



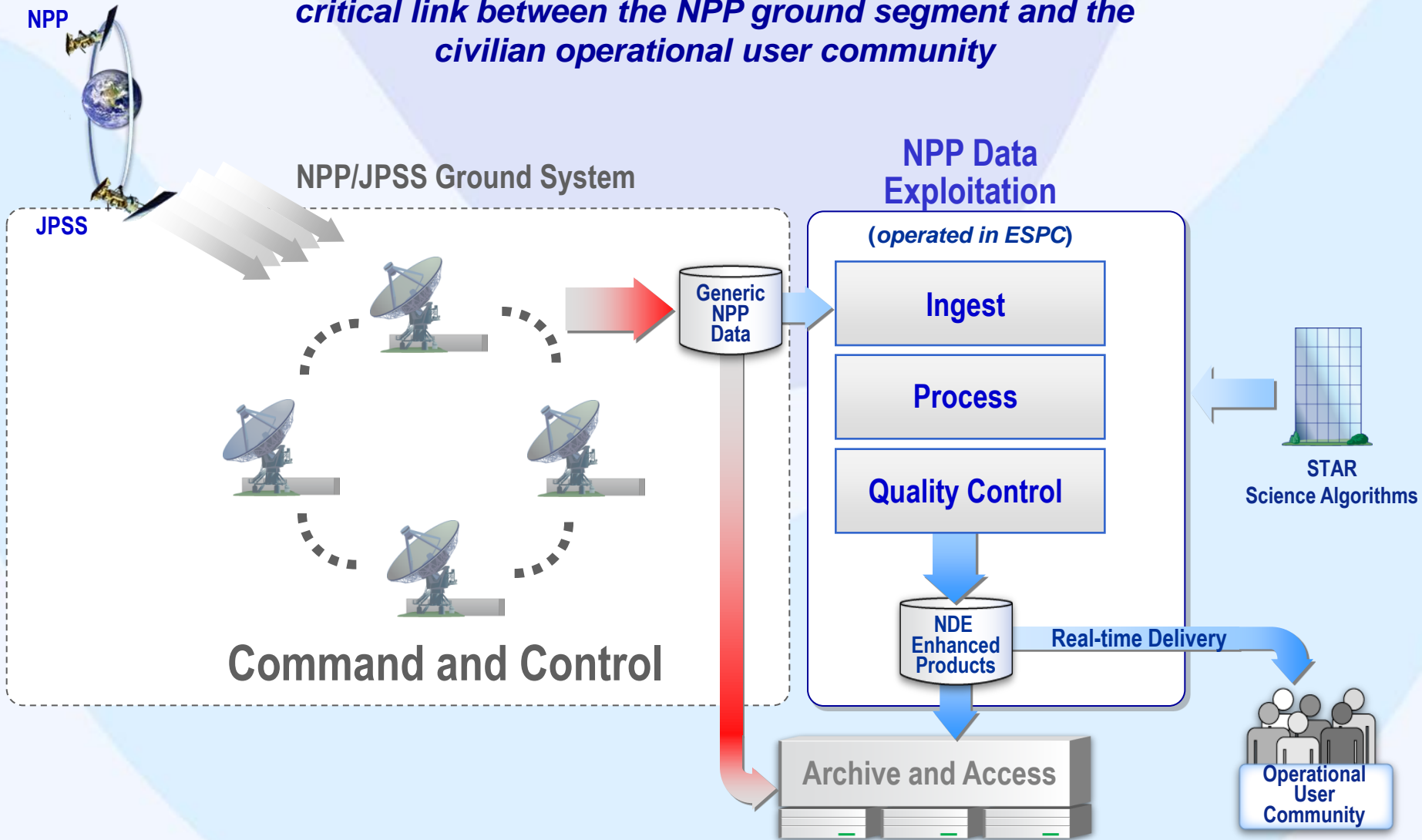
NOAA's NPOESS Preparatory Project (NPP) Data Exploitation (NDE)

