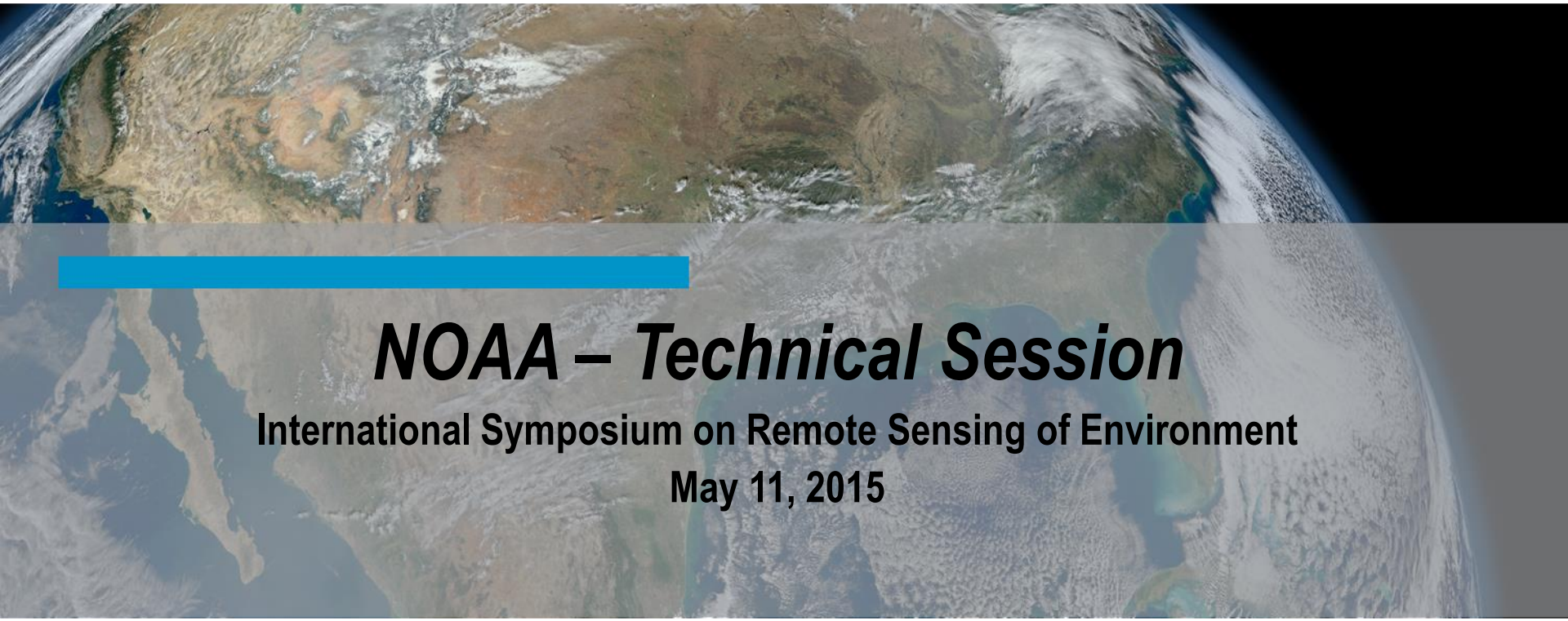


NOAA – Technical Session

International Symposium on Remote Sensing of Environment

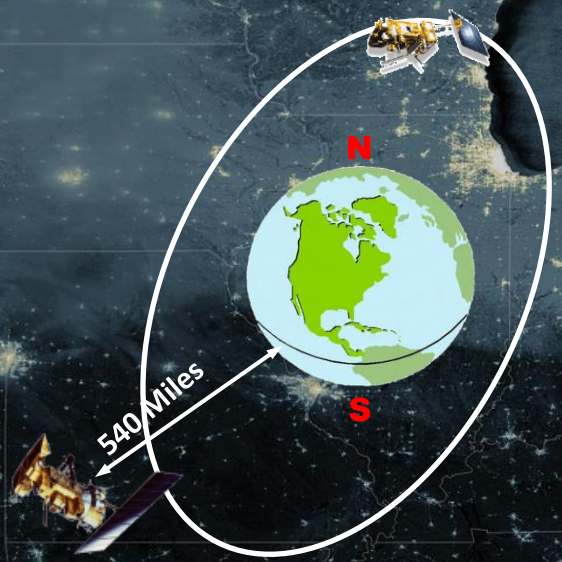
May 11, 2015

NOAA Satellite and Information Service

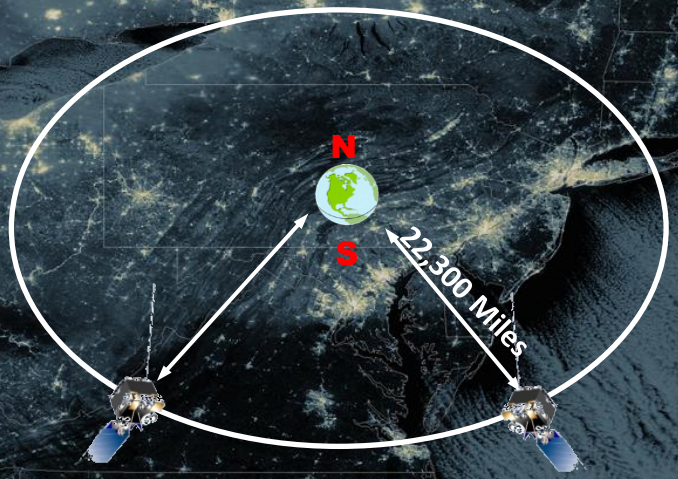
Dr. Stephen Volz, Assistant Administrator

