



NOAA's Transition to Operations of NDE SNPP Products

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NOAA Satellite and Information Service

National Environmental Satellite, Data, and Information Service (NESDIS)





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





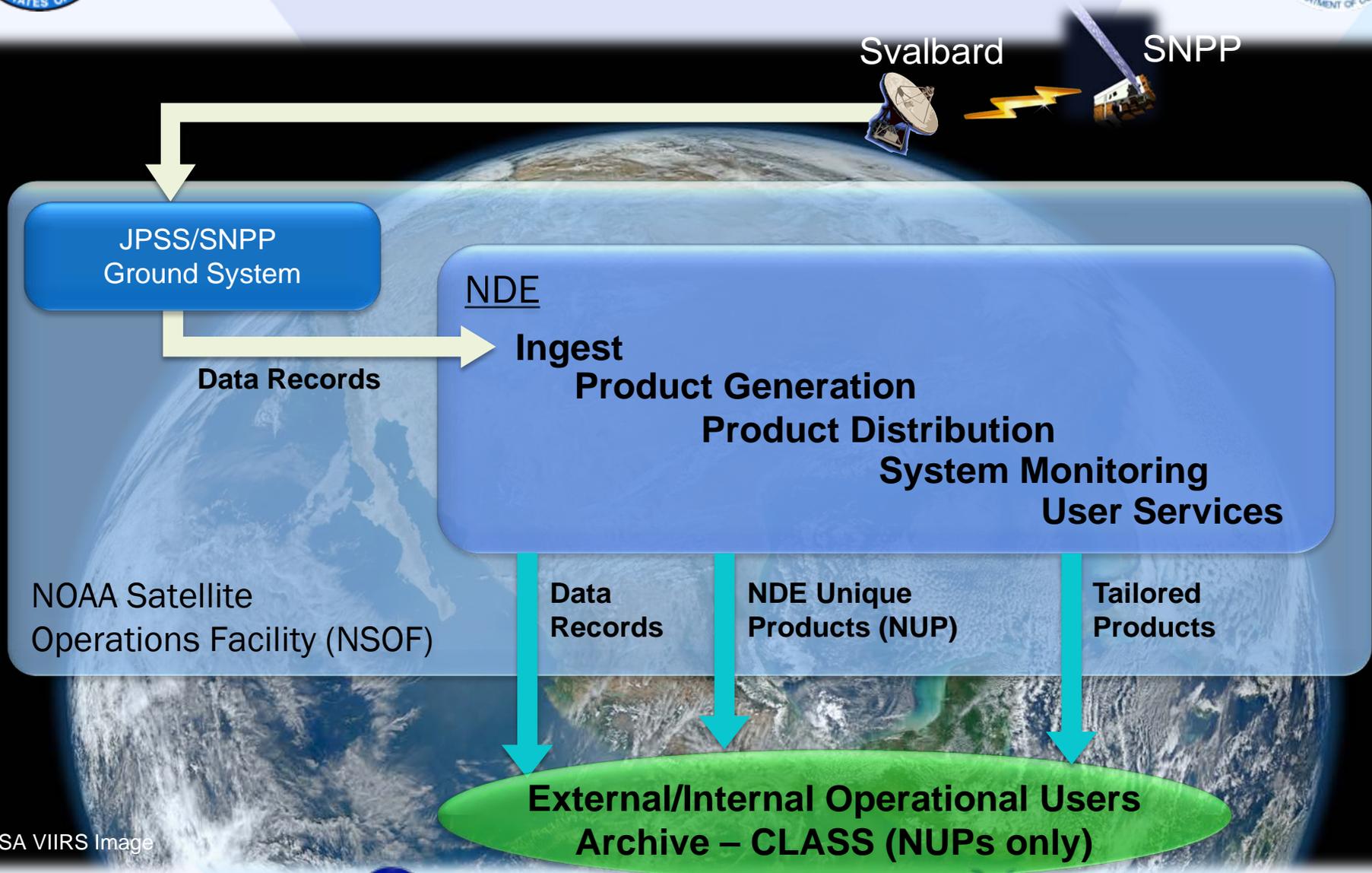
NOAA's NPP Data Exploitation (NDE) Project Overview