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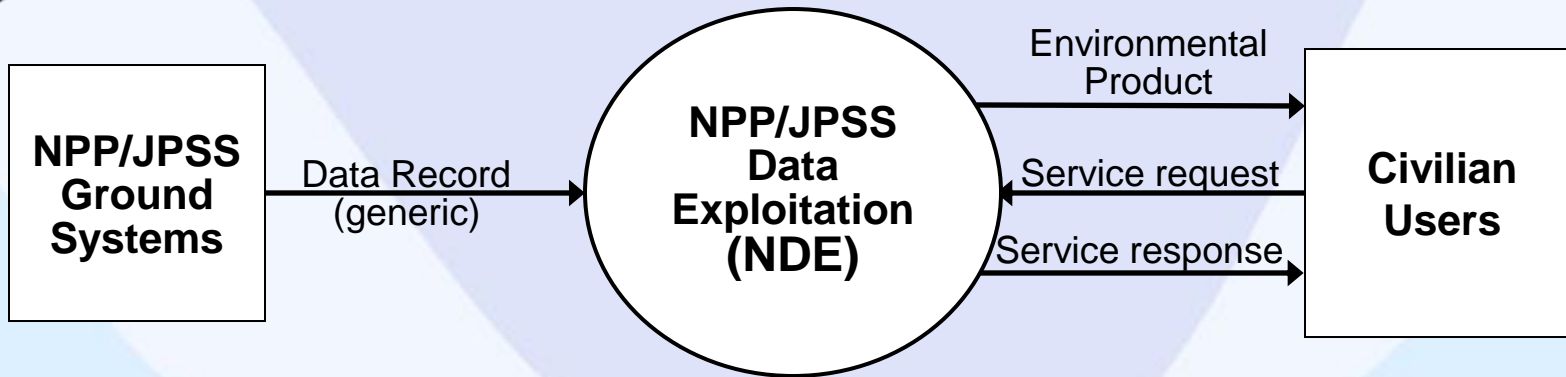
NPP Data Exploitation (NDE)

NDE is a data processing system which will provide the critical link between the NPP ground segment and the civilian operational user community

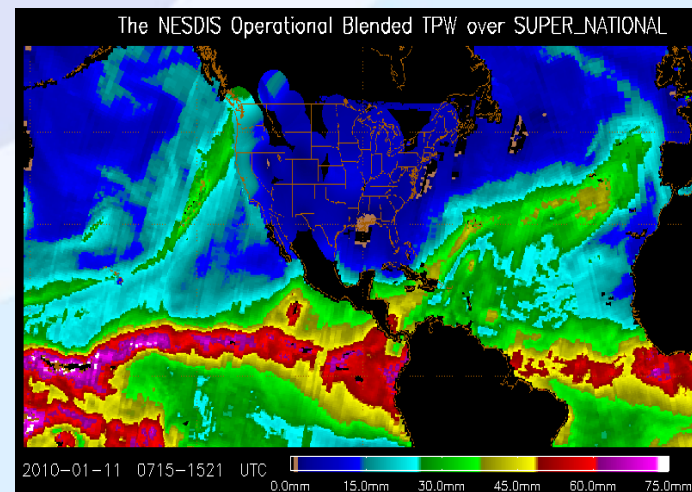




NDE Goals



- Connect civilian users to NPP/JPSS
 - Near-real time product processing
 - Near-real time product dissemination
- Provide new products and services
 - Products related to new instruments
 - New user services



NDE implements science algorithms and services to meet user requirements





NDE

- **NDE Mission**

- Provide satellite products derived from NPOESS Preparatory Project (NPP), Joint Polar Satellite System (JPSS), and Global Change Observation Mission – Water (GCOM-W1) observations to NOAA’s operational and other civilian users and to facilitate their integration into NOAA’s operational and distribution systems

- **NDE System Objectives**

- Disseminate NPP, GCOM-W1, and JPSS Data Records to users
- Generate and disseminate tailored NPP, GCOM-W1, and JPSS Data Records to users in previously agreed upon formats and views
- Generate and disseminate NOAA-unique products (NUPs) augmented from NPP, GCOM-W1, and JPSS Data Records
- Deliver NUPs, product processing elements, and associated metadata to the NOAA Long-Term Archive
- Assist with planning for the implementation of NPP, GCOM-W1, and JPSS data by user systems
- Develop a sustainable system that meets its user needs
- Provide software for NPP, GCOM-W1, and JPSS Data Record format translation and other data manipulations





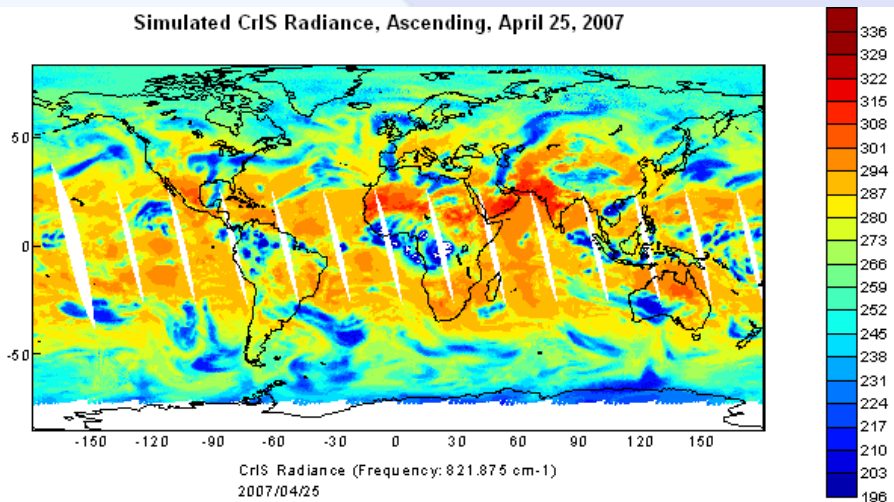
NPP NUPs

- **NOAA Unique Product Development (NUPs) are additional products developed from NPP data records (i.e., xDRs)**
 - Examples to follow
- **NDE will tailor the NUPs and JPSS delivered products to meet operational end user needs. Tailoring includes providing data in alternative formats, projections, aerial coverages, etc.**



