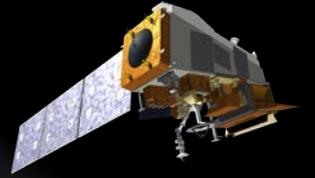
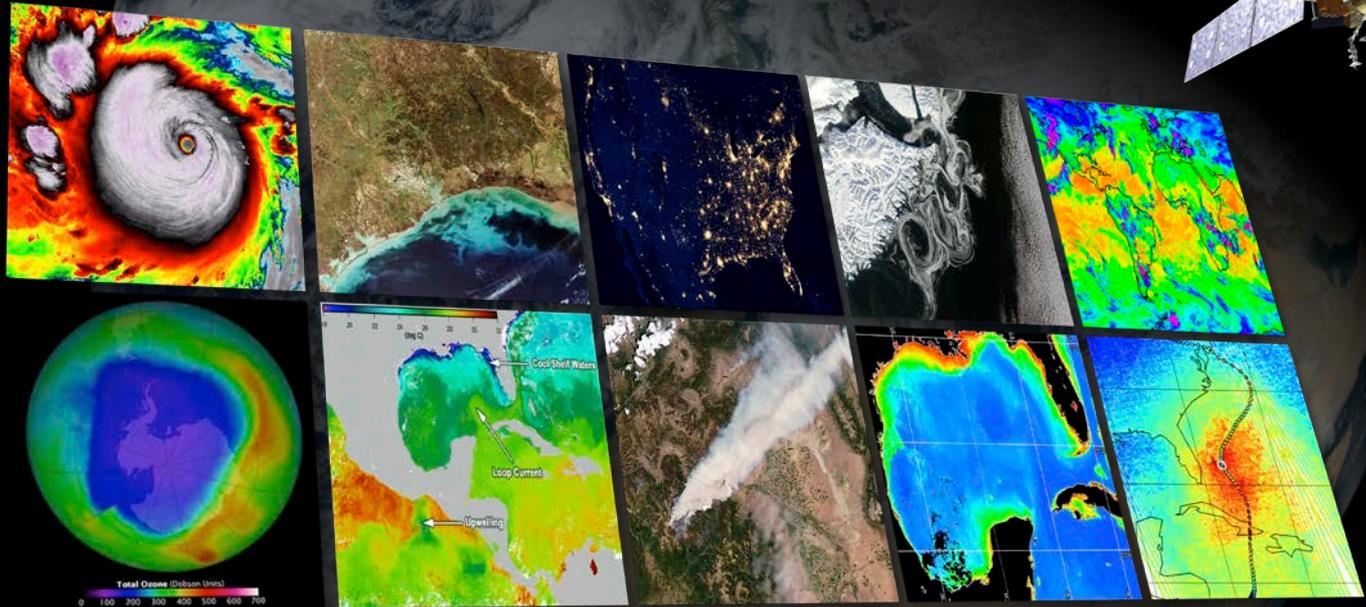
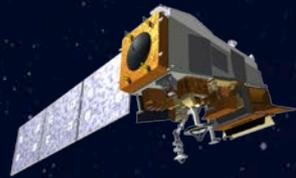


Joint Polar Satellite System: The United States Next Generation Civilian Polar Orbiting Environmental Satellite System



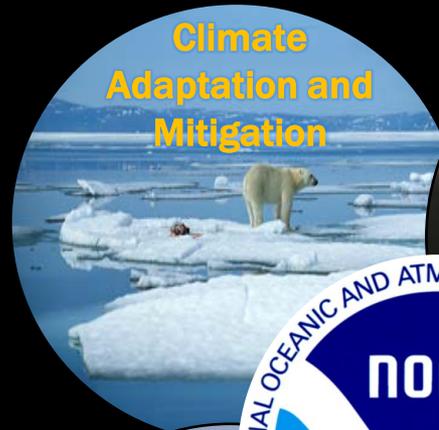
Harry Cikanek, Director
Joint Polar Satellite System
National Environmental Satellite, Data, and Information Service
National Oceanic and Atmospheric Administration
January 6, 2015



JPSS Supports all NOAA Mission Areas



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



Climate Adaptation and Mitigation



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



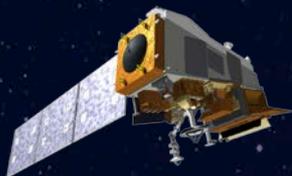
Resilient Coastal Communities and Economies



Healthy Oceans

Improved understanding of ecosystems to inform resource management decisions





The JPSS Program



JPSS consists of:

- NOAA/NASA Suomi NPP satellite, JPSS-1 satellite, and JPSS-2 satellite
- Four primary weather instruments, hosts one additional instrument
- Global ground system (Alaska, Colorado, Maryland, West Virginia, Norway, Antarctica)

NOAA Responsibilities:

- Requirements, funding, delivering data to the NWS and others
- Operations, data product science, enterprise ground elements

NASA Responsibilities:

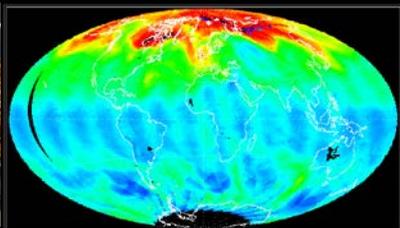
- Systems Engineering lead
- Flight and majority of Ground acquisition
- Safety and Mission Assurance

International Partnerships:

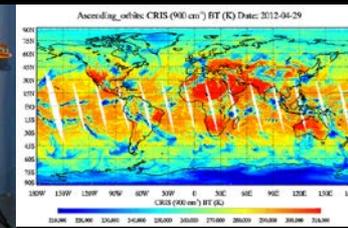
- EUMETSAT
- JAXA

JPSS Schedule	
Launch Dates	No later than 2nd Quarter FY 2017 (JPSS-1); Target 4th Quarter FY 2021 (JPSS-2)
Program Architecture	3 Satellites (NOAA/NASA Suomi NPP, JPSS-1, JPSS-2) Suomi NPP: 5-year design life; JPSS-1, 2: 7-year design life
Program Duration	FY 2011 - FY 2025

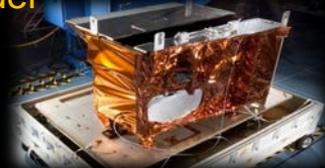
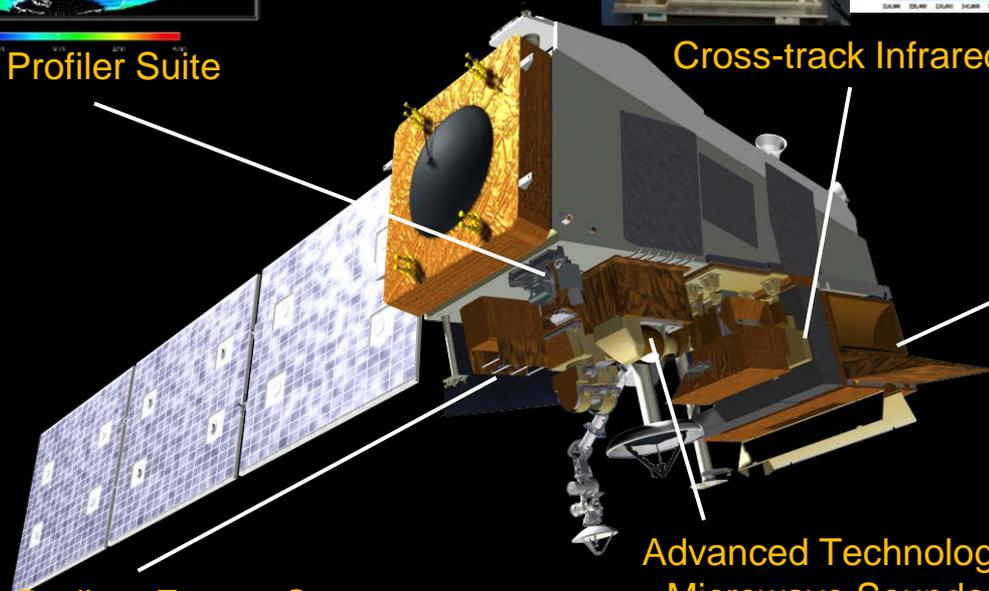
JPSS-1 Spacecraft



Ozone Mapping and Profiler Suite



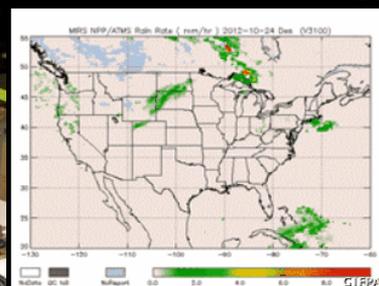
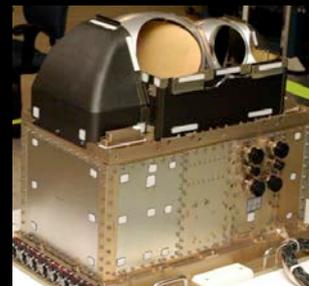
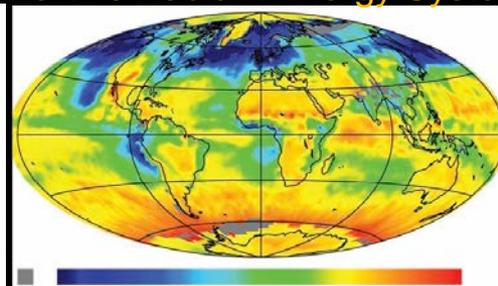
Cross-track Infrared Sounder



