NPOESS Operations Concept for Providing High Quality Data to the Science Community

Casey Hoercher, Ben James, Karl Salinas, Darren DiBene, Anna Webber, and Mike Simpson

NPOESS Satellite Payloads

1330
Manifested Payloads:
1. VIIRS
2. CrIS
3. ATMS
4. OMPS-Nadir
5. CERES/ERBS
6. SARR
7. SARP
8. A-DCS
9. SEM

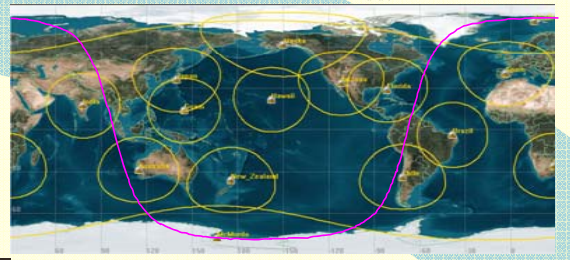
1730
Manifested Payloads:
1. VIIRS
2. MIS
3. SARR
4. SARP
5. A-DCS

NPOESS Locations Around the World

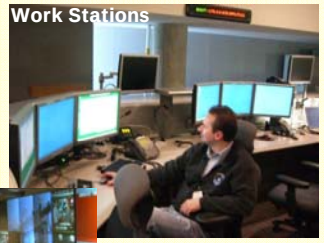
NPOESS Command & Control Station
Svalbard, Norway

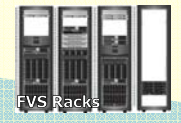
NPP/NPOESS C&C
- C3S Racks/Equipment
- On-Site Support staff

NPOESS SafetyNet™ Receive Nodes

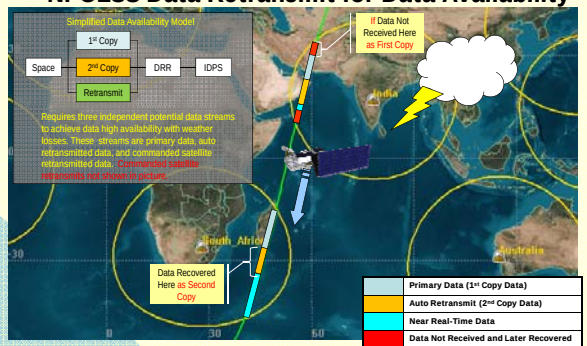


NPOESS Stored Mission Data (SMD)
- C3S Receptors (15 Sites)
- Unmanned autonomous sites
- Ka Band





NPOESS Data Retransmit for Data Availability



- Three download opportunities maximize data capture
- First and second copy data transmission are always commanded
- Satellite has retransmit capability to capture dropped data
- Data not received during First Copy Playback will be recovered during Second Copy Playback (Auto Retransmit) at the next Ground Station

NPOESS Locations in the US

AFWA
(Air Force Weather Agency)
Offutt AFB, NE

NPOESS Mission Management Center (MMC)
NSOF Suitland, MD

FNMOC
(Fleet Numerical Meteorology & Oceanography Center)
Monterey, CA

O&S Team (30 + staff)
- Principle operations center
- Operations Director
- Satellite Controllers
- Satellite Analysts
- Mission Planner

NPOESS Ground Elements
- C3S Command and Control Segment
- Flight Vehicle Simulator

NPOESS Space ISF, Ground ISF and ILS facilities

Support Facilities
- Ground ISF –Aurora CO
- Space ISF – Redondo Beach CA
- ILS Facility – Indianapolis IN

NPOESS Backup Relay C&C Equipment
White Sands, NM

NPP/NPOESS C&C Backup Relay
- C3S Racks/Equipment

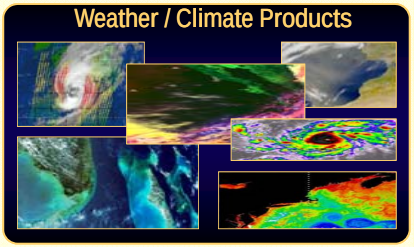
NAVOCEANO
(Naval Oceanographic Office)
Stennis, MS

NESDIS
NSOF, Suitland, MD

NPOESS Alternate Mission Management Center (AMMC)

NPOESS Ground Elements
- C3S Command & Control Segment Backup equipment

Climate Products Ready for End Users



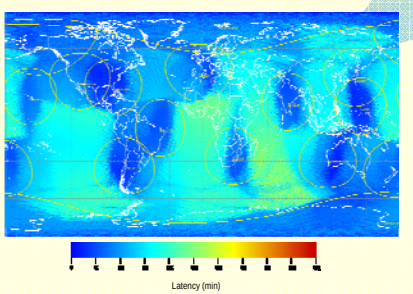
Operations and Support is at the Center of Everything

- Manage all worldwide operations activities for NPOESS
- Conduct round-the-clock operations to ensure quality Earth and space environmental data is delivered promptly to our diverse customers and maximize systems & data availabilities and minimize system latency
- Participate in NPOESS designs to ensure users' operations and science needs are supported, providing ease of operations, efficient & effective maintenance and support processes, and optimized life-cycle costs
- Direct the NPOESS operations support functions
- Provide long term system maintenance including data quality management and ground system technical refreshes

NPOESS Field Terminals

The FT Segment
- Ingest of High Rate and Low Rate Data (HRD/LRD) streams from NPOESS satellites
- Ingest of Mission Support Data from NPOESS satellites
- Production of RDRs, SDRs, TDRs, EDRs from HRD/LRD
- Design builds directly upon the IDPS design, utilizing all State 1 reuse/ heritage

Latency from Sensor to User



-16 SafetyNet™ Stations at 15 different sites allows for lower latency times
- 77% of the data is processed and delivered within 15 minutes of observation
- 95% of the data is processed and delivered within 28 minutes of observation

Interface Data Processing (IDP) Segment

System Level Data Quality Monitoring (DQM) – NSOF only
- Responds to PRO Data Quality Notifications (DQN)
- Performs Data Product Metadata and Parameter Trending
- Calculates metrics (mean, max, min, STD, Kurtosis, Skew)
- Provides visualization, graphing, analysis, and reporting procedures and tools

Granule processing
- Granules are configurable temporal blocks of observed data (scans/swaths)
- Granules are processed in parallel within and across sensors
- Cross-granule and cross-sensor data sharing is built in
- Granules are delivered separately or aggregated together

Data Delivery Subsystem (DDS)
- The single provider of NPP Data Products to Central Users, NASA SDS, CLASS (ADS), and NSIPS
- Converts requested products from a binary, internal format into Hierarchical Data Format v5 (HDF5)
- Capabilities include packaging of geo-related products, aggregation, and geospatial and temporal subsetting

Latency
- Number of granules processed in parallel is configurable and expandable
- Granule size/duration and extended content is configurable by IDPS for data latency purposes only
- Priority of granule processing is configurable
- Granule processing is configurable to optimize hardware utilization