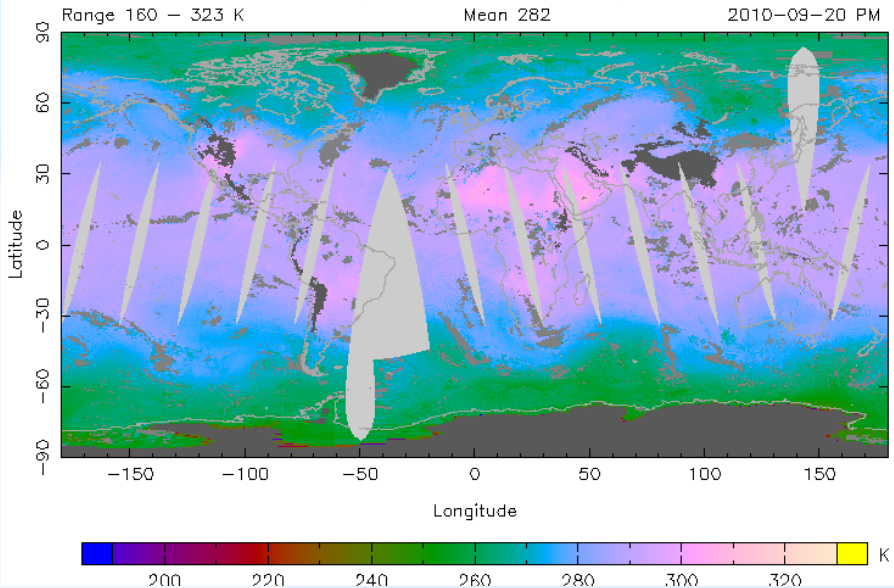
CrIS/ATMS Product System

Simulated CrIS Radiance, Ascending, April 25, 2007



CrIS Radiance (Frequency: 821.875 cm⁻¹)
2007/04/25

Temperature Level 091 (840 mb)

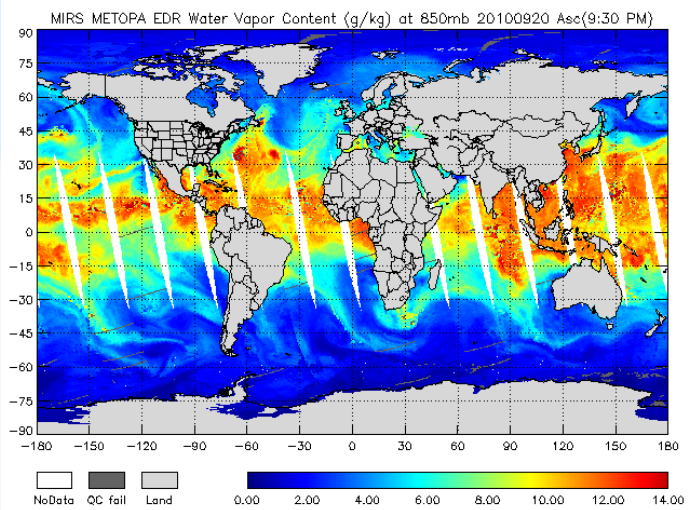
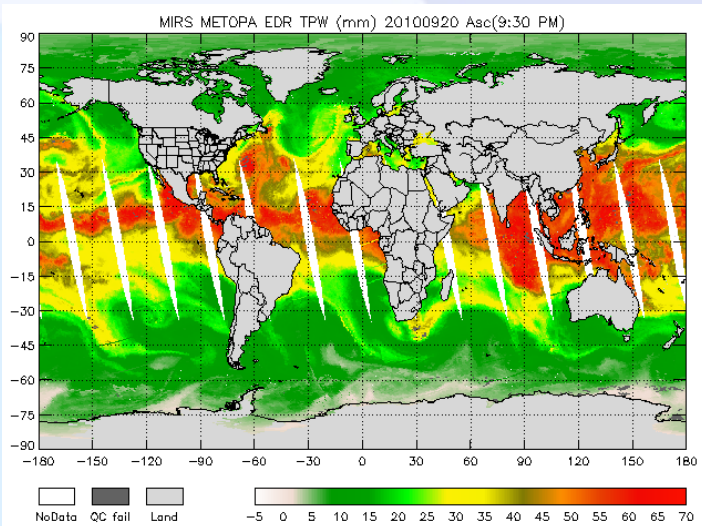


