



NOAA's NPOESS Data Exploitation (NDE) Products

Transitioning from Research to Operations



Tom Schott¹, Jim Yoe¹, Stacy Bunin²

¹ NOAA/NESDIS Office of Systems Development, Suitland, MD

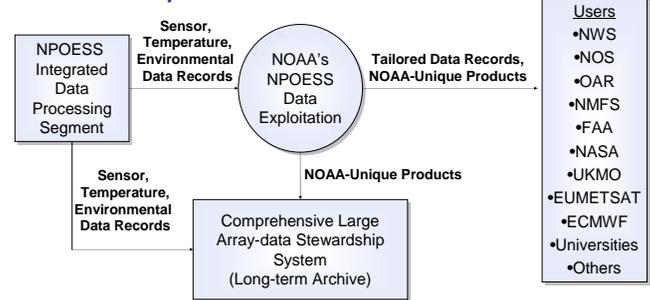
² Noblis, Falls Church, VA

Abstract

NOAA's National Polar-orbiting Operational Environmental Satellite System (NPOESS) Data Exploitation (NDE) project will provide civilian users of environmental satellite information with NPOESS data. Through NDE, heritage users will continue to receive critical polar-orbiting satellite data to maintain their current mission support, and new users will take advantage of the improved and expanded suite of products that the NPOESS-era sensors will provide. To satisfy end-user requirements NDE will make two different categories of products available: tailored versions of the NPOESS data records delivered by NPOESS contractors and NOAA-unique products developed by NOAA researchers and contractors. Environmental, sensor, and temperature data records will be repackaged and tailored to meet specific product attributes such as format, coverage, frequency, and projection depending on user needs. NOAA-unique products are those in which additional science processing of data records will be performed to satisfy NOAA-unique mission requirements. The initial focus of NOAA-unique products will be hyper-spectral soundings, atmospheric carbon products, microwave surface and precipitation products, and sea surface temperature products. This poster describes the NOAA's NPOESS products and the process NOAA is using to transition products from research into operations.

NDE MISSION:

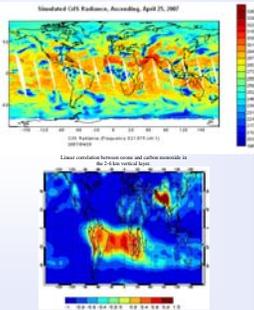
Assist NOAA and other civilian customers to realize the potential of NPOESS observations



Initial NOAA Unique Product Development from NPP data

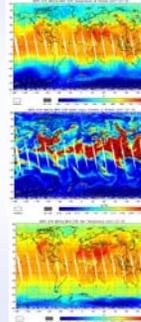
Hyperspectral Soundings and Carbon Products

- Hyperspectral products will be generated from CrIS data and collocated with ATMS field of regard
- Products include spectrally and spatially thinned radiances; cloud cleared radiances; atmospheric concentrations of carbon dioxide, methane, and carbon monoxide; temperature, moisture, and ozone retrievals
- Benefit of data: Hyperspectral measurements are used to improve knowledge of temperature, moisture, and ozone, for both weather and climate applications
- Continuity from Aqua AIRS/AMSU-A and MetOp IASI/AMSU-A data



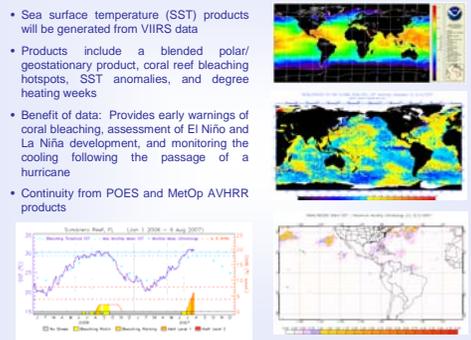
Microwave Soundings, Surface, and Precipitation Products

- The Microwave Integrated Retrieval System (MIRS) will provide retrievals from ATMS in all weather and all surface conditions
- Products include cloud liquid water, precipitation rate, snow cover, snow water equivalent, sea ice concentration, skin temperature, temperature profiles, total precipitable water, water vapor profiles, and hydrometeor profiles
- Benefit of data: Used to improve numerical weather prediction models, estimations of rainfall, and continuity of climate monitoring for El Niño, water cycle changes, and long-term climate change
- Continuity from POES and MetOp AMSU-A and MHS products



Sea Surface Temperature Products

- Sea surface temperature (SST) products will be generated from VIIRS data
- Products include a blended polar/geostationary product, coral reef bleaching hotspots, SST anomalies, and degree heating weeks
- Benefit of data: Provides early warnings of coral bleaching, assessment of El Niño and La Niña development, and monitoring the cooling following the passage of a hurricane
- Continuity from POES and MetOp AVHRR products



Transition to Operations

NDE products will be developed and transition from research to operations using the Satellite Products and Services Review Board (SPSRB) process.

