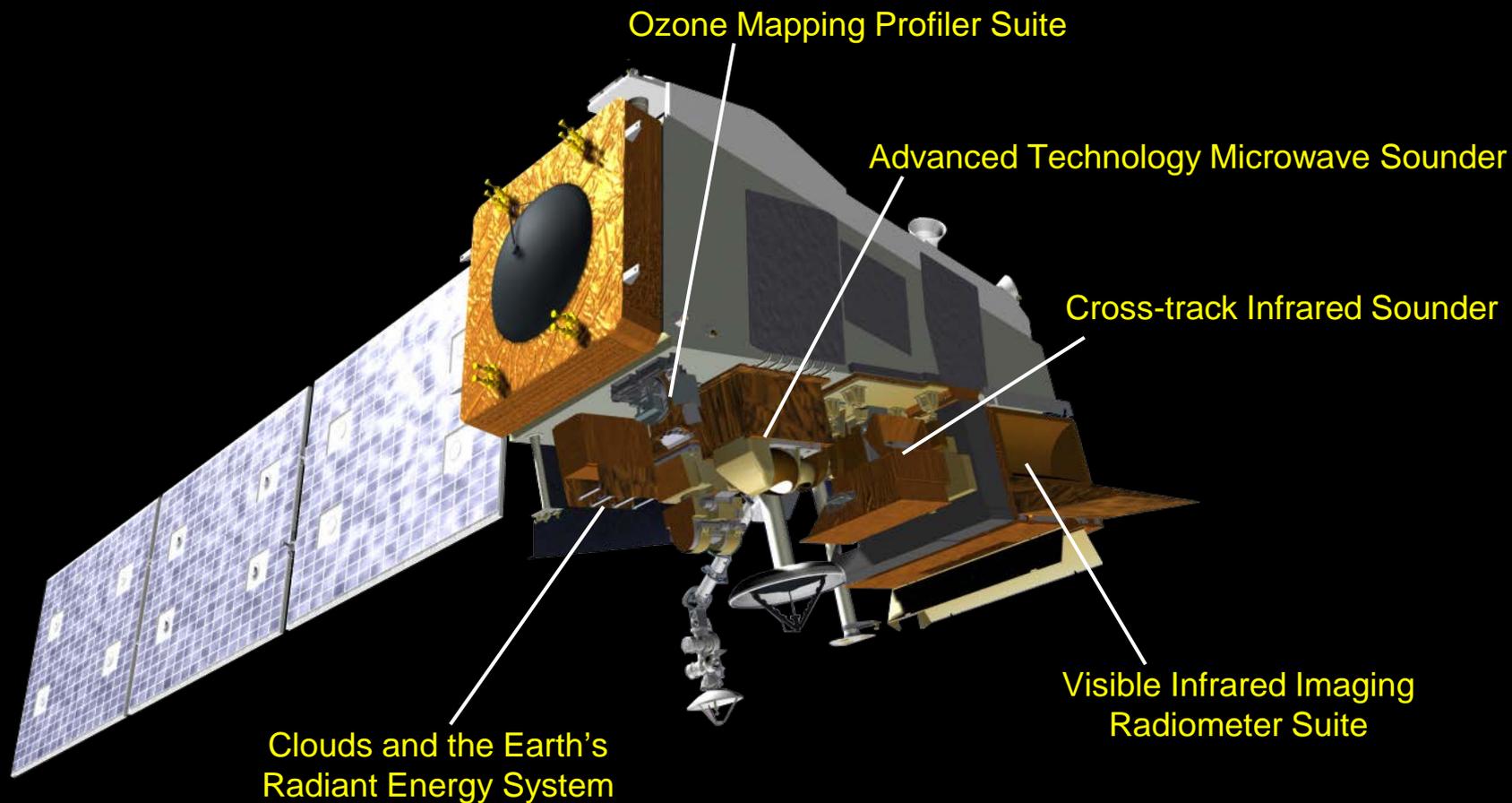
## Enhanced data products include:

- Drought
- Ozone
- Atmospheric temperature/moisture profiles
- Hurricane intensity and position
- Thunderstorms, tornado potential
- Alaska “nowcasting” (e.g. ice detection)
- Significant precipitation and floods
- Dense fog
- Volcanic ash
- Fire and smoke
- Sea surface temperature, ocean color
- Sea ice extent and snow cover /depth
- Polar satellite derived winds (speed/direction/height)
- Vegetation greenness indices and health





