



# JPSS Stored Mission Data and Environmental Satellite Processing Center Products

**Session 8: 2015 STAR JPSS Science Annual Review  
August 28, 2015**

**Tom Schott  
Satellite Product Manager  
NOAA/NESDIS/OSGS**



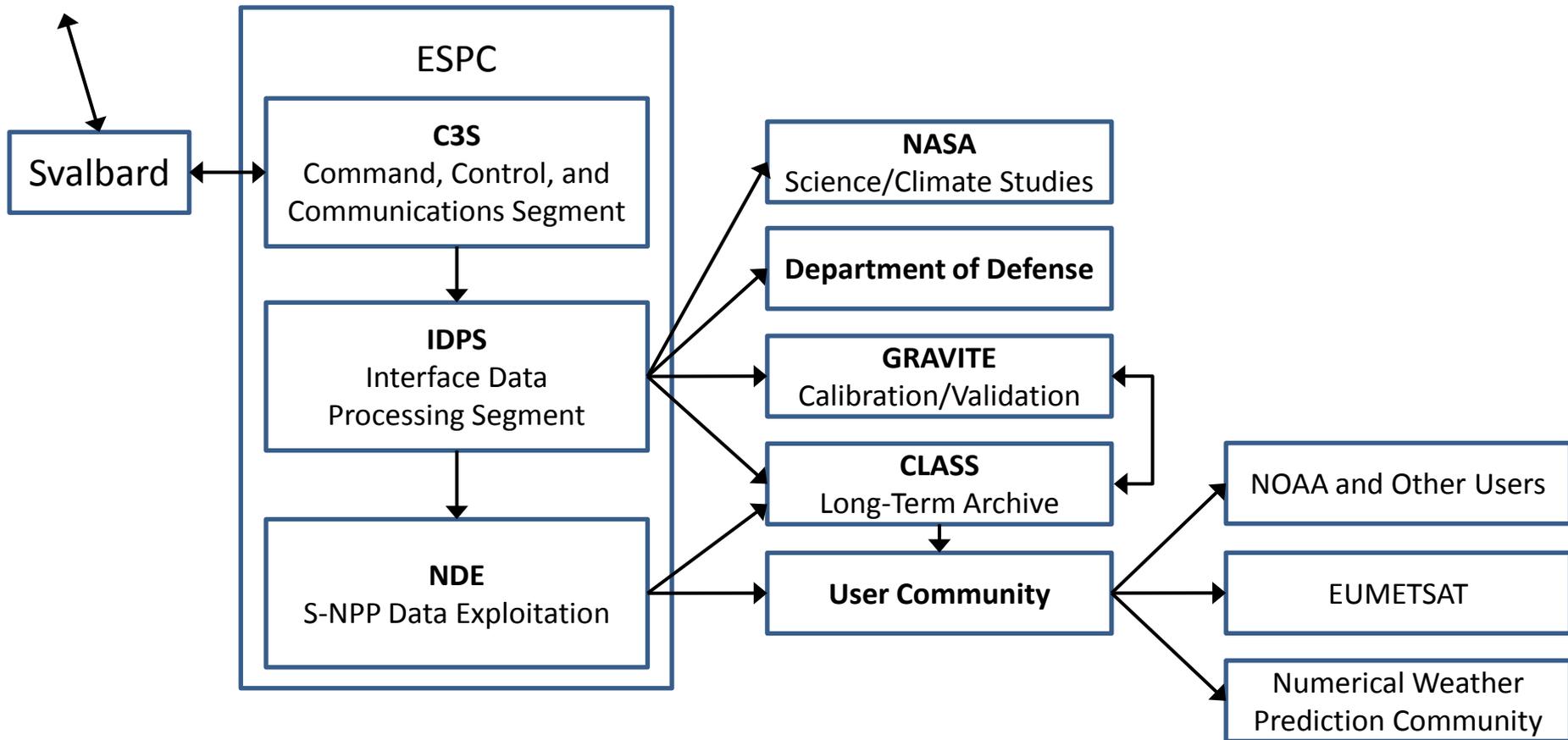
# Outline



- **S-NPP Stored Mission Data (SMD) Flow**
- **S-NPP Data Access**
- **S-NPP Environmental Satellite Processing Center (ESPC) Data Products**
- **Data Product Tailoring**



# S-NPP Stored Mission Data (SMD) Flow





# S-NPP SMD Data Flow



- **ESPC Data Processing**

- S-NPP Application Packets (APs) are downlinked at Svalbard and relayed to the ESPC within the NOAA Satellite Operations Facility (NSOF) in Suitland, MD
- IDPS processes APs into Raw Data Records (RDRs), Sensor Data Records (SDRs), Environmental Data Records (EDRs), and Intermediate Products (IPs) [collectively known as xDRs]
- NDE process the SDRs and EDRs from IDPS and generates additional data records

