NOAA’s Transition to Operations of NDE SNPP Products

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Discussion Outline

• NDE Mission and System Overview
• NOAA’s Product Priorities
• Transition to Operations of SNPP Products
  – Atmospheric Radiances and Soundings
  – Imagery
  – Microwave Sounding and Imagery
  – Ozone
  – Sea Surface Temperature
  – Polar Winds
  – Tropical Cyclone
  – Others
The NDE Project’s primary mission is to provide near real time products derived from SNPP observations to NOAA’s operational and climate communities and other civilian and U.S. Government users.

Product access capabilities include SNPP SDRs, EDRs, and NDE Unique Products (NUPs) with tailoring options.

- Highest priority products are continuation of capabilities provided by existing POES, DMSP, and EOS satellite missions.
- Exploitation of new SNPP capabilities to satisfy user requests.
NDE System Overview

NDE

Ingest
Product Generation
Product Distribution
System Monitoring
User Services

JPSS/SNPP
Ground System

Data Records

NOAA Satellite
Operations Facility (NSOF)

NDE Unique
Products (NUP)

Tailored Products

Data Records

External/Internal Operational Users
Archive – CLASS (NUPs only)

SNPP

Svalbard

NASA VIIRS Image
### NOAA Near-Real Time Priorities

#### Critical

- **RDR, TDR and SDR data required of JPSS:**
  - CrIS
  - ATMS
  - AMSR-2/3
  - VIIRS

- **VIIRS**
  - Imagery EDR
  - Sea Surface Temperature
  - Ocean Color/Chlorophyll
  - Green Vegetation Fraction
  - Polar Winds

- **AMSR-2**
  - Sea Surface Temperature

#### Supplemental High

- **RDR and SDR data considered SH for JPSS:**
  - OMPS-L
  - OMPS-NP
  - CERES

- **EDRs considered SH for JPSS:**
  - CrIS/ATMS
  - Atmospheric Temperature Profile
  - Atmospheric Moisture Profile

- **ATMS**
  - Cloud Liquid Water
  - Rainfall Rate
  - Sea Ice Concentration
  - Snow Cover
  - Snow Water Equivalent
  - Total Precipitable Water

- **OMPS Nadir and Limb**
  - Nadir Ozone Profile
  - Ozone Total Column
  - Ozone Limb Profile

- **CERES**
  - Reflected Solar Radiation

#### Supplemental Low

- **RDR and SDR data considered SL for JPSS:**

- **EDRs considered SL for JPSS:**
  - ATMS
  - Land Surface Temperature
  - Moisture Profile
  - Temperature Profile

- **CrIS**
  - Trace Gases (CO, CO2, CH4)

- **VIIRS**
  - Aerosol Optical Thickness
  - Aerosol Particle Size
  - Vegetation Index
  - Land Surface Type
  - Land Surface Temperature
  - Surface Albedo
  - Cloud Top Temperature
  - Cloud Top Pressure
  - Cloud Base Height
  - Ice Surface Temperature
  - Quarterly Surface Type
  - Vegetation Health Product Suite

- **AMSR-2**
  - Surface Type

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*Key performance parameters are identified in red*

*NESDIS developed algorithms are identified in blue*
Atmospheric Radiances

• Use in numerical weather prediction models has a measurable impact on global weather prediction

• Infrared Radiances
  — Generated from CrIS
  — 399 channel product sent to NWS
  — 1305 channel product sent to EUMETSAT
  — BUFR format

• Microwave Radiances
  — Generated from ATMS
  — Provided to NWS and EUMETSAT
  — BUFR format
Atmospheric Soundings

- Used to improve knowledge of atmospheric temperature and moisture for weather and climate applications

- ATMS and CrIS based products
  - Atmospheric temperature, moisture, and pressure profiles
  - Generated in NetCDF4
  - Available to NWS field offices and NCEP centers on AWIPS-II
Imagery

- Includes high resolution imagery (375m) in the northern latitudes of Alaska that aren’t served by GOES data
- VIIRS visible (I1) and infrared (I4 and I5 bands are sent to the NWS Satellite Broadcast Network, ingested and displayed on NWS AWIPS II workstations for Alaska
- NetCDF4 format
Microwave Integrated Retrieval System (MIRS)

- Microwave sounding and imaging products over all-weather conditions
  - Helps forecasters detect precipitation potentials
  - Enhances NOAA’s weather forecasting and climate monitoring capability
- ATMS based products in NetCDF4
  - Total precipitable water
  - Precipitation rate
  - Cloud liquid water
  - Snow water equivalent
  - Snow cover
  - Sea ice concentration
  - Land surface temperature
  - Land surface emissivity
  - Temperature and moisture profiles
Ozone

- Used in ozone hole monitoring and assessment
- Used to determine ozone layer recovery and impacts due to climate change
- OMPS ozone products
  - Total column
  - Nadir profile
  - Blended total ozone analysis using infrared ozone measurements and ultraviolet measurements provides a full coverage global map of ozone
  - BUFR format
Sea Surface Temperature

- Assimilated into weather and ocean forecast models; provides critical fisheries and coral reef habitat monitoring
- Blended SST combines higher spatial resolution from polar-orbiters with higher temporal resolutions from geostationary satellites
- VIIRS based products
  - Global and regional SST analyses
  - Blended SST
  - NetCDF4 format
Polar Winds

- Model impact studies showed that forecasts could be extended 2-6 hours with MODIS Polar Winds
- A similar impact expected with the use of VIIRS data
- VIIRS based products
  - Wind speed, direction, and height at high latitudes
  - NetCDF4, BUFR, McIDAS MD, and text formats
  - Coverage: Arctic and Antarctica
Tropical Cyclone

• Provide guidance to forecasters at National Hurricane Center and other tropical cyclone prediction centers

• ATMS-based intensity and structure estimates includes
  ─ Maximum winds
  ─ Minimum sea level pressure
  ─ Radii of 34, 50, and 64-knot winds
Others…

- Green Vegetation Fraction
- Vegetation Health
- Blended Snow
- Ocean Color
- Global Soil Moisture
- Tropical Rainfall Potential (eTRaP)
- Active Fires
- Etc.
Summary

• NESDIS successfully transitioned NDE’s capabilities from development to operations and is developing additional satellite products
• NDE is tailoring SNPP products for NOAA’s near real-time user community
• NDE is developing capabilities to provide users with continuity of data from current POES, DMSP, and EOS missions