# JPSS Spacecraft

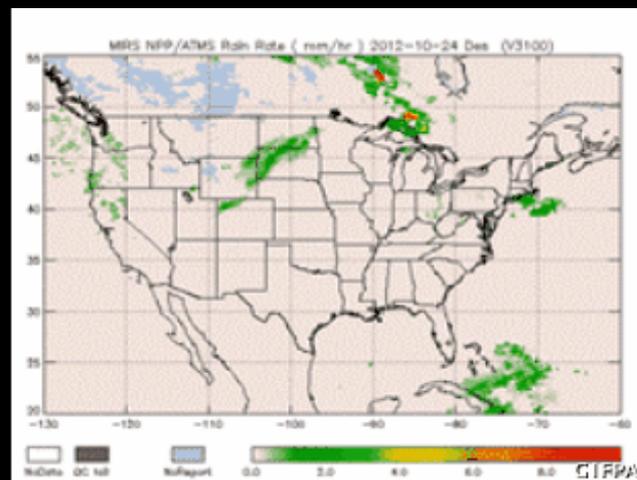
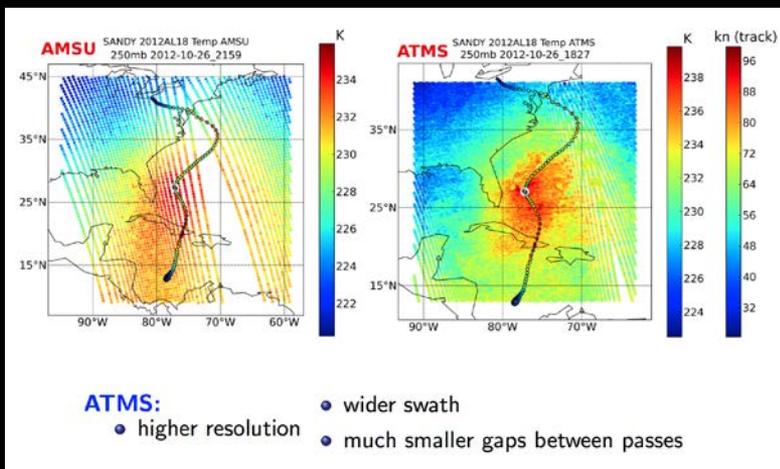
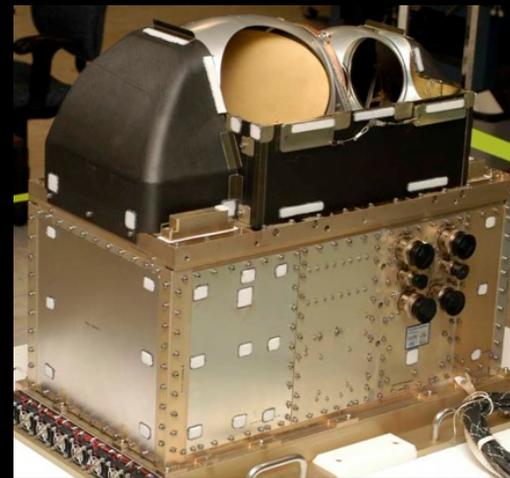




# Advance Technology Microwave Sounder (ATMS)



ATMS offers more channels, better resolution and a wider swath than previous legacy microwave instruments. This improves the accuracy of short- and medium-term forecasting, storm tracking and, with continued measurements over time, climate prediction models. It helps collect essential data for accurate near-term weather predictions needed for farming, commercial and defense aircraft flight path planning, terrestrial extreme weather preparedness and oceanographic inputs for civilian and defense ships. ATMS measurements also provide rainfall rates, snow and ice information.