- 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



NOAA Satellite Operations Facility (NSOF)

NDE

Ingest

Product Generation

Product Distribution

System Monitoring

User Services

Data Records

NDE Unique Products (NUP)

Tailored Products

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





NOAA Near-Real Time Priorities



Critical

RDR, TDR and SDR data required of JPSS:

CrIS *ATMS* *AMSR-2/3*
VIIRS

EDRs required of JPSS:

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

AMSR-2

Sea Surface Temperature

Additional Capabilities

ADCS Data
SARSAT Data

Supplemental High

RDR and SDR data considered SH for JPSS:

OMPS-L OMPS-NP CERES

EDRs considered SH for JPSS:

CrIS/ATMS VIIRS
Atmospheric Temperature Profile *Sea Ice Characterization*
Atmospheric Moisture Profile *Snow Cover*

ATMS *Active Fires*

Cloud Liquid Water *Suspended Matter*
Rainfall Rate *Cloud Cover/Layers*
Sea Ice Concentration *Cloud Mask*
Snow Cover *Cloud Effective Particle Size*
Snow Water Equivalent *Cloud Optical Thickness*
Total Precipitable Water *Cloud Top Height*

OMPS Nadir and Limb

Nadir Ozone Profile
Ozone Total Column
Ozone Limb Profile

CERES

Reflected Solar Radiation

AMSR-2

Sea Surface Wind Speed
Sea Ice Characterization
Clear Liquid Water
Precipitable Water
Soil Moisture
Precipitation Type/Rate
Snow Cover/Depth
Snow Water Equivalent

CrIS

Infrared Ozone Profile
Outgoing Longwave 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

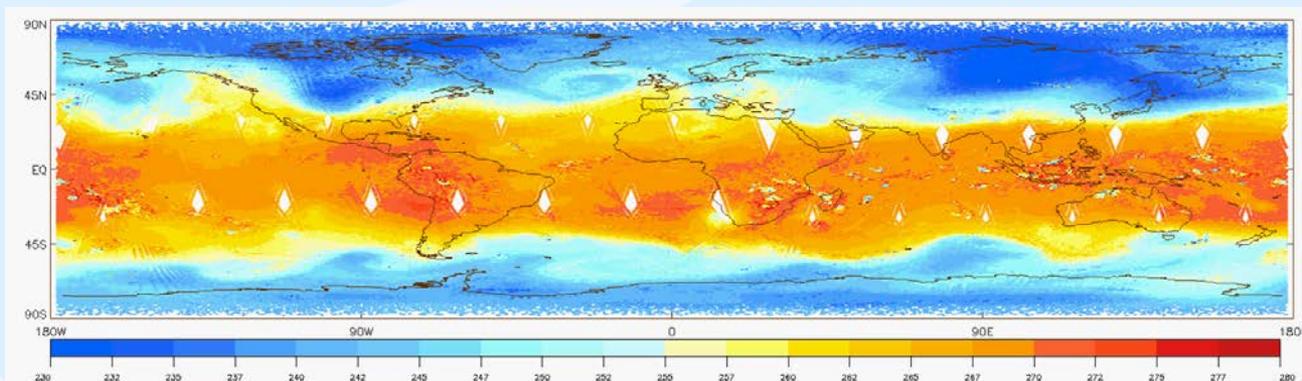
Key performance parameters are identified in red
NESDIS developed algorithms are identified in blue