Advanced Technology Microwave Sounder

Visible Infrared Imaging Radiometer Suite

Cloud and the Earth's Radiant Energy System



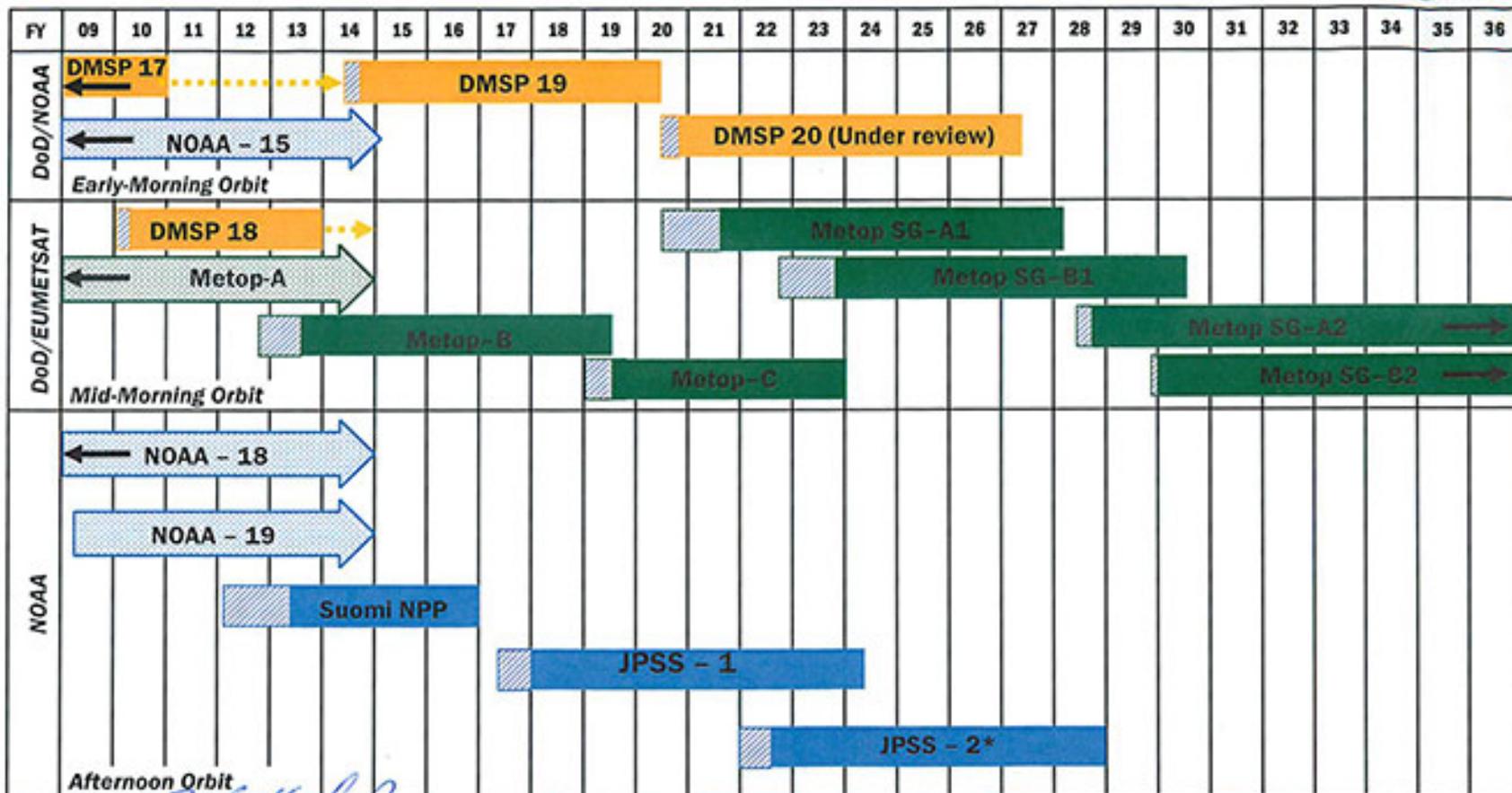


NOAA & Partner Polar Weather Satellite Programs

Continuity of Weather Observations



As of August 2014



Approved: 
 Assistant Administrator for Satellite and Information Services

* Follow-on funding required for operations in FY 2025 and beyond.
 Note: Extended and secondary mission life extension predictions will be updated in early FY 2015

DMSP: Defense Meteorological Satellite Program		Post Launch Test
JPSS: Joint Polar Satellite Program		Operational based on design life
Suomi NPP: Suomi National Polar-orbiting Partnership		Secondary Status
Metop SG: Metop Second Generation		Operational beyond FY 2036
		In Extended Mission
		Launched before Oct 2008



Why JPSS?



- Critical for the accuracy of forecasts **three to seven days in advance of a severe weather event.**
- Significant technological and scientific advances enabling better weather forecasting and monitoring.
- Continuity of key global observations of the Earth's atmosphere, oceans, land, and cryosphere—follow-on for the NOAA Polar-orbiting Operational Environmental Satellites (POES) and NASA Earth-observing satellites (EOS).
- NOAA's Polar and Geostationary 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.



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



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



Yarnell Hill fire in Prescott, Ariz. (2013)

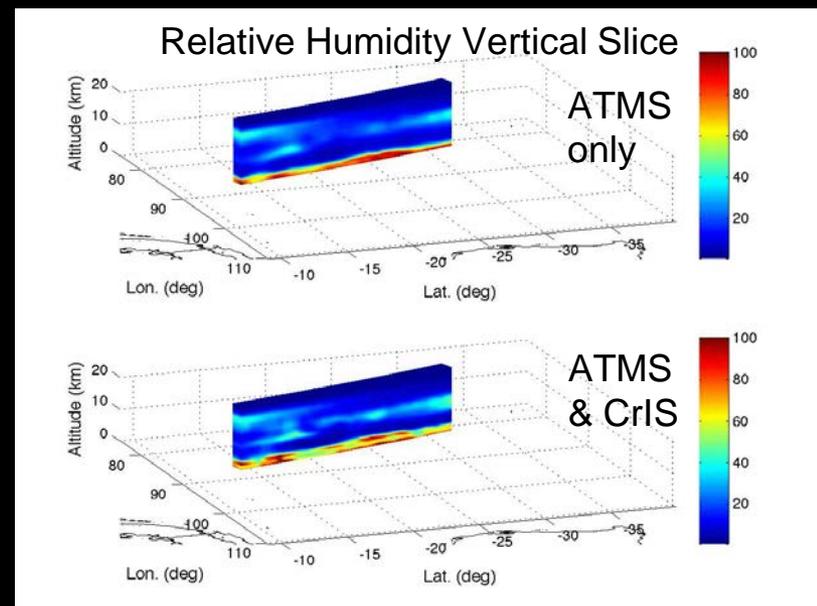
Without JPSS, the Nation will experience an immediate degradation in weather forecasting capability



Program Status Suomi-NPP



- Launched on October 28, 2011, bridge from legacy POES/EOS to JPSS
- 3rd Anniversary On October 28, 2014,
- In three years - 15,550 orbits, more than 31.719 petabytes of data = to 266,076,160 (16GB) smartphones.
- Observations are exceeding expectation with high data availability.
- **Named NOAA's primary polar-orbiting weather satellite on May 1, 2014**



This animation depicts vertical resolution enhancement by using CrIS with ATMS



Program Status

JPSS-1



CERES being attached to JPSS-1 spacecraft
Courtesy of Ball Aerospace



OMPS integration
Courtesy of Ball Aerospace



VIIRS Out of TVAC
Courtesy of Raytheon Co.