Range 160 — 323 K
Mean 282
2010-09-20 PM

Longitude

- **Continuity from**
 - Aqua AIRS and Metop IASI
- **CrIS based products**
 - Cloud cleared radiances
 - Principal components
 - Ozone
 - Trace gas retrievals (carbon dioxide, methane, and sulfur dioxide)
 - Cloud top pressure
 - Cloud top fraction
 - Atmospheric stability products
- **Users**
 - NWP and climate communities

Microwave Integrated Retrieval System (MIRS)



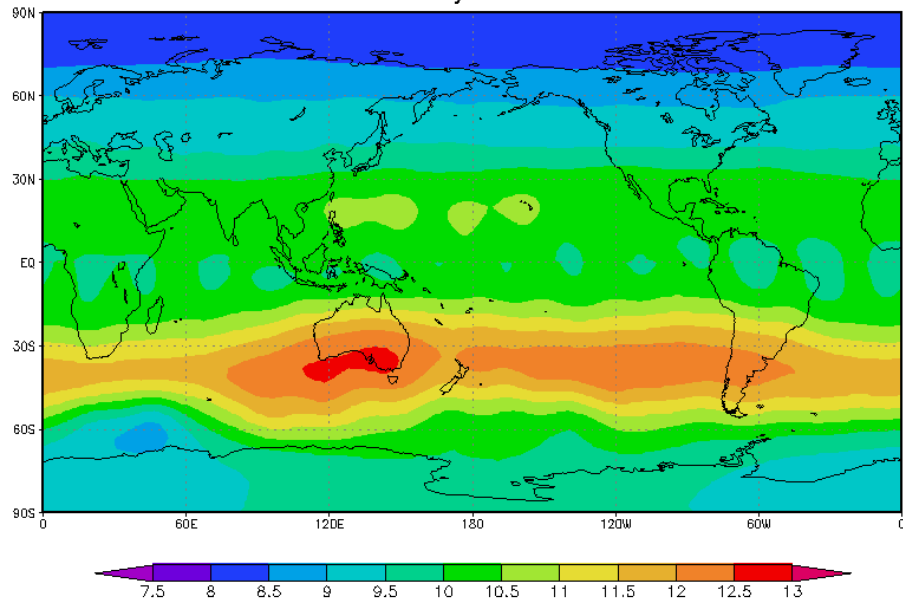
- **Continuity from**
 - POES/Metop AMSU-A and MHS, and DMSP SSMIS
- **ATMS based products**
 - Total precipitable water
 - Precipitation rate
 - Cloud liquid water
 - Snow water equivalent
 - Snow cover
 - Sea ice concentration
 - Land surface temperature
 - Land surface emissivity
 - Temperature and moisture profiles
- **Users**
 - NWS, National Ice Center, NASA, FNMOC, AFWA, Others



OMPS Limb Profiler



N17N18 Global SBUV/2 Analysis on 20110609
Layer 5

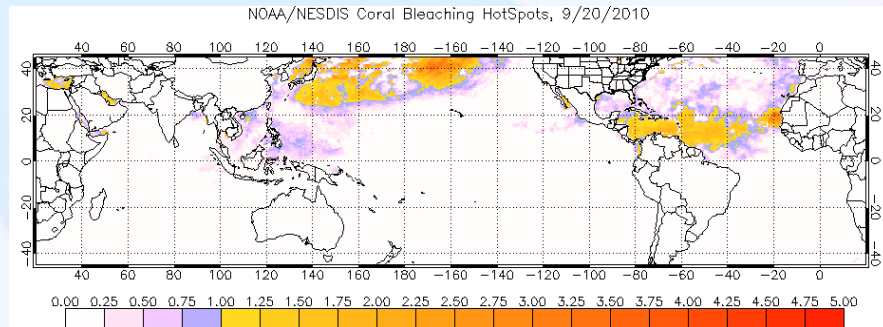
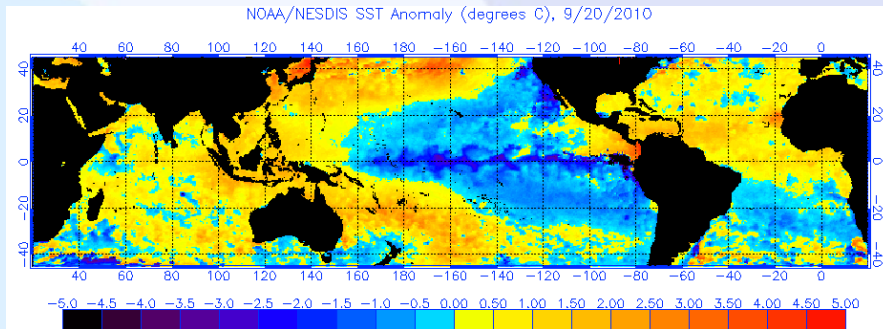