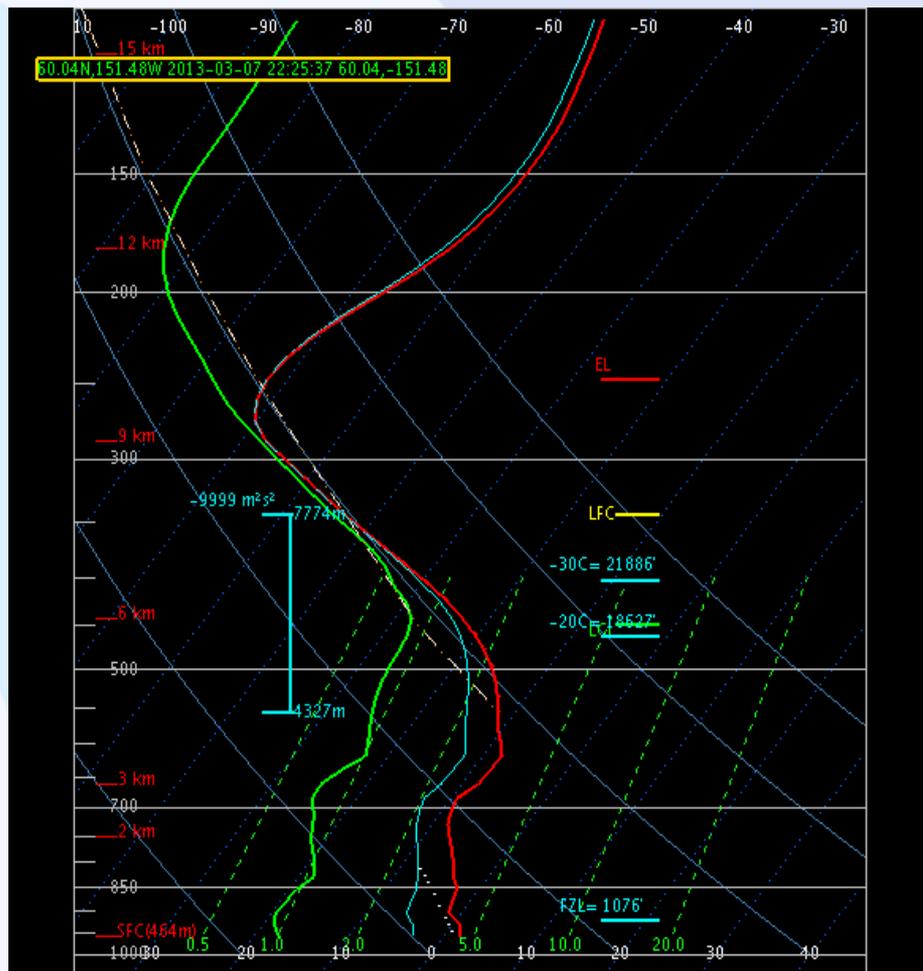
Atmospheric Radiances

- **Use in numerical weather prediction models has a measureable 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



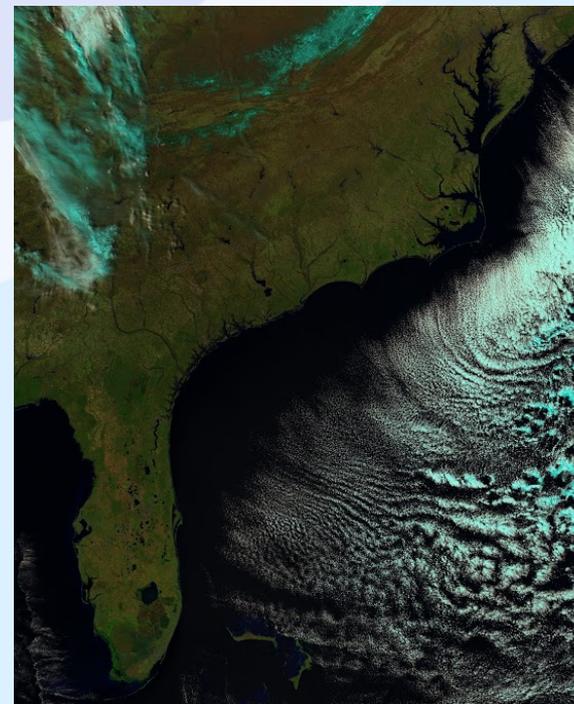
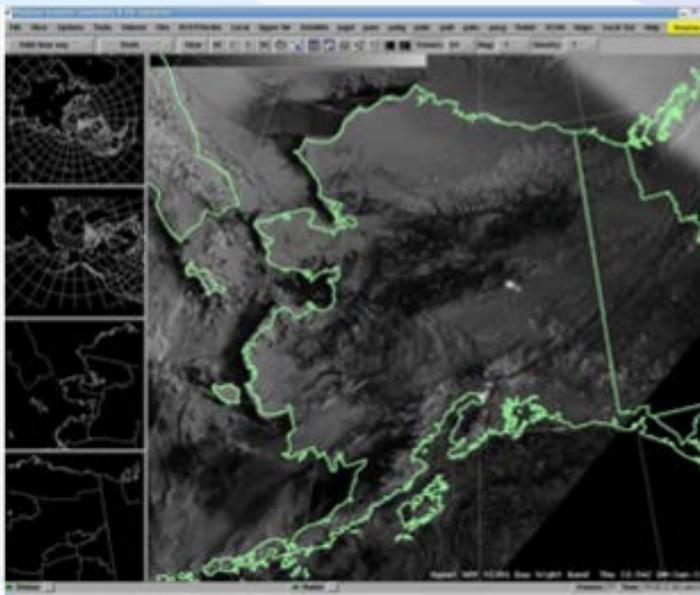
- Used to improve knowledge of atmospheric temperature and moisture for weather and climate applications
- ATMS and CrIS based products
 - Atmospheric temperature, moisture, and pressure profiles
 - Generated in NetCDF4
 - Available to NWS field offices and NCEP centers on AWIPS-II





