



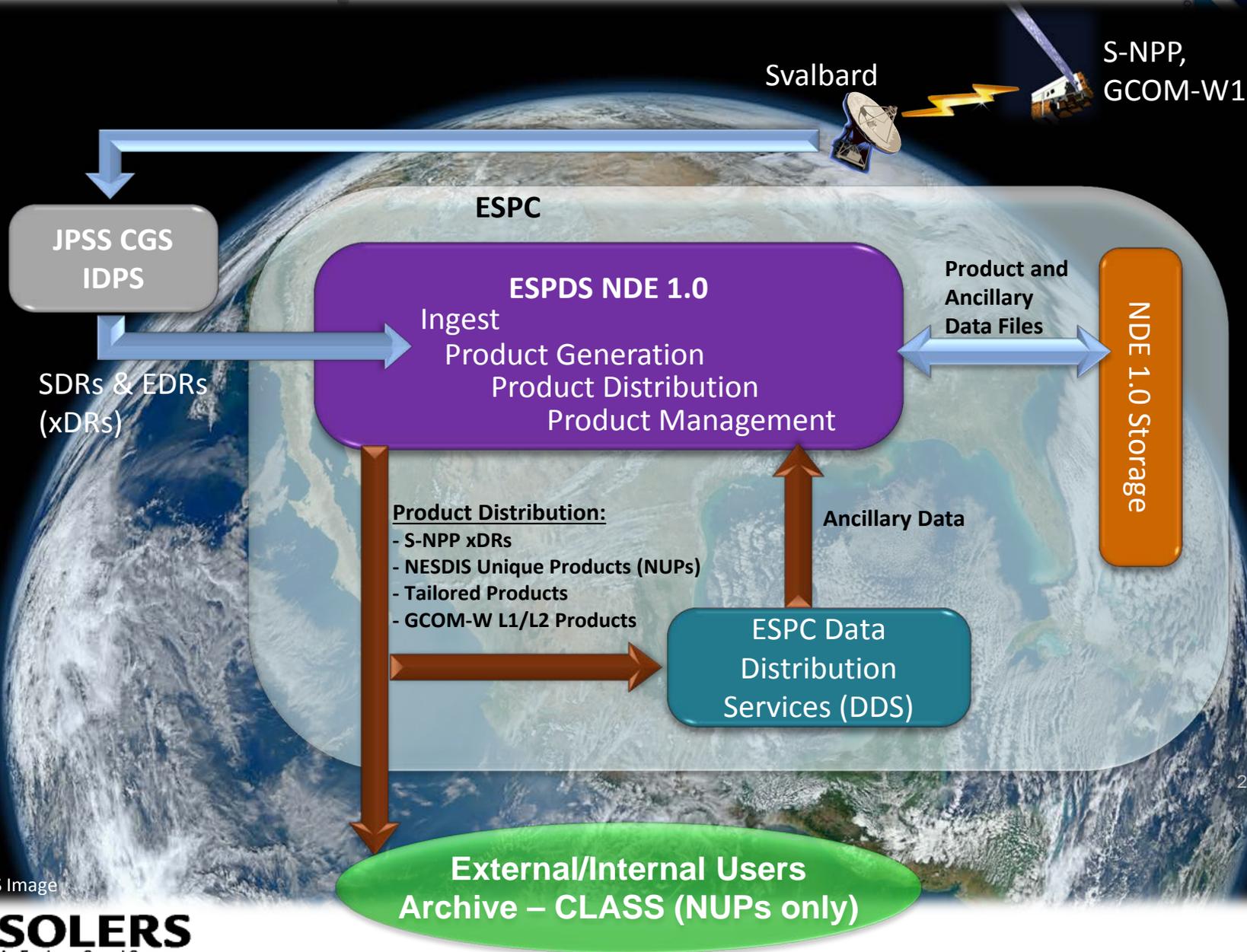
NOAA ESPDS – NDE

Transition of Science Algorithms into Enterprise Product Generation Operations 2016 AMS Annual Meeting