- **Continuity from**
 - POES SBUV, Metop GOME-2
- **OMPS based products**
 - Limb scattered radiances
 - High vertical resolution ozone profile
 - High vertical resolution aerosol optical depth
- **Users**
 - NWS/EMC, NWS/CPC





Sea Surface Temperature

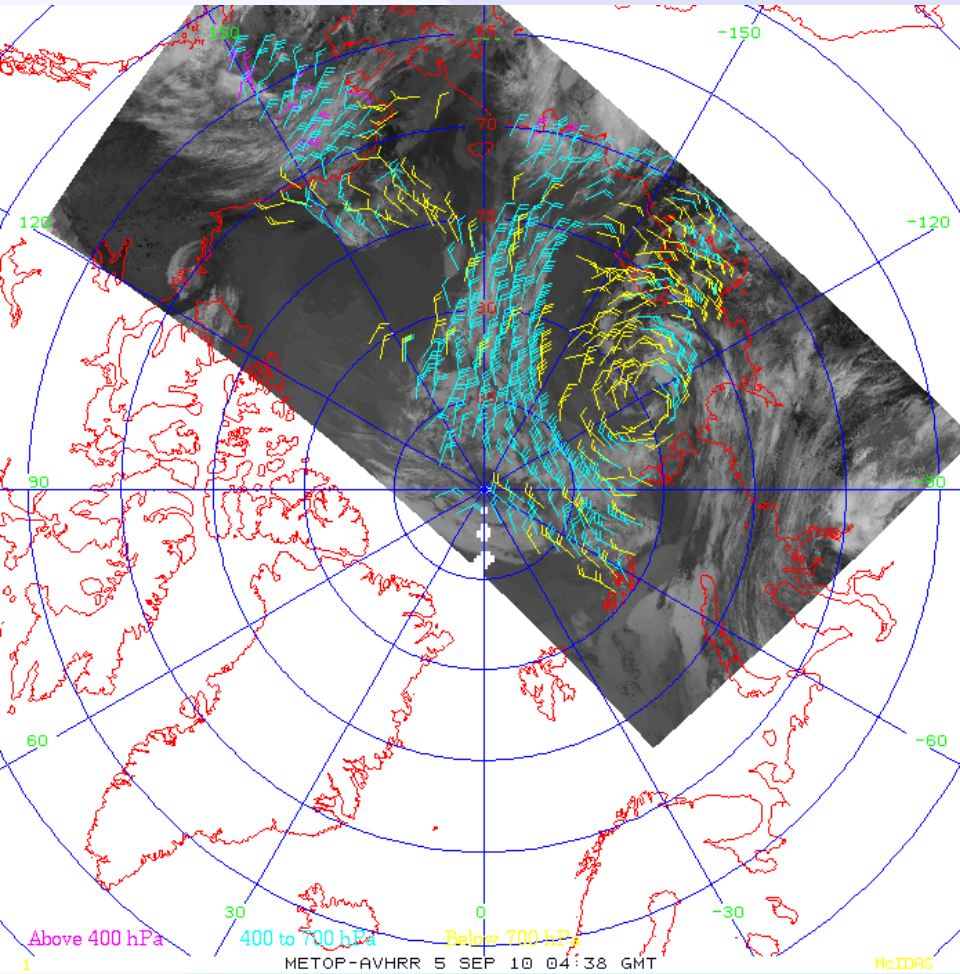


- **Continuity from**
 - POES and Metop AVHRR
- **VIIRS based products**
 - Global and regional SST analyses
 - Blended SST
 - Coral bleaching indices and alerts
 - SST anomalies
 - SST hot spots
 - Degree heating weeks
 - Aerosol optical thickness (AOT)
 - Monthly means of SST and AOT
- **Users**
 - NWS, Coral Reef Watch, CoastWatch/OceanWatch, NOS, NMFS





Polar Winds



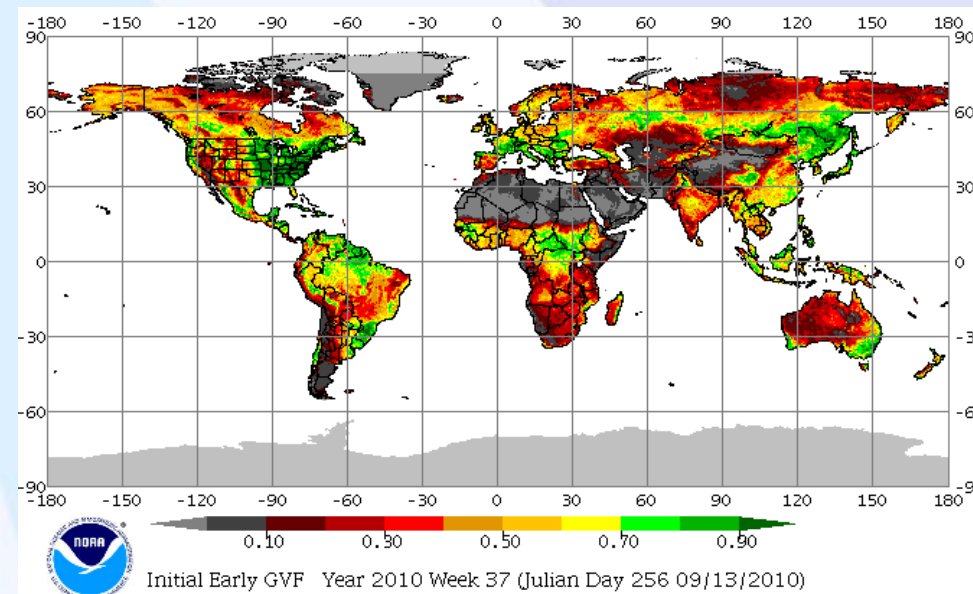
- **Continuity from**
 - Terra and Aqua MODIS and POES AVHRR
- **VIIRS based products**
 - Wind speed, direction, and height at high latitudes
- **Users**
 - NWP Centers, JCSDA, NASA