NOAA's Observational Paradigm Has Been: Two Orbits, One Mission

Polar-orbiting Operational Environmental Satellites (POES) Followed by S-NPP and JPSS-1 thru -4



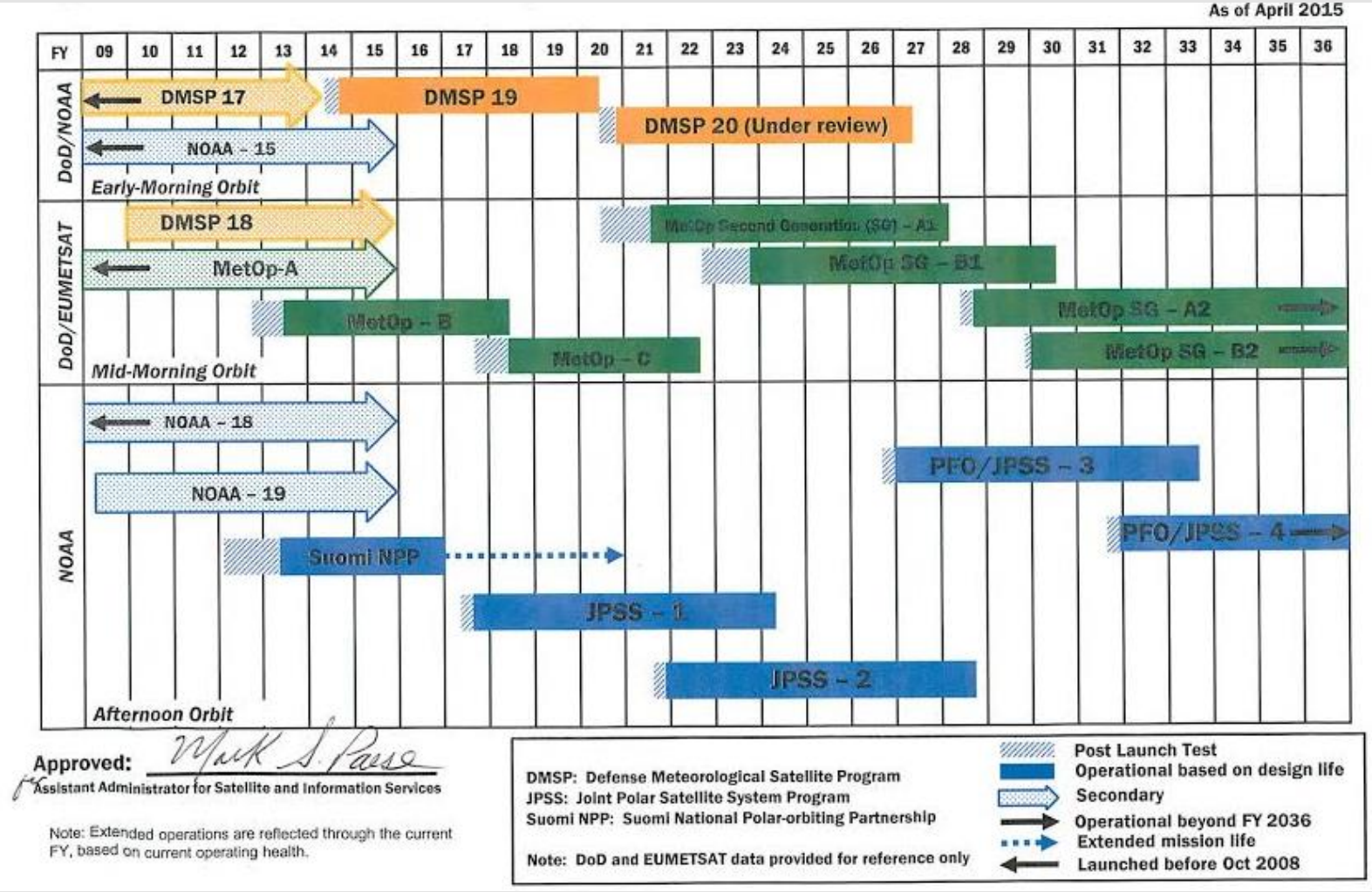
Geostationary Operational Environmental Satellites (GOES), Followed by GOES-R thru -U