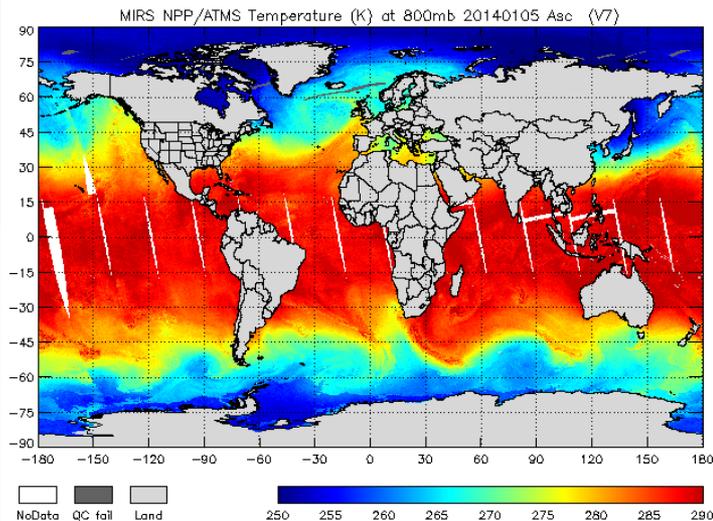
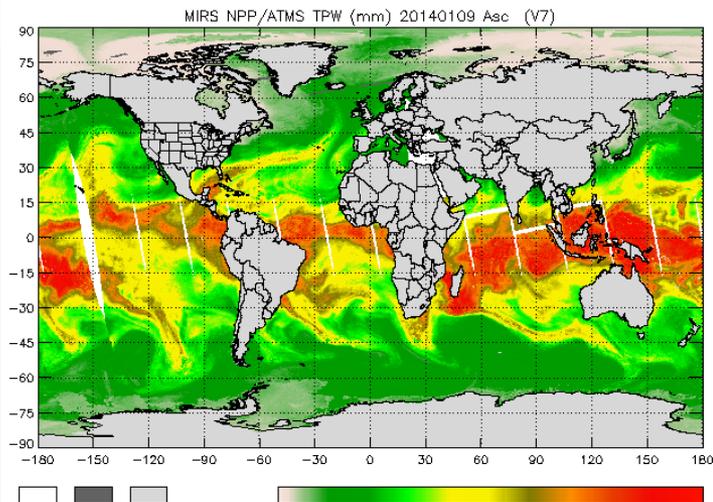
Imagery