Green Vegetation Fraction

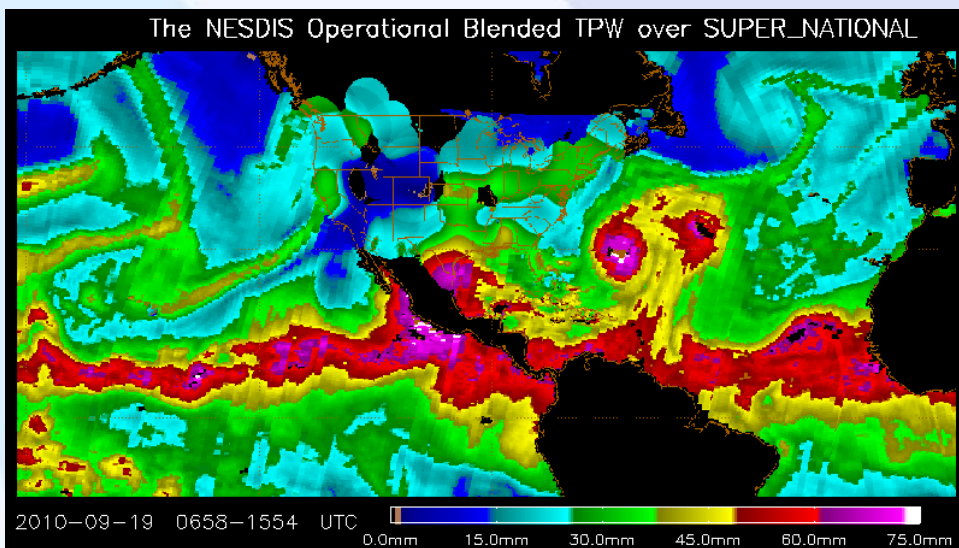
- **Continuity from**
 - POES AVHRR
- **VIIRS based product**
 - Weekly green vegetation fraction
- **Users**
 - NCEP/EMC





Blended Total Precipitable Water

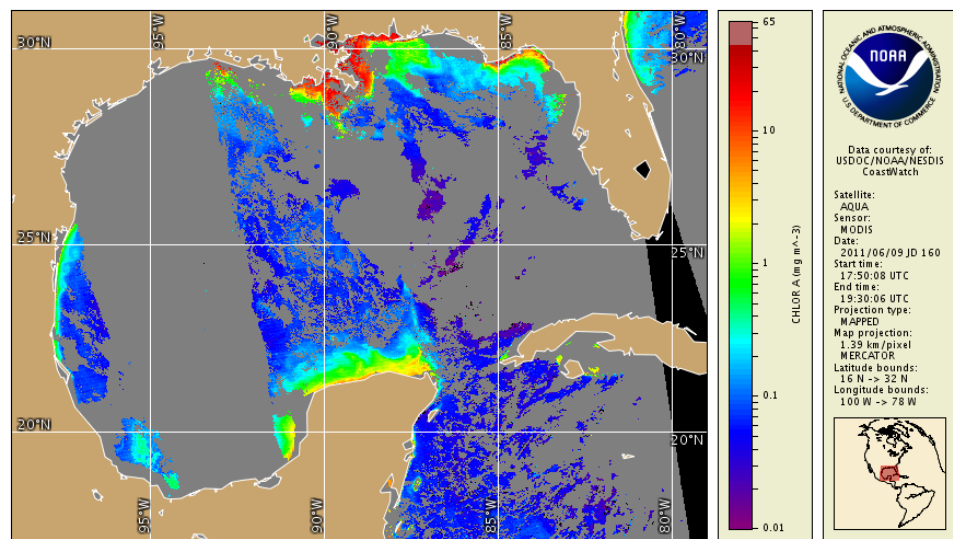
- **Continuity from**
 - TPW products from POES, DMSP, GPS-Met, GOES, TMI, Aqua
- **ATMS based data blended into existing product**
 - Total precipitable water
 - Total precipitable water anomaly
- **Users**
 - NWS/SPC, NWS/TPC, NWS/HPC, NWS/WFO (AWIPS)