- **ESPC Data Distribution**

- IDPS distributes xDRs to the Comprehensive Large Array-data Steward System (CLASS) for archive, Government Resource for Algorithm Verification, Independent Test, and Evaluation (GRAVITE) for calibration and validation, Department of Defense (DoD), and NASA Science Data Segment (SDS)
- NDE distributes xDRs to real time users: National Weather Service (NWS), Authorized NOAA and NASA users, DoD, and European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), other international partners



# S-NPP Data Access

- **CLASS – Electronic library of NOAA environmental data**
  - xDRs, ancillary data, auxiliary data, and software release packages are archived
  - IPDS data delayed by 6 hours or more and normally made available to users within 24 hours
  - NDE generated data made available for archive when data is generated
  - Access: via Internet (<http://www.class.noaa.gov/>)
- **NOAA's S-NPP Data Exploitation Project**
  - Serves data to near real-time user community via [ftp-s](#)
  - Access: Submit NPP Data Access Request (DAR) form to [NESDIS.Data.Access@noaa.gov](mailto:NESDIS.Data.Access@noaa.gov)
- **Global Telecommunications Service (GTS) via EUMETSAT**
  - GTS is used for operational international exchange of meteorological data between NWP users
- **EUMETCast via EUMETSAT**
  - EUMETCast is a satellite multicast system using Digital Video Broadcasting-Satellite (DVB-S) technology
  - Access: Register for access via EUMETSAT
- **Direct Readout (X-band)**
  - The Community Satellite Processing Package (CSPP) allows for access to S-NPP data in regional areas
  - Access: Register and download software: <https://cimss.ssec.wisc.edu/cspp/download/>
- **Product Distribution and Access (PDA)**
  - PDA is a future capability

# S-NPP and GCOM-W1 Product Requirements

## Critical

### RDRs:

AMSR-2/3 ATMS CrIS VIIRS

### TDRs:

AMSR-2/3 **ATMS**

### SDRs:

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

### EDRs:

#### AMSR-2/3

Sea Surface Temperature

#### ATMS

**Land Surface Emissivity**

#### VIIRS

**Green Vegetation Fraction  
Imagery**

Ocean Color/Chlorophyll

**Polar Winds**

**Sea Surface Temperature**

#### Blended

**SST (with VIIRS)**

SST (with AMSR-2)

## Supplemental High

### RDRs:

OMPS-N

### SDRs:

OMPS-N

### EDRs:

#### AMSR-2/3

Cloud Liquid Water

Imagery

Precipitation Type/Rate

Sea Ice Characterization

Sea Surface Wind Speed

Snow Cover/Depth

Snow Water Equivalent

Soil Moisture

Total Precipitable Water

#### ATMS

**Cloud Liquid Water**

**Rainfall Rate**

**Sea Ice Concentration**

**Snow Cover**

**Snow Water Equivalent**

**Total Precipitable Water**

#### CrIS/ATMS

**Atmos. Moisture Profile**

**Atmos. Temperature Profile**

#### CrIS

**Infrared Ozone Profile**

Outgoing Longwave Radiation

#### OMPS Nadir

**Nadir Ozone Profile**

**Ozone Total Column**

#### VIIRS

**Active Fires**

**Cloud Cover/Layers**

Cloud Effective Particle Size

Cloud Mask

Cloud Optical Thickness

**Cloud Top Height**

**Sea Ice Characterization**

**Snow Cover**

Suspended Matter

#### Blended

Biomass Burning (with VIIRS)

**Rainfall Rate (with ATMS)**

Rainfall Rate (with AMSR2)

**Total Precipitable Water (with ATMS)**

Total Precipitable Water (with AMSR2)

Ozone (with OMPS NP)

**Ozone (with CrIS Ozone)**

**Snow Cover (with VIIRS)**

Snow Cover (with AMSR2)

Soil Moisture (with AMSR2)

## Supplemental Low

### EDRs:

#### AMSR-2/3

Surface Type

#### ATMS

**Imagery**

**Land Surface Temperature**

**Moisture Profile**

**Temperature Profile**

#### CrIS

Greenhouse Gases (CO, CO2, CH4)

#### VIIRS

**Aerosol Optical Thickness**

Aerosol Particle Size Parameter

Albedo (Surface)

Cloud Base Height

Cloud Top Pressure

Cloud Top Temperature

Ice Surface Temperature

Land Surface Temperature

Quarterly Surface Type

Surface Type

**Vegetation Health Product Suite**

Vegetation Indices

#### Blended

Land Surface Temperature (with VIIRS)