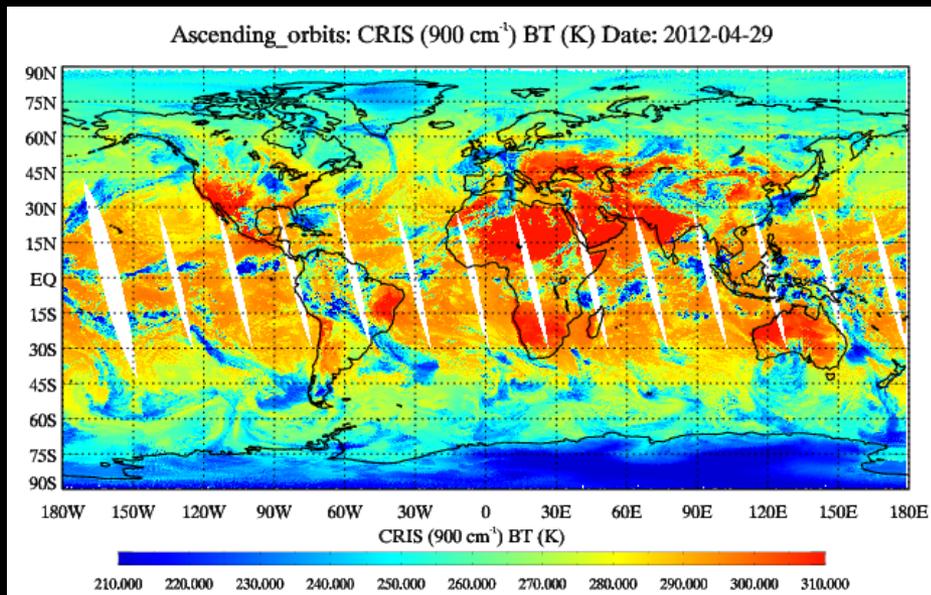




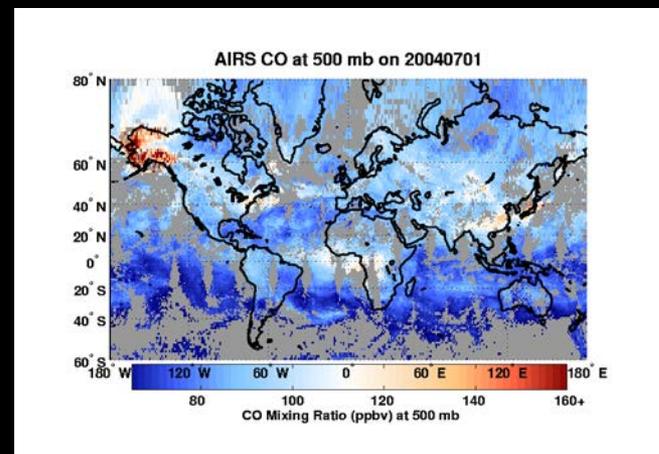
# Cross-track Infrared Sounder (CrIS)



The CrIS is the first in a series of advanced operational sounders that provides more accurate, detailed atmospheric temperature and moisture observations for weather and climate applications. CrIS provides temperature and moisture profiles with 6x more vertical resolving power than previous NOAA infrared sounders. A single hyperspectral IR sounder provides the largest improvement to the forecast skill than any other instrument.



CrIS long-wave surface temperature channel

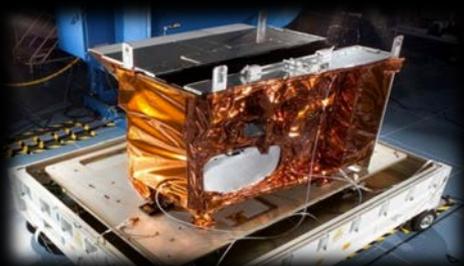
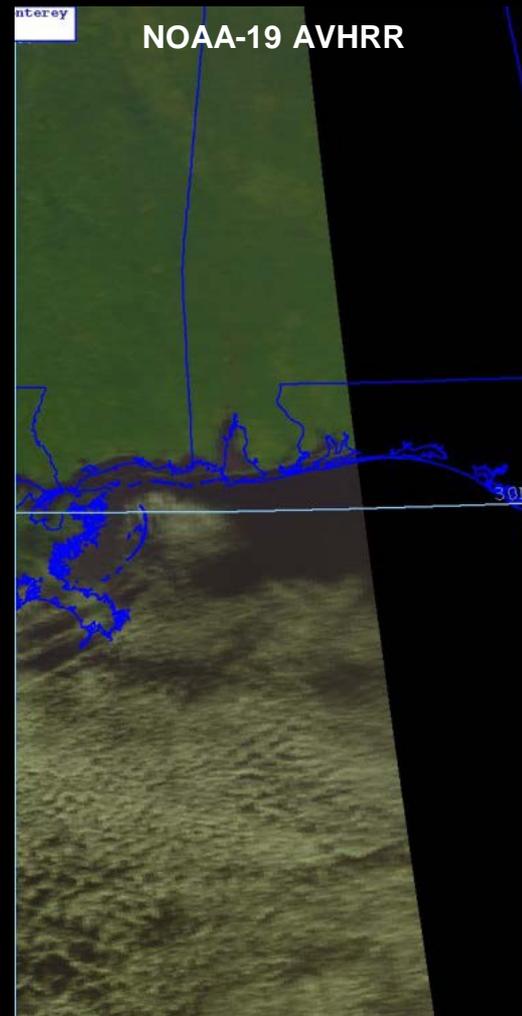
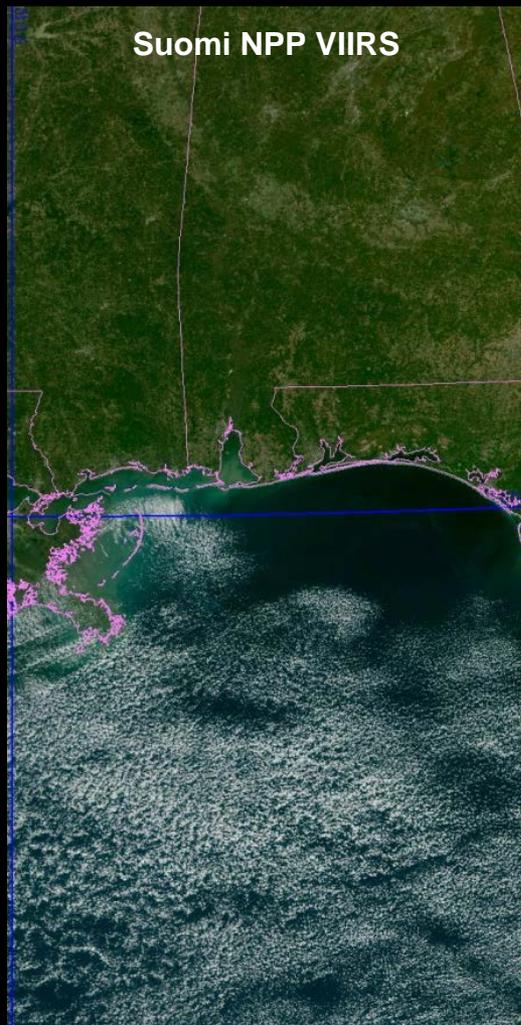