- 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

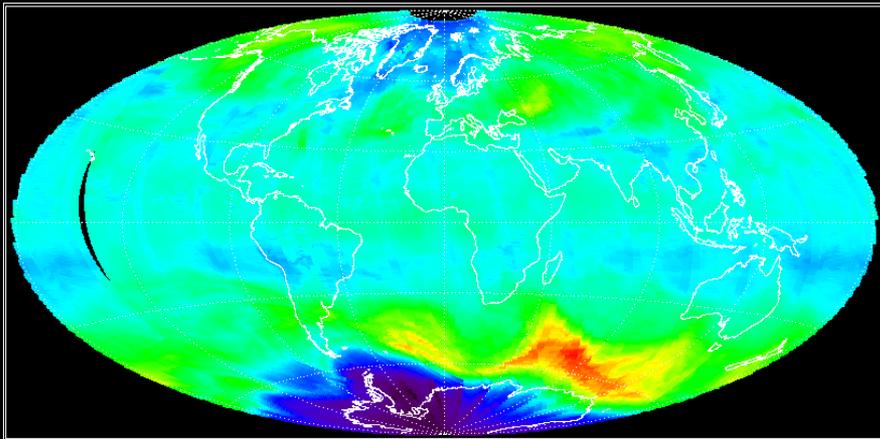




Ozone

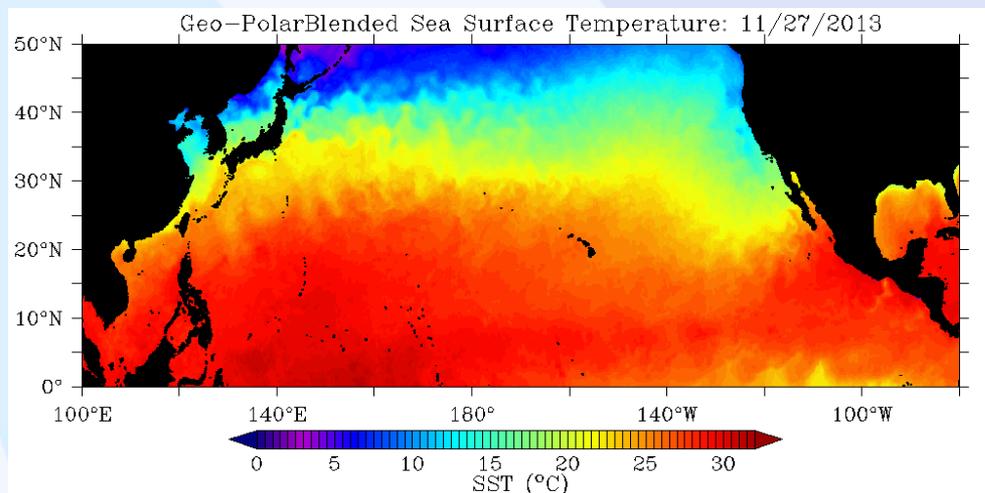
- Used in ozone hole monitoring and assessment
- Used to determine ozone layer recovery and impacts due to climate change
- OMPS ozone products
 - Total column
 - Nadir profile
 - Blended total ozone analysis using infrared ozone measurements and ultraviolet measurements provides a full coverage global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