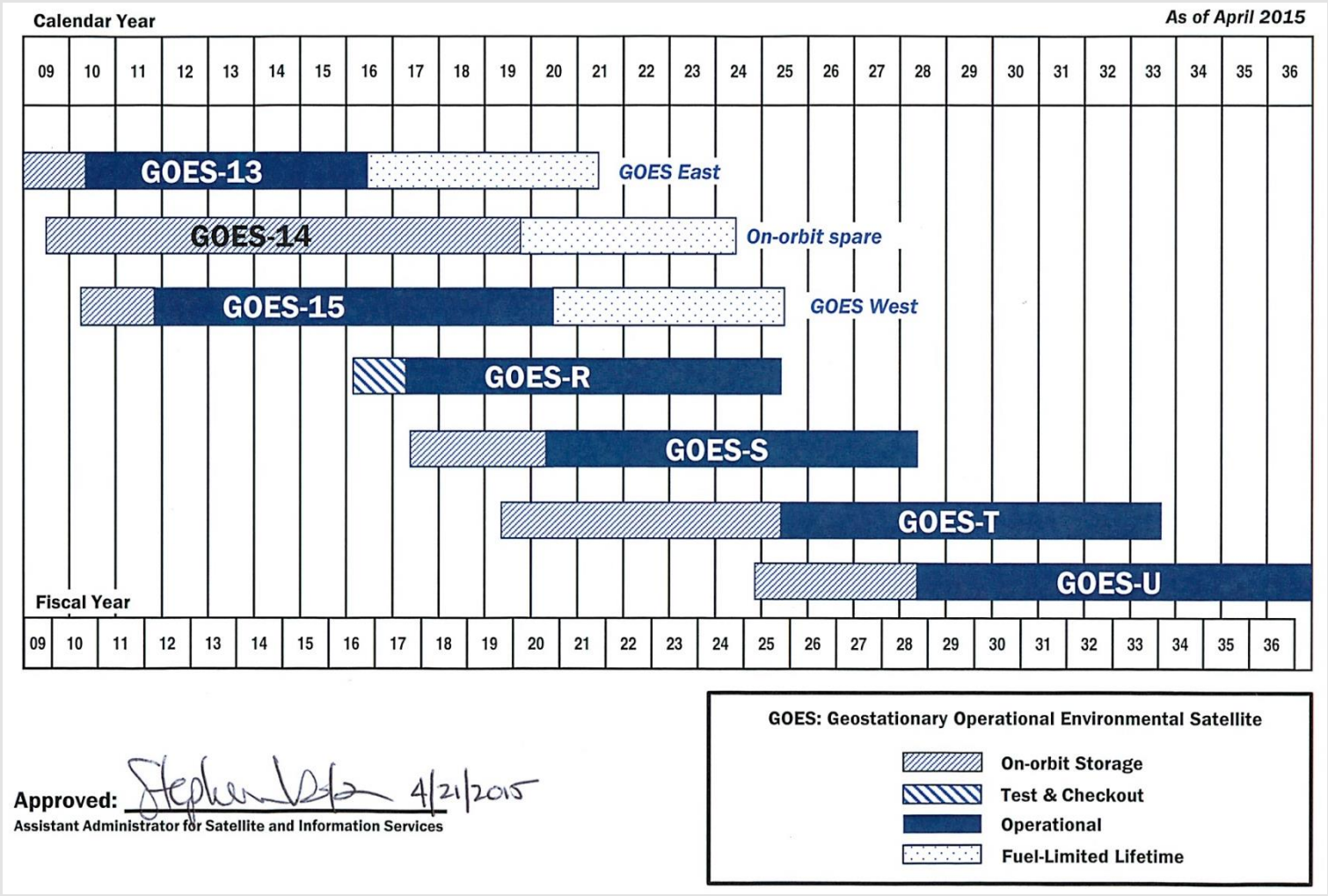
NOAA/NASA

S-NPP image of North America

Polar Flyout Chart



GOES Flyout Chart



NOAA's Established LEO and GEO Platforms

- From Low Earth Orbit
  - The five (5) satellite combination of JPSS + Polar Follow-On (PFO) will establish NOAA's LEO coverage in the afternoon orbit well into the 2030s
  - Cooperative agreements with EUMETSAT and DMSP (near term) establishes the global polar constellation
- From Geostationary Orbit
  - The four (4) satellite combination of GOES-R through –U, continues the GOES-N/O/P series and provides the US continental coverage well into the 2030s
  - Cooperative agreements with EUMETSAT and JMA establishes the global geostationary constellation
- Together, these platforms have and will form the backbone of our observing network for the coming decades
  - To which we will add measurements from other sources to improve our NWP performance