Government users can identify the need for a new or significantly improved NDE product with a user request (<http://projects.osd.noaa.gov/spsrb/>). For validated requests, an Integrated Product Team (IPT) will be formed consisting of research scientists, product area leads, data center representatives, and end users. The team will document development options and recommend a solution to the SPSRB. Once the proposal is approved and funded, product development will proceed through three phases: development, pre-operational, and operational.

Scientists from the Center for Satellite Applications and Research (STAR) will normally lead the development phase, including algorithm development. Product area leads from the Office of Satellite Data Processing and Distribution (OSDPD) will lead the operational phase. Both NESDIS offices will work together during the pre-operational phase to ensure a smooth and timely transition of the NDE product from research to operations. As members of the IPT, end users will be involved with the development process and kept updated on the development progress. When all of the product development steps are completed and validated, the SPSRB and the user will meet to approve the product and a decision will be made to move the product into operations.

A major focus of NDE's efforts will be to ensure mission continuity from current satellite systems is uninterrupted.

Mission continuity replacement products projected to be delivered to users within 21 months after launch

CrIS Thinned Radiances	Blended SST	Nadir Ozone Profile
CrIS Cloud Cleared Radiances	SST Anomalies	Ozone Total Column
Total Precipitable Water (ATMS)	Coral Reef Degree Heating	Snow Cover and Depth
Snow Cover (ATMS)	Coral Reef Bleaching	Imagery
Precipitation Type/Rate (ATMS)	Total Ozone (CrIS)	Ocean Color/Chlorophyll
Surface Emissivity (ATMS)	Carbon products	Vegetation Index
Cloud Liquid Water (ATMS)	SST (AVHRR-like)	Active Fires
Sea Ice Cover/Concentration (ATMS)	Aerosol (AVHRR-like)	Atmospheric Temperature Profile
Snow Water Equivalent (ATMS)	ATMS Radiances	Atmospheric Moisture Profile
Ice Water Path (ATMS)	CrIS Radiances	Aerosol Optical Thickness
Land Surface Temperature (ATMS)	VIIRS Radiances	Land Surface Type
Temperature Profiles (ATMS)	OMPS Radiances	Surface Albedo
Moisture Profiles (ATMS)	Cloud Mask	Cloud Cover/Layers
Rain Water Path/Profile (ATMS)	Sea Surface Temperature (SST)	

NOAA Unique Products required for mission continuity are augmented environmental products generated from NPOESS data.

Sensor, Temperature, and Environmental Data Records from the NPOESS Ground System required for mission continuity. These will be tailored to meet specific user requirements for formats, coverage, projection, frequency, etc.

Enhanced products projected to be delivered to users following the completion of the mission continuity products.

Polar Winds (VIIRS)	Aerosol Particle Size
Clear Sky Radiances (VIIRS)	Cloud Top Temperature
Vegetation Health	Cloud Top Pressure
Vegetation Moisture	Land Surface Temperature (VIIRS)
Drought Indices	Cloud Base Height
Vegetation Thermal Conditions	Cloud Effective Particle Size
Leaf Area Index	Cloud Optical Thickness
Fire Potential	Cloud Top Height (VIIRS)
Near Coast Ocean Color	Ice Surface Temperature
Integrated xDRs at CrIS Resolution	Net Heat Flux
Cloud Liquid Water Path (VIIRS)	Sea Ice Characterization (VIIRS)
Cloud Ice Water Path (VIIRS)	Suspended Matter
Cloud Top Temperature (VIIRS)	Atmospheric Pressure Profile
	Quarterly Surface Type Gridded
	Soil Moisture

NOAA Unique Products that are new or currently under development are augmented environmental products generated from NPOESS data.

Environmental Data Records from the NPOESS Ground System that are not mission continuity. These will be tailored to meet specific user requirements for formats, coverage, projection, frequency, etc.