# Visible Infrared Imaging Radiometer Suite (VIIRS)



VIIRS collects visible and infrared imagery and global observations of land, atmosphere and cryosphere. It offers more spectral bands, higher resolution, and greater accuracy resulting in the largest number of products to include land and sea surface temperatures, clouds, fire, smoke, snow, ice, vegetation, and ocean chlorophyll. VIIRS is a major advancement over AVHRR, which degraded spatial resolution. VIIRS generates products for operational weather community that improves weather, flooding and storm forecasting abilities, which help to protect life and property.

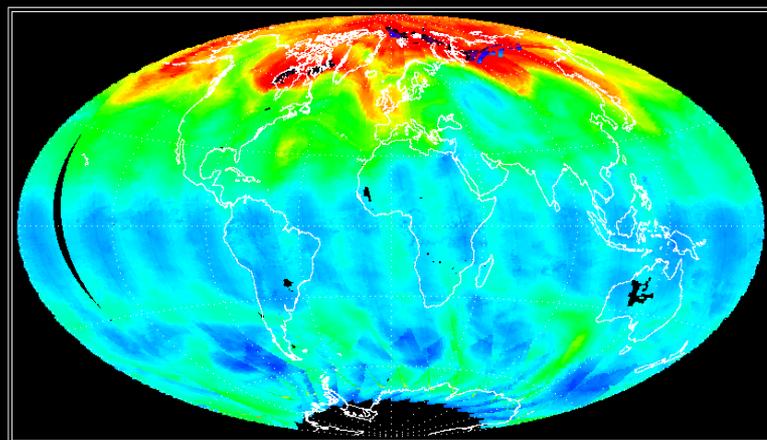




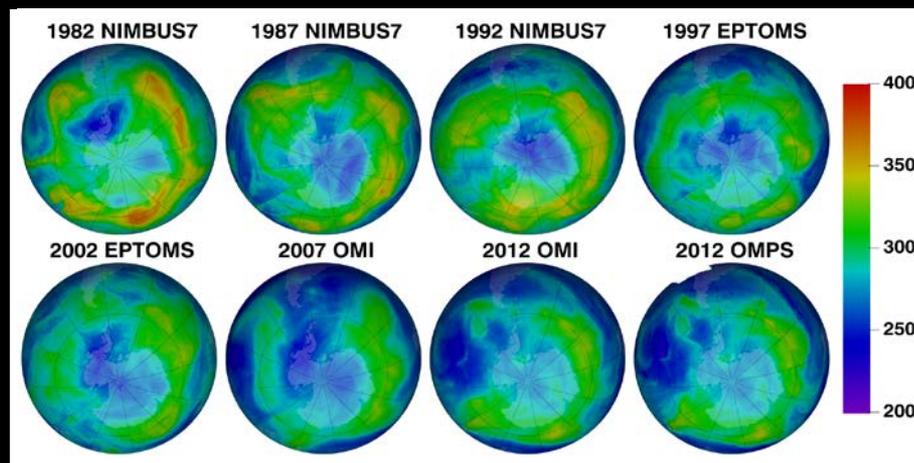
# Ozone Mapping and Profiler Suite (OMPS)