Next-Generation JPSS and GOES-R

JPSS

- **CrIS:** significantly improved temperature and water vapor information than POES HIRS
- **ATMS:** improved global coverage and spatial resolution than AMSU
- **VIIRS:** superior imagery and more spectral bands than AVHRR
- **OMPS:** improved spatial resolution, coverage and vertical profiling than SBUV
- **CERES* and TSIS**:** for fundamental energy budget climate measurements

GOES-R

- **ABI:** superior imagery and more spectral bands than the GOES imager
  - Improved temporal sampling, CONUS every 5 minutes, full disk every 15 minutes and selected 1000 x 1000 km area at 30 seconds
- **GLM:** first ever geostationary lightning mapper
- **SEISS/SUVI/EXIS:** significantly improved space weather coverage
  - Monitors solar radiation, locates solar flares and coronal mass ejections, detects solar irradiance

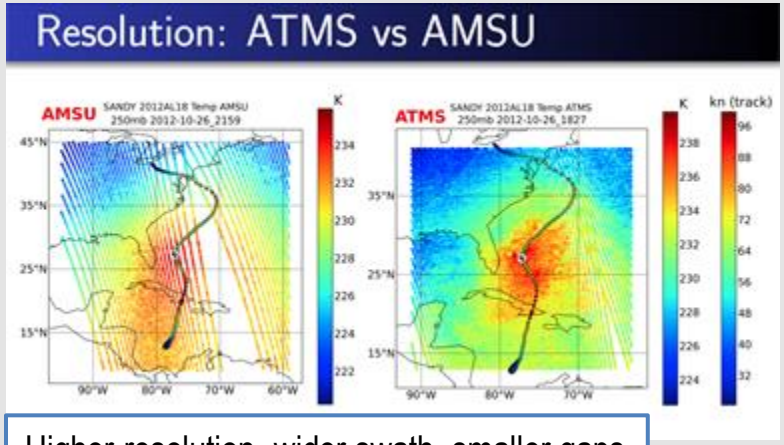
*Contributed by NASA and hosted on JPSS by NOAA

**Contributed by NOAA (for TSIS-1) and flown and operated by NASA

JPSS Next Generation Instruments

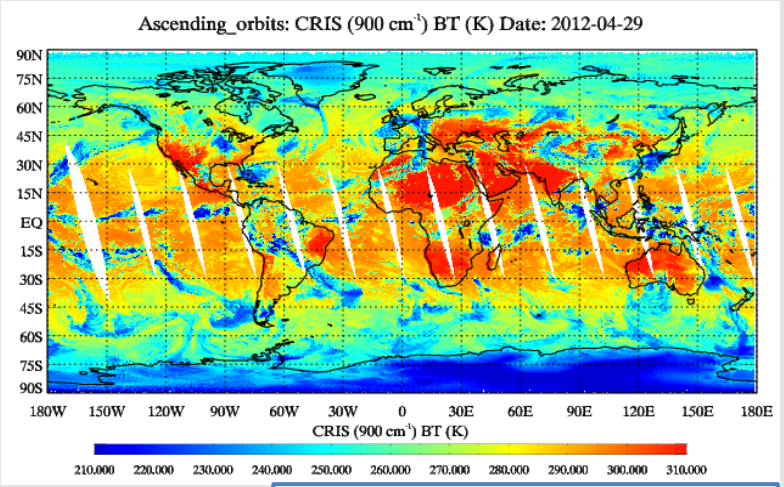
(all measurements are being conducted now on Suomi-NPP)