Ocean Color

- **Continuity from**
 - Aqua MODIS and SeaWiFS
- **VIIRS based products**
 - Chlorophyll-a
 - Water Leaving Radiances
 - Harmful Algal Blooms
 - Chlorophyll Frontal Products
- **Users**
 - NOS, NMFS, OAR, OceanWatch





NDE Product Priorities

- **Priorities are focused on POES continuity capabilities**
 - Minimize the operational impacts should we experience a gap in the afternoon polar-orbiting satellite (i.e., NOAA-19)
 - Enhance capabilities by exploiting improved NPP sensors





NDE Product Priorities List

- Blue cells = JPSS contractor delivered products (referred to as xDRs)
- Yellow cells = NOAA Unique Product (NUPs)
- Red text = satellite product development has not started
- NDE Ops Planning Date = products reach operational status

#	Product Priority	NDE Ops Planning Date	NPP	GCOM-W1
1	ATMS Radiances	Jul-12	X	--
2	<i>ATMS Radiances (BUFR)</i>	Jul-12	X	--
3	Sea Surface Temperature (SST)	Jan-13	X	--
4	CrIS Radiances	Jul-12	X	--
5	<i>CrIS Radiances (BUFR)</i>	Jul-12	X	--
6	OMPS Radiances	Sep-12	X	--
7	Nadir Profile Ozone	Apr-13	X	--
8	Ozone Total Column	Apr-13	X	--
9	<i>Ozone (BUFR)</i>	Apr-13	X	--
10	VIIRS Radiances	Jul-12	X	--
11	<i>VIIRS Radiances (BUFR)</i>	Jul-12	X	--
12	AMSR-2 Radiances	Sep-13	--	X
13	Snow Cover	Apr-13	X	--
14	<i>Blended Snow Cover</i>	Dec-13	X	--
15	Aerosol Optical Thickness	Apr-13	X	--
16	<i>Aerosol Optical Thickness (BUFR)</i>	Apr-13	X	--
17	<i>Sea Surface Temperature (SST) (BUFR)</i>	Jan-13	X	--
18	<i>Polar Winds (VIIRS)</i>	Oct-12	X	--
19	Sea Surface Wind Speed (GCOM)	Sep-13	--	X
20	<i>Green Vegetation Fraction</i>	Aug-12	X	--





NDE Product Priorities List (Cont)

#	Product Priority	NDE Ops Planning Date	NPP	GCOM-W1
21	AMSR-2 SDR	Sep-13	--	X
22	AMSR-2 Radiances (BUFR)	Dec-13	--	X
23	Rainfall Rate (ATMS)	Jul-12	X	--
24	Total Precipitable Water (ATMS)	Jul-12	X	--
25	Precipitable Water (GCOM)	Sep-13	--	X
26	Precipitation (Type/Rate) GCOM	Sep-13	--	X
27	Blended Total Precipitable Water	Jul-12	X	
28	Blended Total Precipitable Water (GCOM)	Sep-14	--	X
29	Blended Total Precipitable Water Anomaly	Jul-12	X	
30	Blended Total Precipitable Water Anomaly (GCOM)	Sep-14		X
31	Blended Rain Rate	Jul-12	X	
32	Blended Rain Rate (GCOM)	Sep-14		X
33	Tropical Rainfall Potential	Sep-14	X	
34	Tropical Rainfall Potential (GCOM)	Sep-14		X
35	Tropical Cyclone Intensity	Jan-14	X	
36	Tropical Cyclone Intensity (GCOM)	Sep-14		X
37	Blended SST (Imagery)	Feb-13	X	--
38	Sea Surface Temperature (GCOM)	Sep-13	--	X
39	Blended SST (GCOM)	Sep-14	--	X
40	SST Anomalies	Feb-13	X	--
41	SST Degree Heating Weeks	Feb-13	X	--
42	SST Hot Spots	Feb-13	X	--
43	Coral Reef Bleaching Indices/Alerts	Feb-13	X	--





NDE Product Priorities List (Cont)