Green text indicates product has been declared operational in ESPC

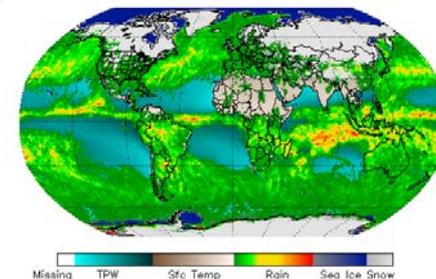


# S-NPP ESPC Product Examples



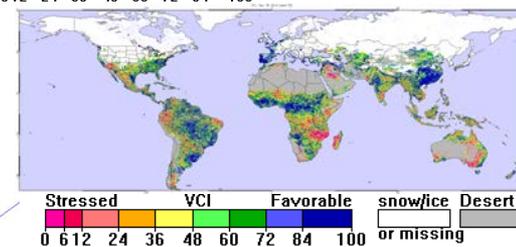
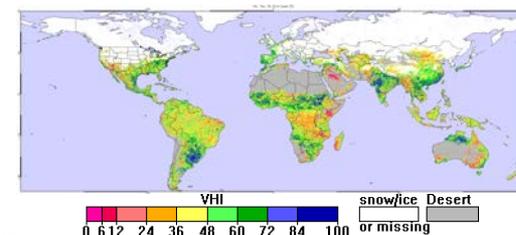
## Microwave Integrated Retrieval System (MiRS)

- MiRS provides temperature and moisture profiles, land surface temperature, land surface emissivity, snow water equivalent, snow cover, sea ice concentration, cloud liquid water, total precipitable water, ice water path, instantaneous rain water path, and rain rate products from microwave instruments in all weather and all surface conditions.
- Formats: NetCDF4
- Coverage: Global



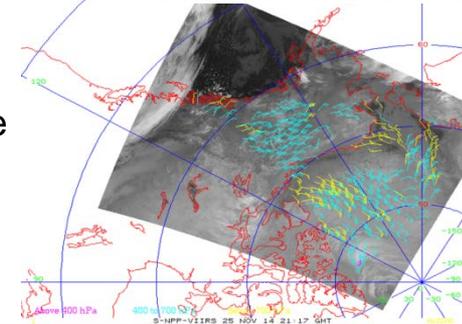
## Vegetation Health Suite (VHS)

- VHS provides vegetation health index (VHI), vegetation condition index (VCI), and temperature condition index (TCI) products which are used for drought monitoring, in global climate impact assessments, and to determine global crop production, fire risk, disaster mitigation, and food security.
- Format: NetCDF4
- Coverage: Global



## VIIRS Polar Winds (VPW)

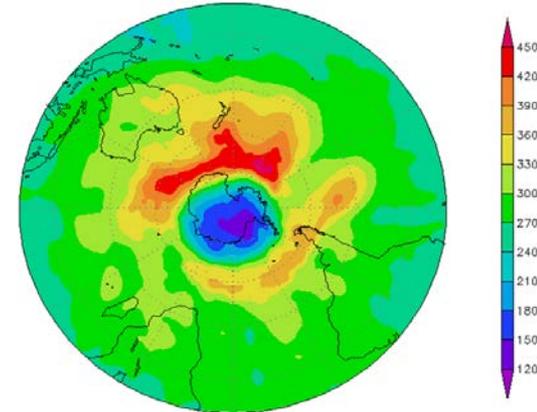
- VPW provides wind speed, direction, and height at high latitudes to be assimilated in numerical weather prediction models to improve model forecasts and improve hurricane track forecasts.
- Formats: NetCDF4, BUFR
- Coverage: Poleward of 65 degrees



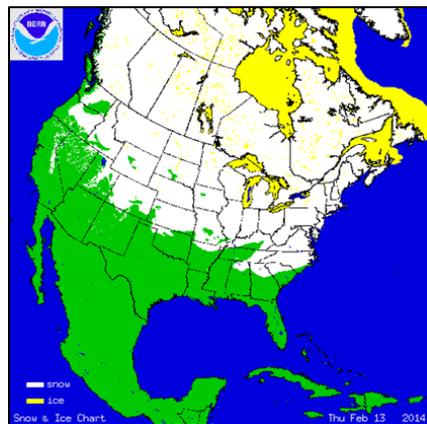
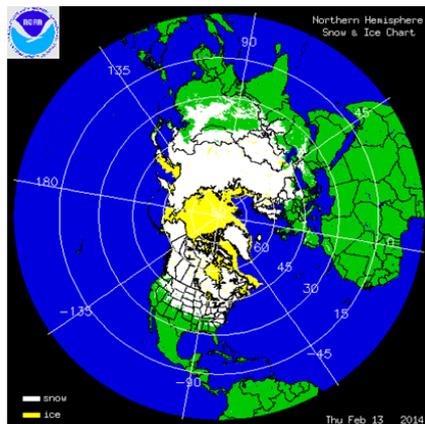
## ESPC Blended Products