Advanced Technology Microwave Sounder



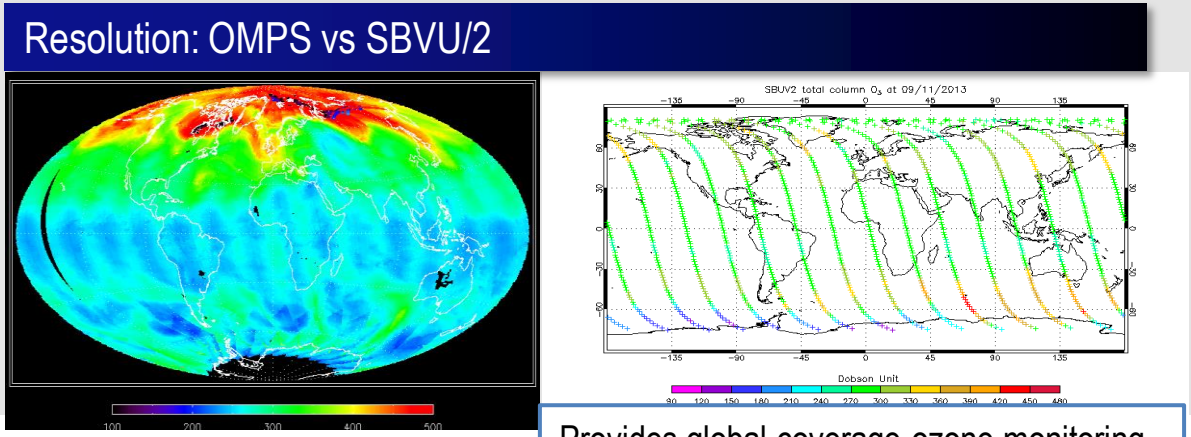
Higher resolution, wider swath, smaller gaps