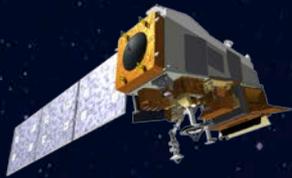
OMPS tracks the health of the ozone layer and measures the concentration of ozone in the Earth's atmosphere. Data from OMPS continues three decades of total ozone and ozone profile records, which fulfill the U.S. treaty obligation to monitor ozone concentrations for the Montreal Protocol. This important data is used by ozone assessment researchers and policy makers to create global climate models.



Total Ozone for APR 18, 2012



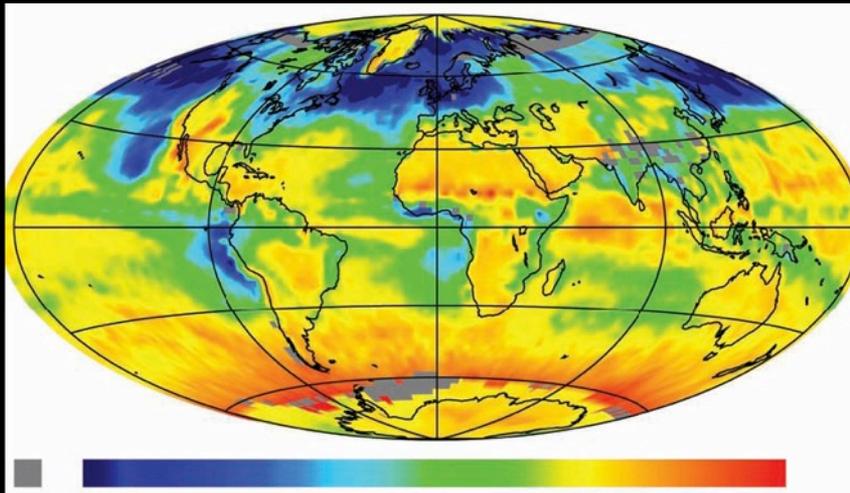
Credit: NOAA/NASA

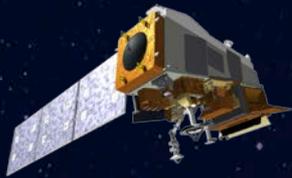


# Clouds and the Earth's Radiant Energy System (CERES)



CERES measures reflected sunlight and thermal radiation emitted by the Earth and helps provide measurements of the spatial and temporal distribution of Earth's Radiation Budget (ERB) components. Measurements from CERES help scientists understand the links between the Earth's incoming and outgoing energy and the properties of the atmosphere that affect that energy. The observations from CERES FM6 help measure the effect of clouds on the energy balance, which strongly influences both weather and climate.





# JPSS Program Status



## Suomi NPP is producing outstanding data

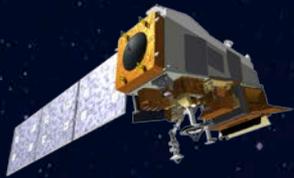
- The satellite is healthy and producing a high availability of data (~99.99%)
- Operations of the satellite transferred from NASA to NOAA in 2013
- Suomi NPP is the primary operational polar-orbiting satellite for NOAA

## JPSS-1 is executing as planned

- Instruments and spacecraft are proceeding well
- Instruments are assembled and undergoing testing; two have been delivered for integration
- The spacecraft bus is built and undergoing testing
- Development and implementation of the new ground data processing system are underway

## JPSS-2 procurement activities are progressing well

- The VIIRS sensor is under contract and others are in evaluation
- The spacecraft bus procurement is underway



# Conclusion



- Current suite of instruments on Suomi NPP will be flown on JPSS-1 satellite mission and offer significant improvements in observational capability from the legacy POES satellite series and continue EOS research capabilities.
- The JPSS mission is critical to provide the U.S. and international community with operational continuity of key weather and climate observations established by NOAA and NASA.
- The NOAA satellite climate data records from 1970s will be continued by JPSS.
- JPSS is on track, on budget and schedule for upcoming JPSS-1 satellite mission in early 2017.



# NOAA Satellite Conference 2015



- For Direct Readout, GOES/POES, and GOES-R/JPSS Users
- April 27 – May 1, 2015
- Location: Greenbelt Marriott Hotel in Greenbelt, Maryland, USA