CrIS Out of TVAC
Courtesy of Exelis



Program Status

JPSS-2, Ground, Science



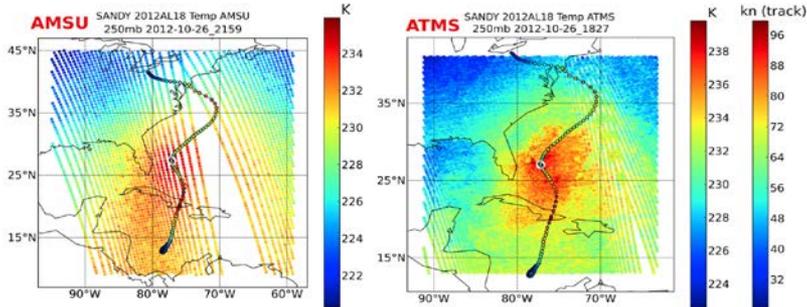
- JPSS -2 Instruments under contract, spacecraft in procurement
- Block 2.0 Ground Deployed, in Integration, Test, Verification – TTO early 2016
 - Multi-Mission
 - Technology Refresh
 - Security
 - Efficient flexible operations
- Significant Block 1 updates operating well
- User readiness / risk reduction progress
- Plan beyond JPSS-2 submitted
- Joint Polar System Agreement with EUMETSAT approved



ATMS and AMSR2 Status

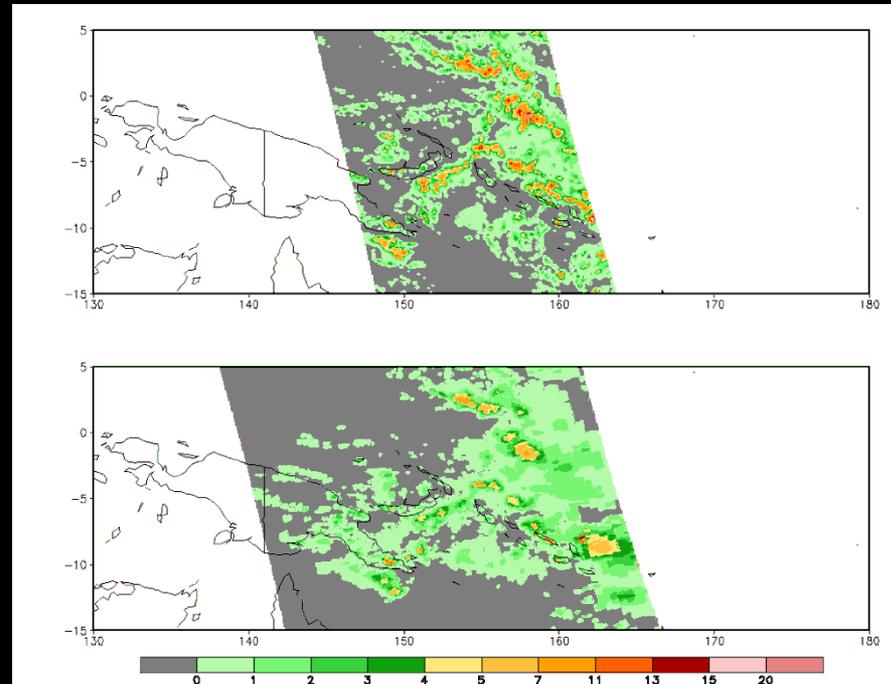


Resolution: ATMS vs AMSU

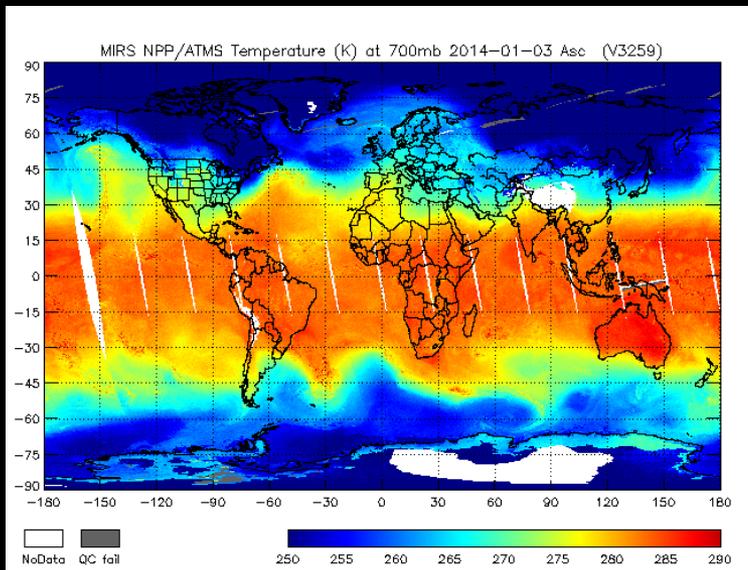


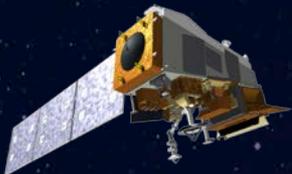
- ATMS:**
- higher resolution
 - wider swath
 - much smaller gaps between passes