Cross-track Infrared Sounder



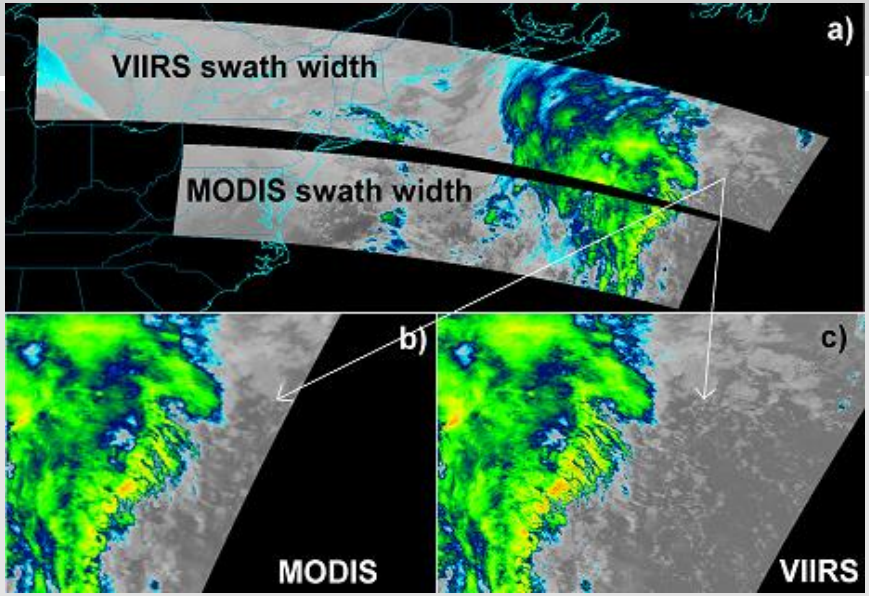
6x more vertical resolving power

Ozone Mapping Profiler Suite

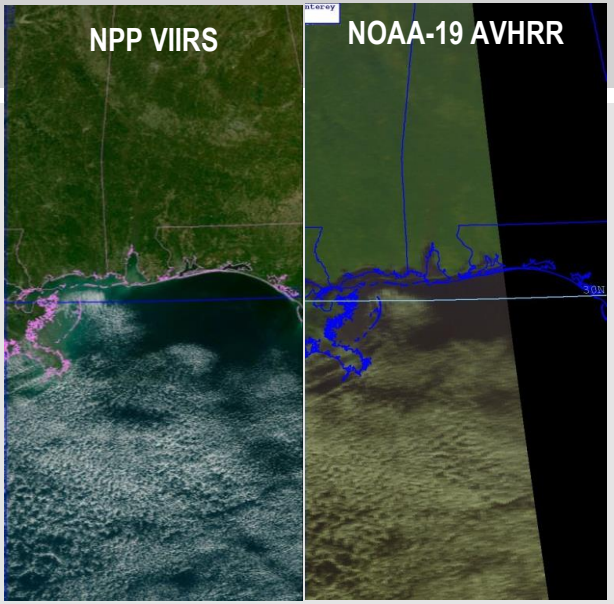


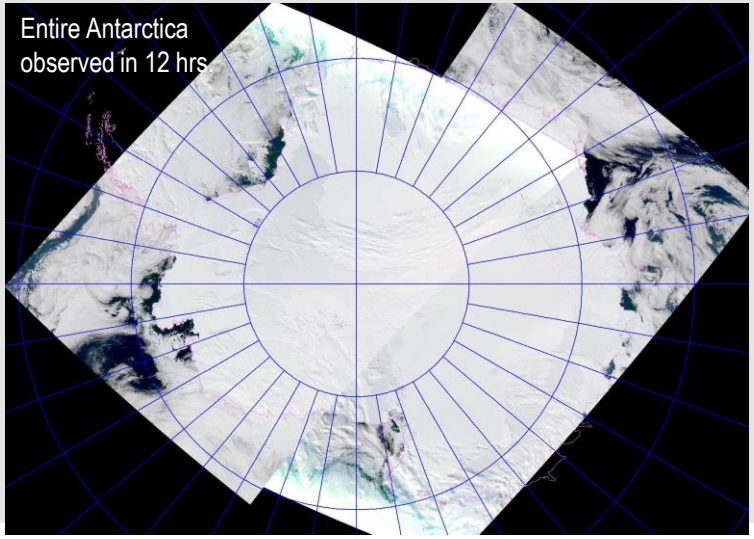
Provides global coverage ozone monitoring

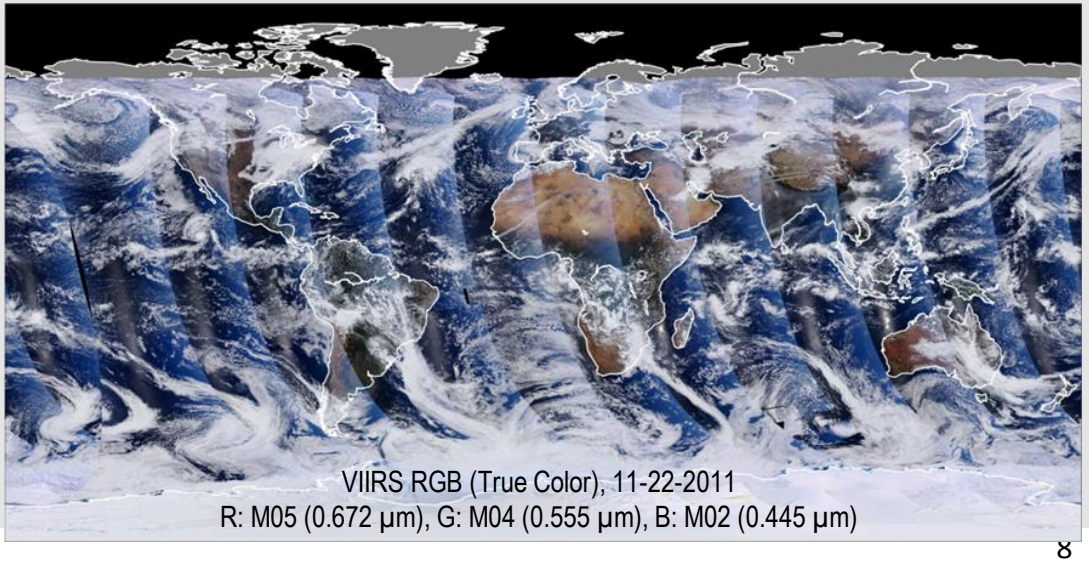
JPSS Next Generation Instruments



The Visible Infrared Imaging Radiometer Suite offers more spectral bands, higher resolution, wider swath and greater accuracy, resulting in a large number of products.