OMPS 00TCO Total Ozone for 20130930





Sea Surface Temperature



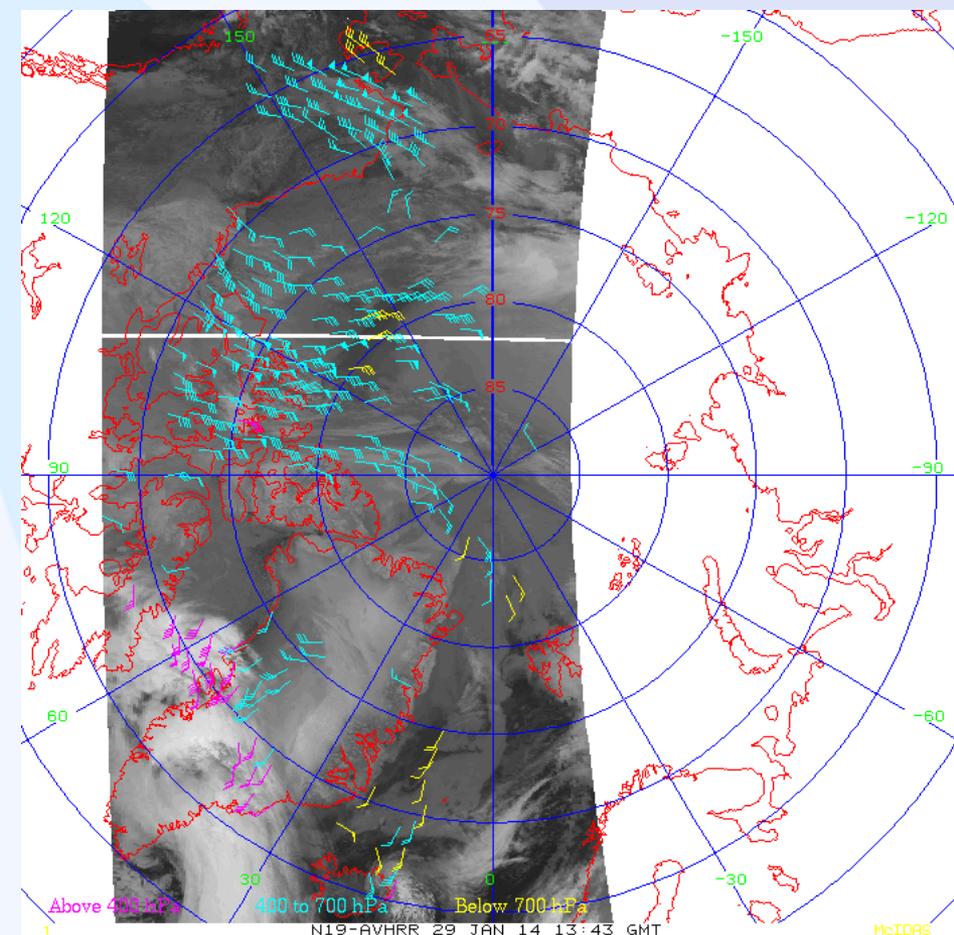
- Assimilated into weather and ocean forecast models; provides critical fisheries and coral reef habitat monitoring
- Blended SST combines higher spatial resolution from polar-orbiters with higher temporal resolutions from geostationary satellites
- VIIRS based products
 - Global and regional SST analyses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