Comparisons between AMSR2 And ATMS precipitation



ATMS provides wide coverage, and AMSR-2 provides higher spatial resolution



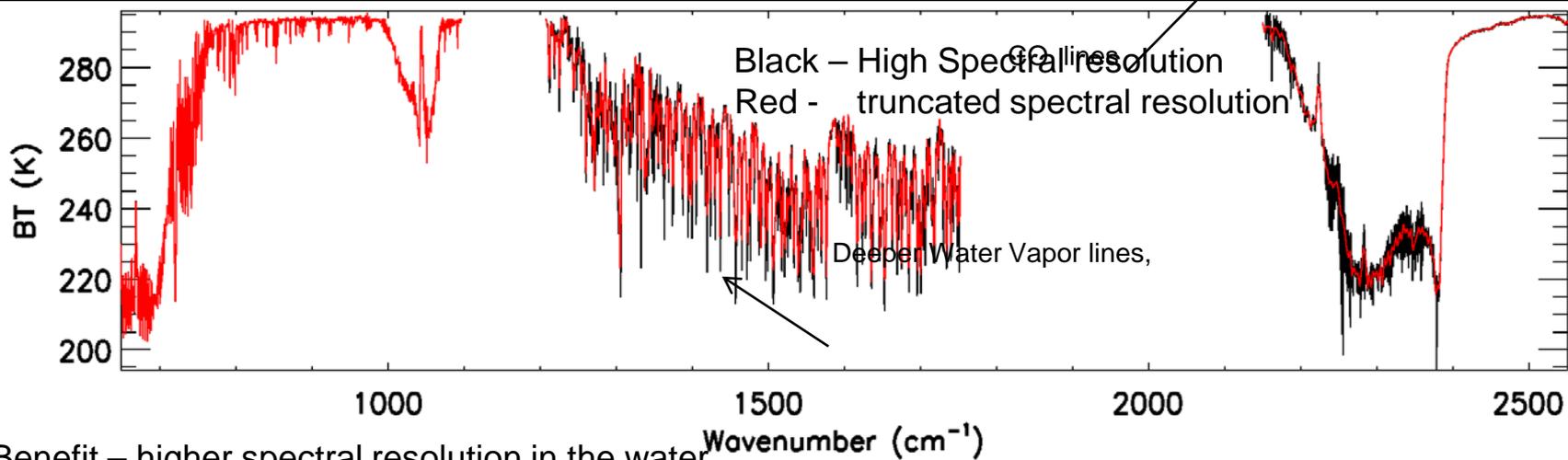


CrIS Status

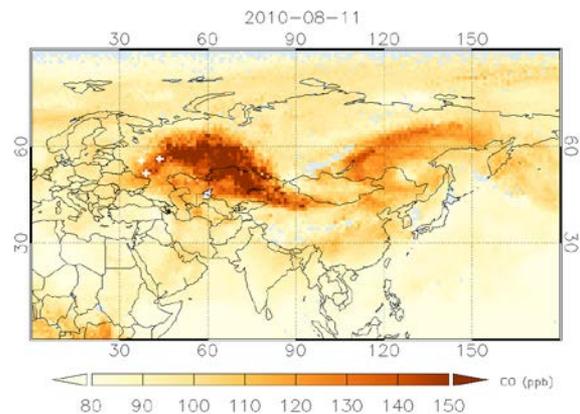


CriS Full Spectral Resolution is now here!!

On 12/4/15 – full interferograms are now being transmitted from the SNPP instead of them being truncated on the spacecraft

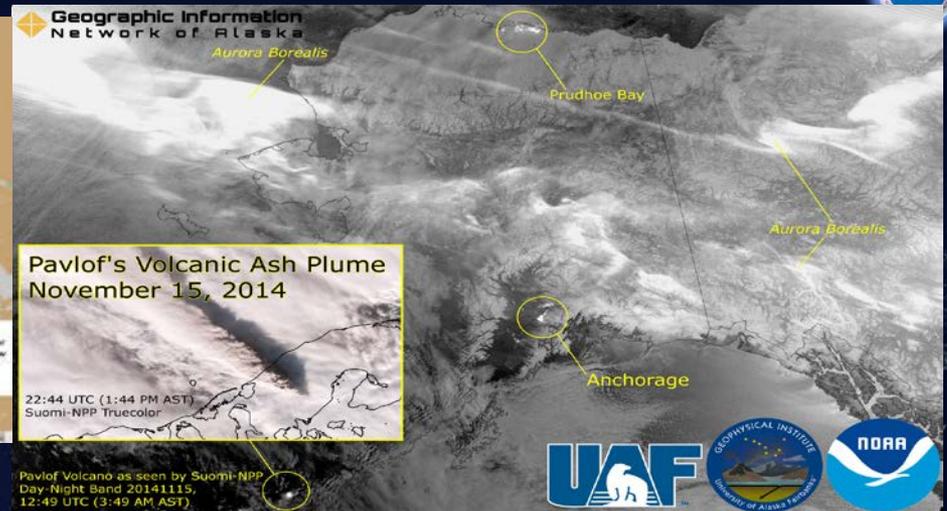
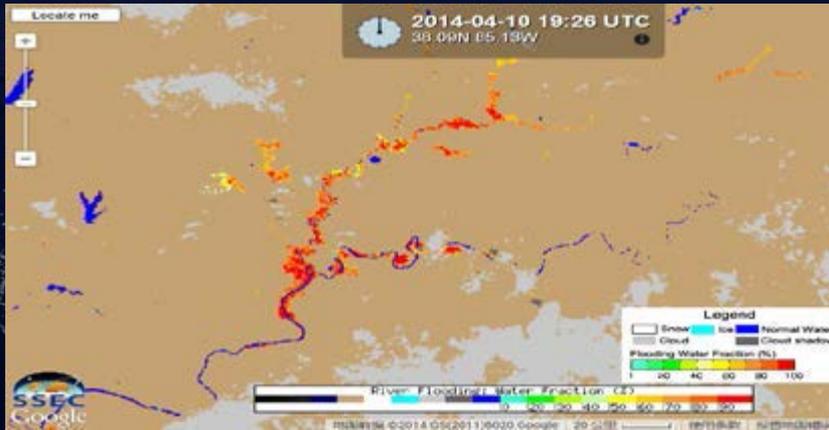