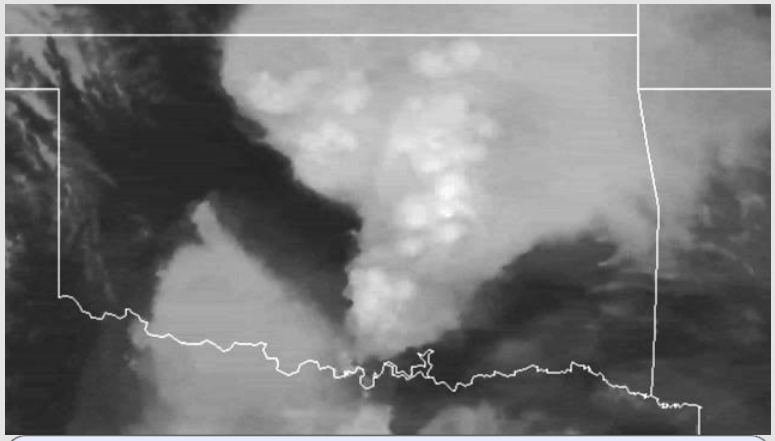




GOES-R Next Generation Instruments

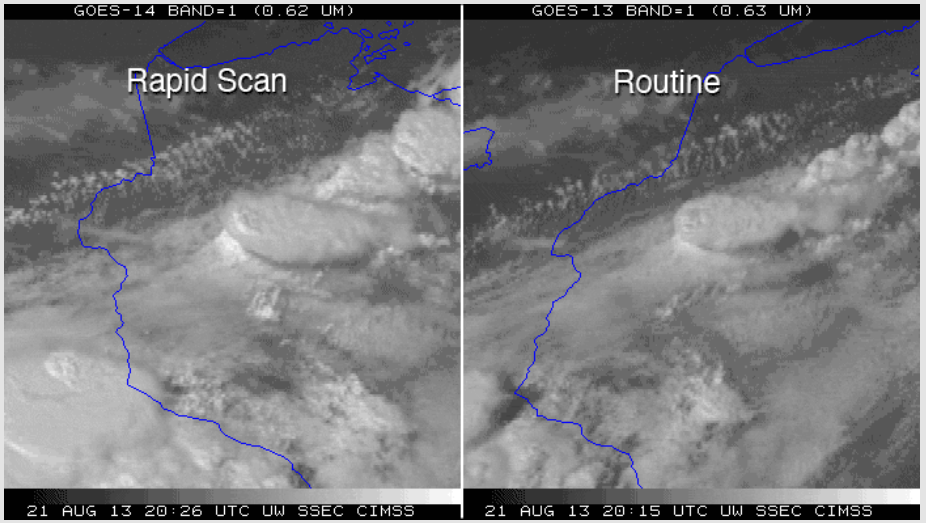
Geostationary Lightning Mapper

- GLM is a near-infrared instrument that maps total lightning
- For the first time, scientists will be able to detect cloud-to-cloud lightning
- Rapid increase in cloud-to-cloud lightning, called a "jump signature," has been shown to precede severe weather on the ground
- Lightning observations will enable meteorologist to better track storm development and intensification



Simulation of GLM lightning detection capabilities during tornado outbreak in Oklahoma

Advanced Baseline Imager

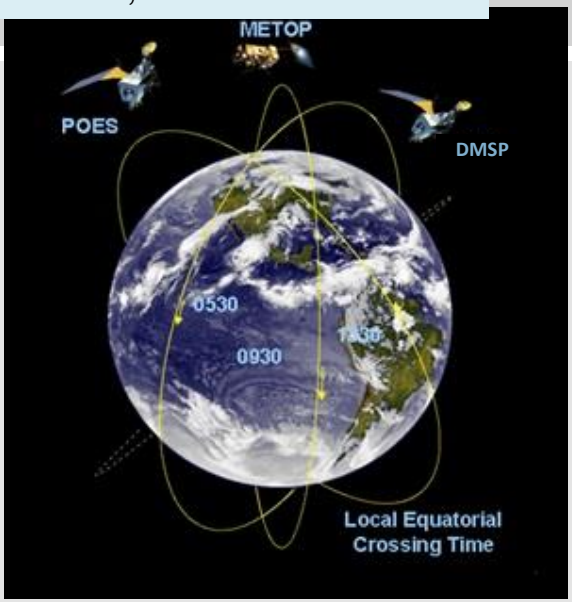


NOAA operated GOES-14 in an experimental rapid scan one-minute mode to simulate ABI capabilities in 2012 and 2013

- Primary instrument on GOES-R
- Five times faster imaging
- Four times the spatial resolution
- More accurate calibration
- New products for severe weather forecasting, volcanic ash advisories and fire and smoke monitoring

Other NOAA/Partner Satellite Missions

w/USAF, EUMETSAT & JAXA



JPSS and Metop: Complementary Orbits

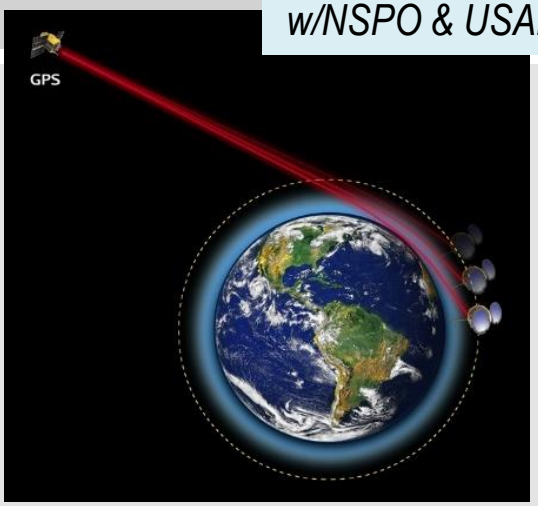
JPSS program implements U.S. civil commitment, interagency and international agreements to afford 3-orbit global coverage.

Following COSMIC, the GNSS-RO mission will provide global radio-occultation measurements of ionosphere, temperature and water vapor information for weather and climate applications.