#	Product Priority	NDE Ops Planning Date	NPP	GCOM-W1
44	Active Fires	Apr-13	X	--
45	Ocean Color/Chlorophyll	Apr-13	X	--
46	<i>Normalized Water Leaving Radiances</i>	Mar-14	X	--
47	<i>Chlorophyll a (5 tailored regions)</i>	Mar-14	X	--
48	<i>Harmful Algal Bloom Anomaly</i>	Mar-14	X	--
49	<i>Emiliana huxleyi Bloom</i>	Mar-14	X	--
50	<i>Chesapeake Bay Ocean Color</i>	Mar-14	X	--
51	<i>Near Coast Ocean Color (SWIR)</i>	Mar-14	X	--
52	<i>CrIS Cloud Cleared Radiances</i>	Jan-13	X	--
53	VIIRS Imagery	Oct-12	X	--
54	Soil Moisture GCOM	Sep-13	--	X
55	<i>Blended Soil Moisture (GCOM)</i>	Sep-14	--	X
56	Cloud Cover/Layers	Apr-13	X	--
57	Cloud Mask	Apr-13	X	--
58	Atmospheric Temperature Profile	Apr-13	X	--
59	<i>Atmospheric Temperature Profile (CrIS/ATMS)</i>	Jan-13	X	--
60	Atmospheric Moisture Profile	Apr-13	X	--
61	<i>Atmospheric Moisture Profile (CrIS/ATMS)</i>	Jan-13	X	--
62	<i>Snow Cover (ATMS)</i>	Jul-12	X	--
63	<i>Land Surface Emissivity (ATMS)</i>	Jul-12	X	--
64	<i>Temperature Profiles (ATMS)</i>	Jul-12	X	--
65	<i>Moisture Profiles (ATMS)</i>	Jul-12	X	--
66	<i>Cloud Liquid Water (ATMS)</i>	Jul-12	X	--
67	<i>Sea Ice Concentration (ATMS)</i>	Jul-12	X	--





NDE Product Priorities List (Cont)

#	Product Priority	NDE Ops Planning Date	NPP	GCOM-W1
68	Sea Ice Characterization (GCOM)	Sep-13	--	X
69	Snow Cover/Depth (GCOM)	Sep-13	--	X
70	Snow Water Equivalent (GCOM)	Sep-13	--	X
71	<i>Snow Water Equivalent (ATMS)</i>	Jul-12	X	--
72	<i>Ice Water Path (ATMS)</i>	Jul-12	X	--
73	<i>Land Surface Temperature (ATMS)</i>	Jul-12	X	--
74	<i>Rain Water Path (ATMS)</i>	Jul-12	X	--
75	<i>Ozone Limb Profile Radiances</i>	Jun-13	X	--
76	<i>Ozone Profile (OMPS LP)</i>	Jun-13	X	--
77	<i>Ozone (CrIS)</i>	Jan-13	X	--
78	<i>Blended Ozone</i>	Apr-14	X	--
79	Suspended Matter	Apr-13	X	--
80	<i>Fire & Smoke Analysis</i>	Sep-13	X	--
81	<i>Volcanic Ash</i>	Sep-13	X	--
82	<i>Outgoing Longwave Radiation (CrIS)</i>	Jan-13	X	--
83	Vegetation Index	Apr-13	X	--
84	Land Surface Type	Apr-13	X	--
85	Quarterly Surface Type Gridded	Apr-13	X	--
86	Surface Type (GCOM)	Sep-13	--	X
87	Surface Albedo	Apr-13	X	--
88	Aerosol Particle Size	Apr-13	X	--
89	Cloud Top Temperature	Apr-13	X	--
90	Cloud Top Pressure	Apr-13	X	--





NDE Product Priorities List (Cont)

#	Product Priority	NDE Ops Planning Date	NPP	GCOM-W1
91	Cloud Effective Particle Size	Apr-13	X	--
92	Cloud Optical Thickness	Apr-13	X	--
93	Cloud Top Height (VIIRS)	Apr-13	X	--
94	Cloud Base Height	Apr-13	X	--
95	Land Surface Temperature (VIIRS)	Apr-13	X	--
96	Sea Ice Characterization (VIIRS)	Apr-13	X	--
97	Ice Surface Temperature	Apr-13	X	--
98	Atmospheric Pressure Profile	Apr-13	X	--
99	<i>Stability Products (CrIS)</i>	Jan-13	X	--
100	<i>Trace Gases (Carbon Dioxide, Methane, Sulfur Dioxide)</i>	Jan-13	X	--
101	<i>SST (AVHRR-like)</i>	Jan-13	X	--
102	<i>Clear Sky Brightness Temperatures</i>	Jan-13	X	--
103	<i>Aerosol Optical Depth (AVHRR-like)</i>	Jan-13	X	--
104	<i>Ocean Optimized Cloud Mask</i>	Jan-13	X	--
105	<i>Cloud Top Fraction (CrIS)</i>	Jan-13	X	--
106	<i>Cloud Top Pressure (CrIS)</i>	Jan-13	X	--
107	<i>Aerosol Optical Depth (OMPS LP)</i>	Jun-13	X	--





Summary

- **NDE is developing capabilities to provide users with continuity of data from current POES, DMSP, and EOS missions**
- **NDE will tailor NPP, JPSS, and GCOM-W products for NOAA's operational user community**
- **NDE will develop and implement additional products from NPP, JPSS, and GCOM-W as new user requirements are defined and validated**