- Snow Cover (with VIIRS and AMSR-2)
- Rainfall Rate (with ATMS and AMSR-2)
- Total Precipitable Water (with ATMS and AMSR-2)
- Ozone (with OMPS Nadir Profile and CrIS)
- Soil Moisture (with AMSR-2)

Southern Hemisphere TOAST Analysis on 2014296  
 SBUV/2: N19 TOVS: M1

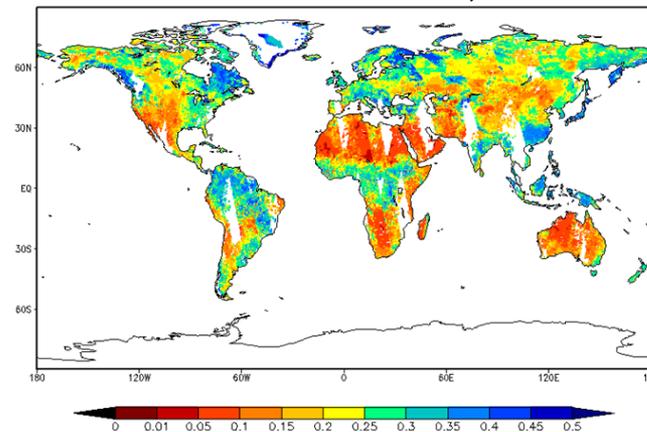


Blended Total Ozone over the Antarctic



Blended Snow and Ice Products

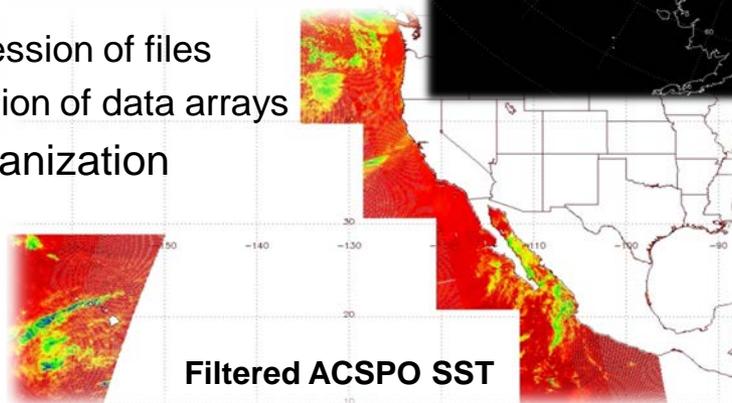
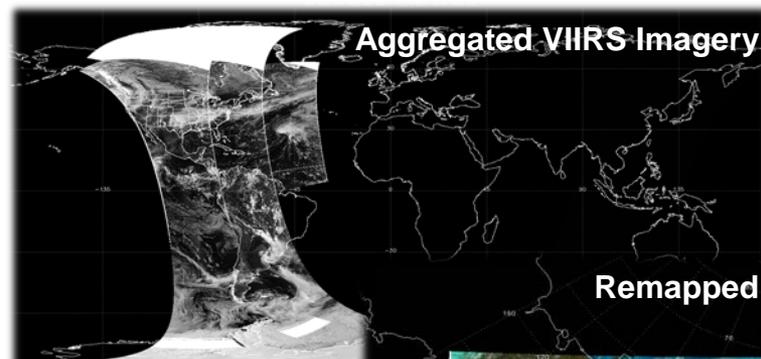
NOAA SMOPS Blended Soil Moisture: Daily - 20141029



Blended Soil Moisture

- S-NPP data products can be tailored by NDE to meet user needs
- Tailoring options include the following:

- Aggregating
- Reformatting
  - NetCDF4, GRIB2, BUFR, GeoTIFF
- Resampling
- Subsetting (i.e., thinning data files)
- Subsampling
- Remapping
- Filtering
- Compressing
  - GZIP, ZIP, ZLIB, and JPEG compression of files
  - Internal HDF5/netCDF-4 compression of data arrays
- Applying World Meteorological Organization (WMO) Headers





# Summary



- **S-NPP SMD flows from Svalbard to the ESPC and is distributed to NOAA's long term archive and to various users/consumers**
- **S-NPP SMD data can be accessed from archive and in near real time**
- **S-NPP ESPC satellite data products include atmospheric, oceanic, land, and blended products**
- **S-NPP ESPC satellite data products can be tailored to suit user-applications/needs**