AIRS CO for 2010 Russian Fire,
CRIS CO will have the same performance



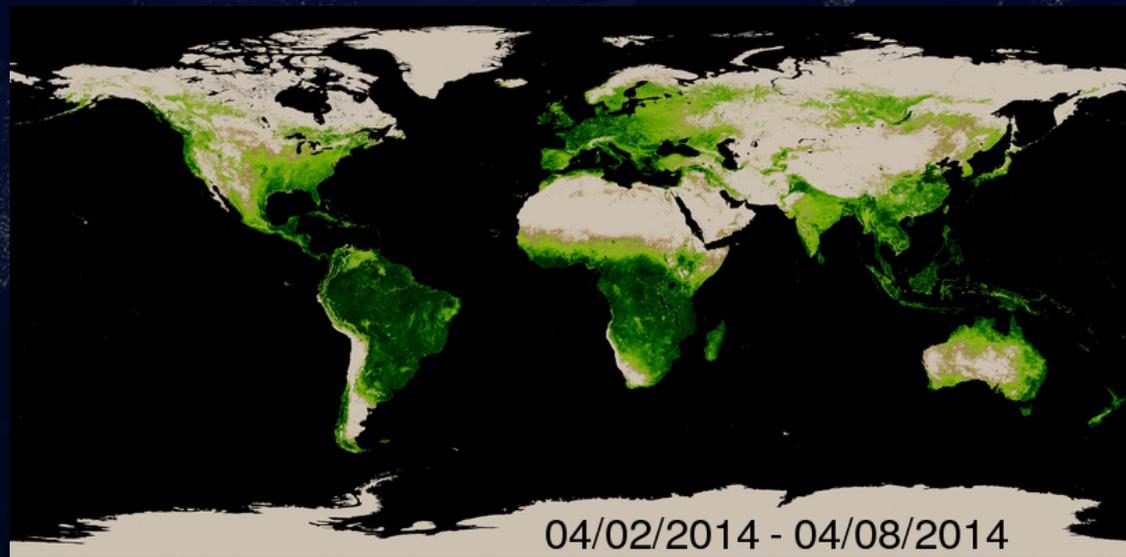


VIIRS Status



VIIRS offers more spectral bands, higher resolution, wider swath and greater accuracy, resulting in a large number of products.

11.45 μm



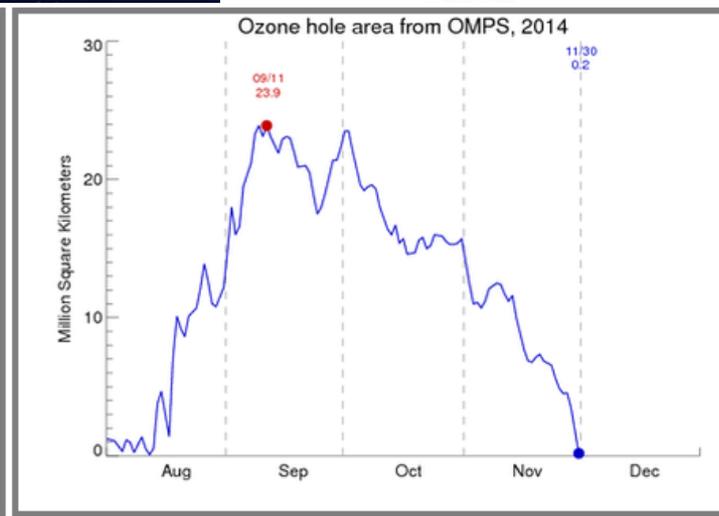
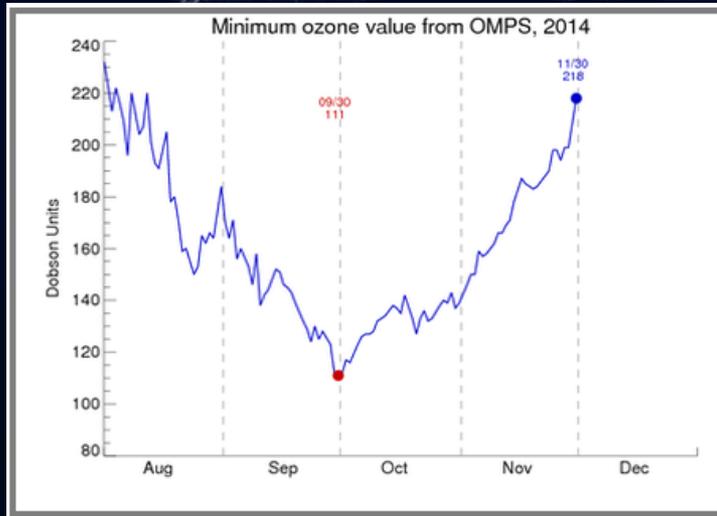
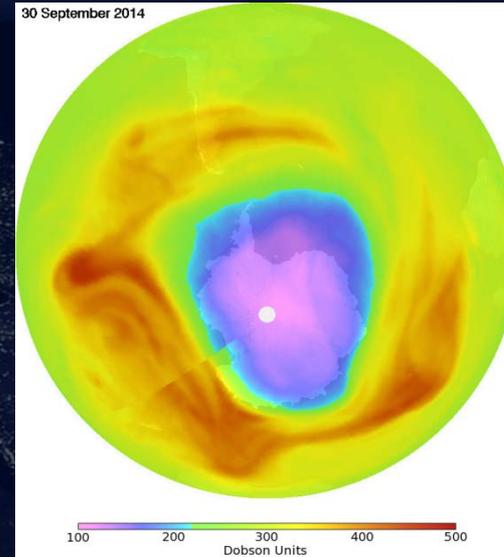
Vegetation Fraction