JASON-3 will continue the legacy of altimetry measurements of sea-level, along with supporting ocean circulation modeling and hurricane intensity predictions.

DSCOVR will provide space weather observations from L1 orbit for up to 60 minute lead time and maintain the nation's solar wind observations.

w/NSPO & USAF

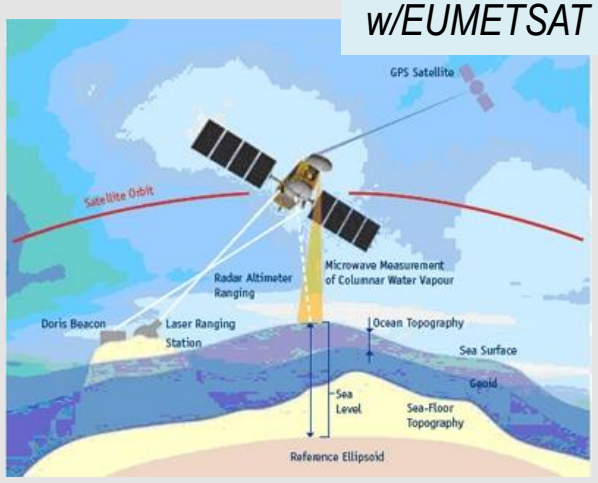


GNSS-RO Launch: 2016

w/NASA

DSCOVR Launched: 11 Feb 2015

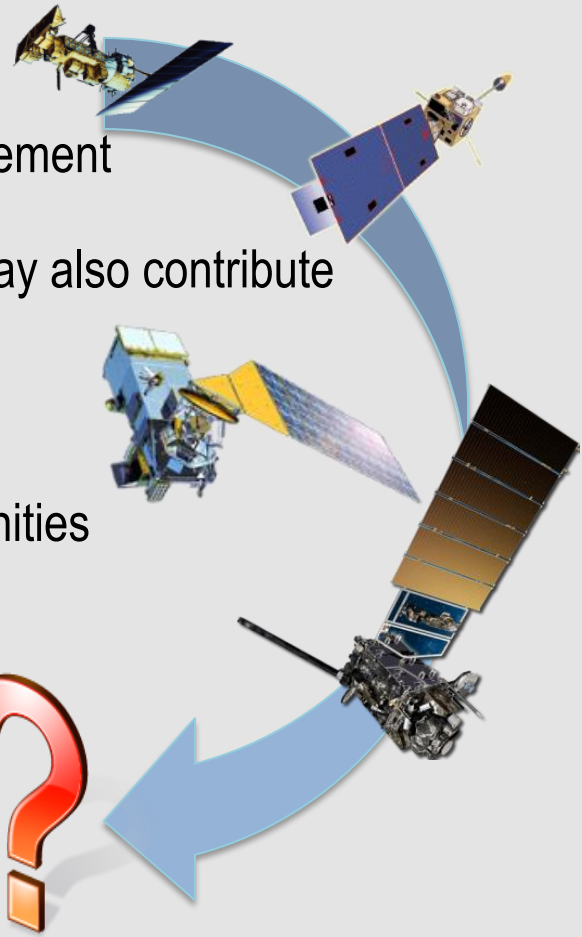
w/EUMETSAT



Jason-3 Launch: July 2015

What's Next?: Moving Beyond "Two Orbits"

- We are broadening our "polar satellite" LEO perspective
  - Core POES/JPSS satellites through ~2038 augmented with:
    - Cosmic-2 RO mission, Earth Observing Nanosatellite-MW
    - Additional complementary evolving and emerging measurement capabilities
    - Smallsats or hosted payloads, alone or in constellation, may also contribute
- We will also broaden our GEO perspective
  - GOES-R series through ~2036, may augment with others:
    - Alterative architectures, including hosted payload opportunities
    - Possibly to include alternative orbits
- Increasingly, the services we provide will be driving towards more integrated data products, merging:
  - Across platforms, both LEO and GEO
  - Across Agencies, using observations from multiple sources
  - Across public-private domain



2016 Initiatives for NOAA/NESDIS

- Funds the Polar Follow On (PFO), to build and deploy the PFO/JPSS-3 and PFO/JPSS-4 and complete the polar satellite time series through late 2030s
- Starts studies of the next Operational Space Weather monitoring mission, to follow DSCOVR, and funds the 2nd set of COSMIC-2 sensors
- Enables continued development of systems engineering and enterprise ground capabilities to integrate the GOES-R and JPSS operations into the other NOAA satellite operations
- Lays the groundwork for the next generation architecture development for LEO, GEO, and Space Weather constellations

Questions?