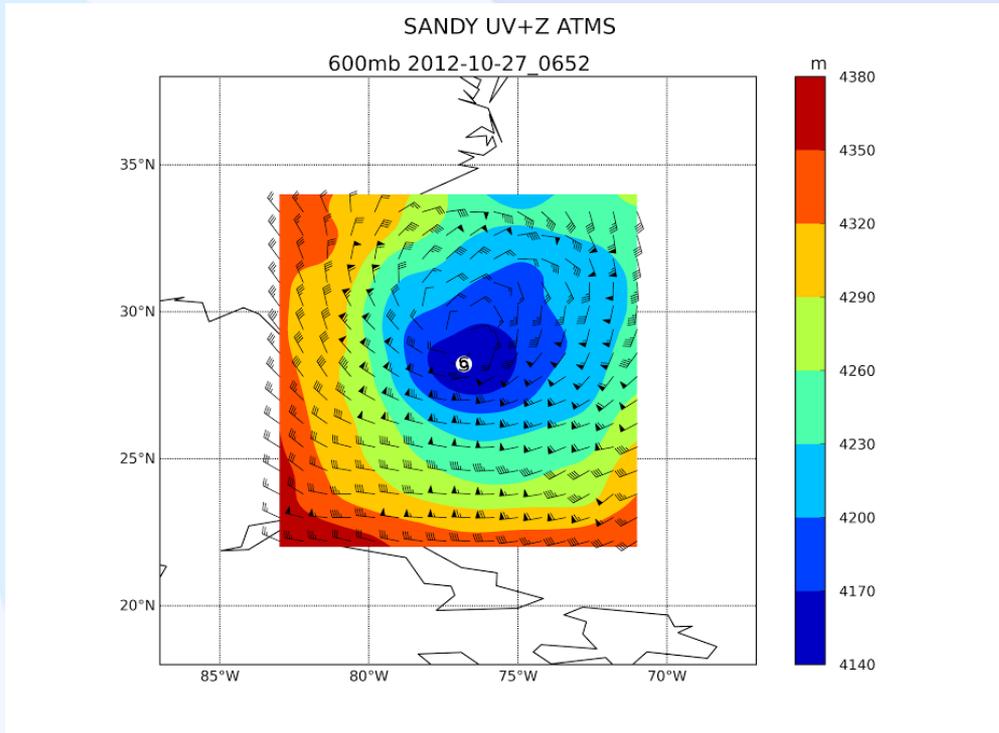
Polar Winds

- 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

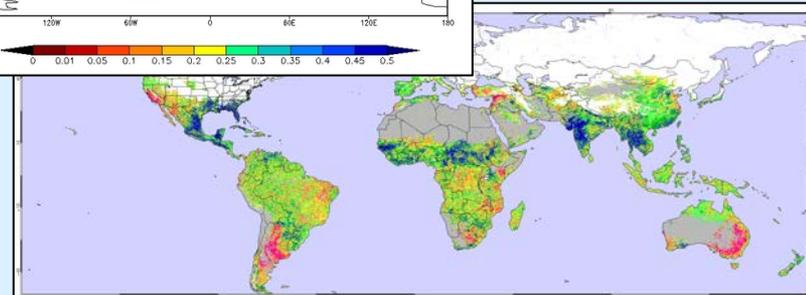
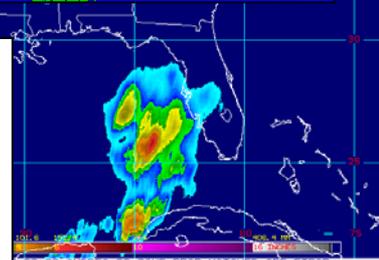
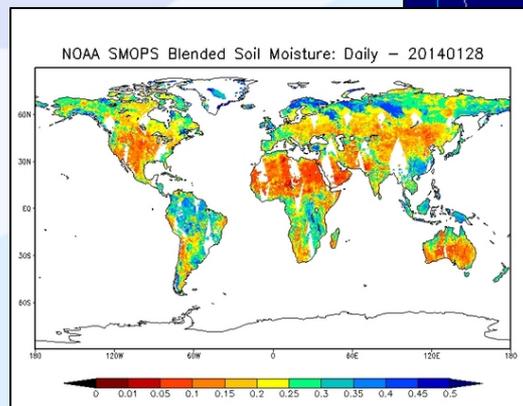
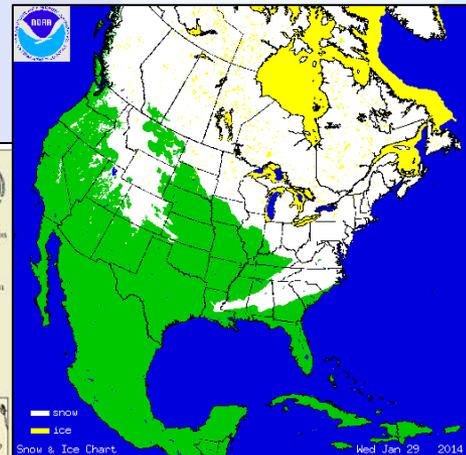
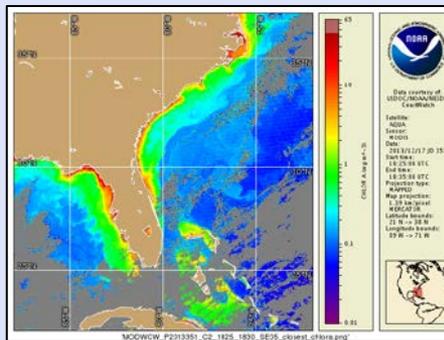




Others...



- 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**