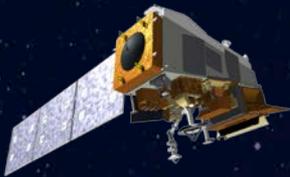


OMPS Status



- OMPS spatial resolution will increase for JPSS-1 (2017) based on requests from users monitoring volcanic ash and SO₂ plumes (USGS and NOAA and CEOS/CGMS/WMO)
- OMPS aerosols better than VIIRS over bright scenes





SNPP Algorithm Maturity Status

DEC 2014 vs. DEC 2013



Products		Status Dec-13	Status Dec-14
SDR	ATMS	Validated	Validated
	CrIS	Validated	Validated
	VIIRS	Validated	Validated
	OMPS	Provisional	Validated
EDR	Imagery (non-NCC)	Provisional	Validated
	Imagery NCC	Provisional	Validated
	VIIRS Cloud Mask	Validated	Validated
	Cloud Properties (CLAVR-x)	Beta	*
	Aerosol Optical Thickness	Provisional	Validated
	Aerosol Particle Size Parameter	Provisional	Validated
	Suspended Matter	Beta	Beta
	Active Fires	Provisional	Validated
	Land Surface Temperature	Provisional	Validated
	Surface Type	Beta	Validated
	Surface Albedo	Beta	Validated
	Vegetation Indices	Provisional	Validated
	Surface Reflectance IP	Provisional	Validated
	Ocean Color / Chlorophyll	Beta	Provisional
	Sea Surface Temperature (APSCO)	Beta	Validated
	Ice Surface Temperature	Provisional	Validated
	Sea Ice Characterization	Provisional	Validated
	Snow Cover - Binary Mask	Provisional	Validated
	Snow Cover - Fraction	Provisional	Provisional
	Sounding (NUCAPS)	Provisional	Validated
OMPS Ozone EDR	Provisional	Validated	
		Beta	Provisional
		Validated	Validated

<http://www.star.nesdis.noaa.gov/jpss/DataMaturity.php>

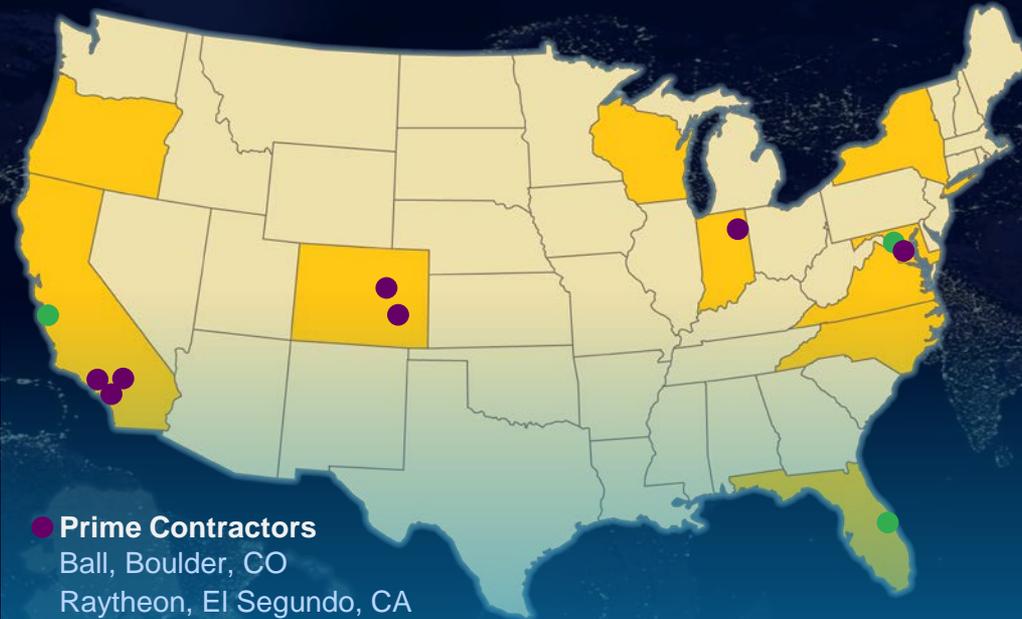
* Except CCL & Nighttime COT



JPSS Across the Country



Prime Contractors and Federal Partners



● Prime Contractors

- Ball, Boulder, CO
- Raytheon, El Segundo, CA
- Exelis, Ft. Wayne, IN
- Northrop Grumman Electronic Systems, Azusa, CA
- Northrop Grumman Aerospace Systems, Redondo Beach, CA
- Aerospace Corporation, El Segundo CA, Washington D.C.
- Raytheon, Aurora, CO

● Government Partners/Locations

- NASA, Cocoa Beach, FL
- NASA, Greenbelt, MD
- NOAA, Greenbelt, Suitland, Silver Spring, College Park, MD
- Naval Research Laboratory, Monterey, CA



JPSS Across the Country

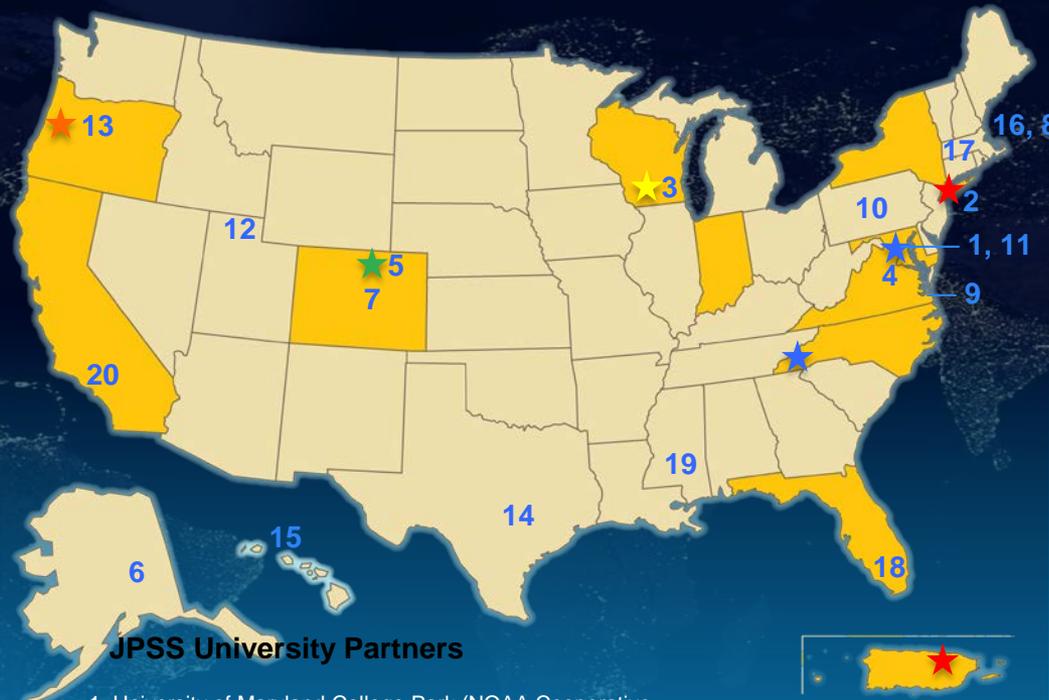


Academic Community

★ **Cooperative Institute for Oceanographic Satellite Studies (CIOS)**
Oregon State University
Corvallis, OR

★ **Regional and Mesoscale Meteorology Branch (RAMMB) and the Cooperative Institute for Research in the Atmosphere (CIRA)**
Colorado State University
Ft. Collins, CO

★ **Advanced Satellite Products Branch (ASPB) & the Cooperative Institute for Meteorological Satellite Studies (CIMSS)**
University of Wisconsin
Madison, WI

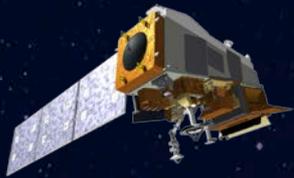


- JPSS University Partners**
1. University of Maryland College Park (NOAA Cooperative Institute)
 2. City College New York
 3. University of Wisconsin (NOAA Cooperative Institute)
 4. George Mason University
 5. Colorado State University (NOAA Cooperative Institute)
 6. University of Alaska at Fairbanks
 7. University of Colorado (NOAA Cooperative Institute)
 8. Massachusetts Institute of Technology (Lincoln Lab)
 9. Hampton University
 10. Penn State University
 11. University of Maryland, Baltimore County
 12. Utah State University (Space Dynamic Laboratory)

13. Oregon State University (NOAA Cooperative Institute)
14. Texas A&M (Austin)
15. University of Hawaii
16. Boston University
17. University of Massachusetts
18. University of Miami
19. University of Southern Mississippi
20. University of Southern California

★ **Satellite Climate Studies Branch (SCSB) and the Cooperative Institute for Climate and Satellites (CICS)**
University of Maryland, College Park, MD and North Carolina State University, Asheville, NC

★ **Cooperative Remote Sensing Science and Technology Center (CREST)**
City University of New York (CUNY), New York, NY with University Partners in the Mid-Atlantic States and Puerto Rico



Conclusion



- Current suite of instruments proven on Suomi NPP will be flown on JPSS-1 and JPSS-2
- Significant progress in 2014
- The JPSS mission is critical to provide the U.S. and international community with operational continuity of key weather and environmental observations at increased performance.
- **JPSS is on track** (within budget and schedule commitments) for upcoming JPSS-1 satellite mission in early 2017.

<http://www.jpss.noaa.gov/>



QUESTIONS?