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NDE 1.0 Operations



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NASA VIIRS Image

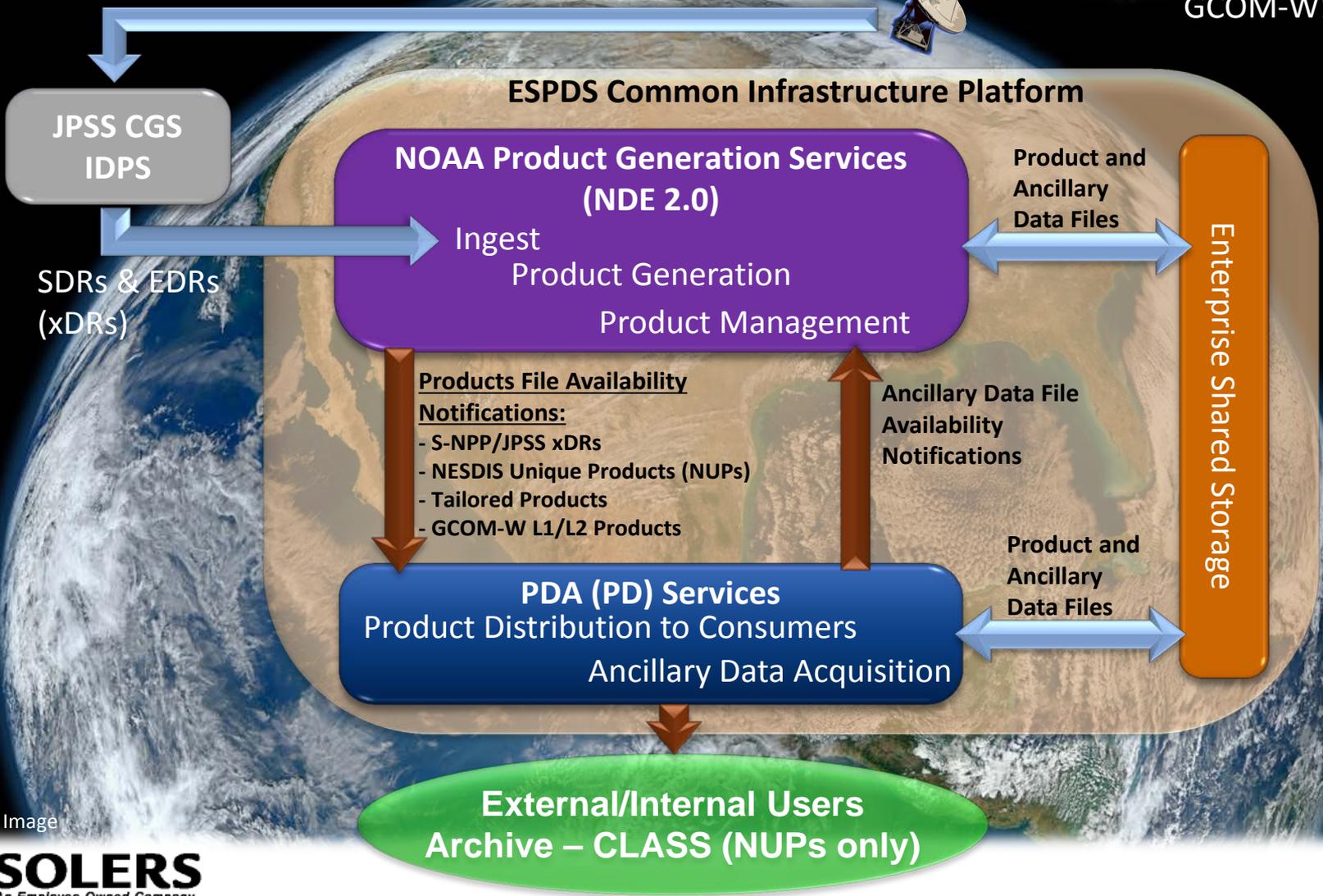


ESPDS Product Generation (NDE 2.0)



Svalbard/Fairbanks/
McMurdo

S-NPP,
JPSS-1/2,
GCOM-W1



3

NASA VIIRS Image





NOAA Product Generation (PG)

- ▶ NOAA Data Exploitation (NDE) 1.0 in operations since July 2014 and has been distributing critical S-NPP data since soon after launch (November 2011)
- ▶ NDE 2.0 provides an Enterprise Product Generation (PG) framework implemented in a SOA within the ESPDS common infrastructure platform
- ▶ Established and mature process for efficiently transitioning new and updated science algorithms from the NOAA Center for Satellites Applications and Research (STAR) - in place since 2011
- ▶ Well defined, documented, and simple interface for “plug-and-play” algorithm integration allowing for a repeatable process and small integration team
- ▶ Data agnostic, execute algorithms for any platform/instrument (***“algorithm as a service” concept***)
- ▶ Established solution for product generation for S-NPP, JPSS-1/2, GCOM-W1, and can be leveraged for other NOAA or non-NOAA missions

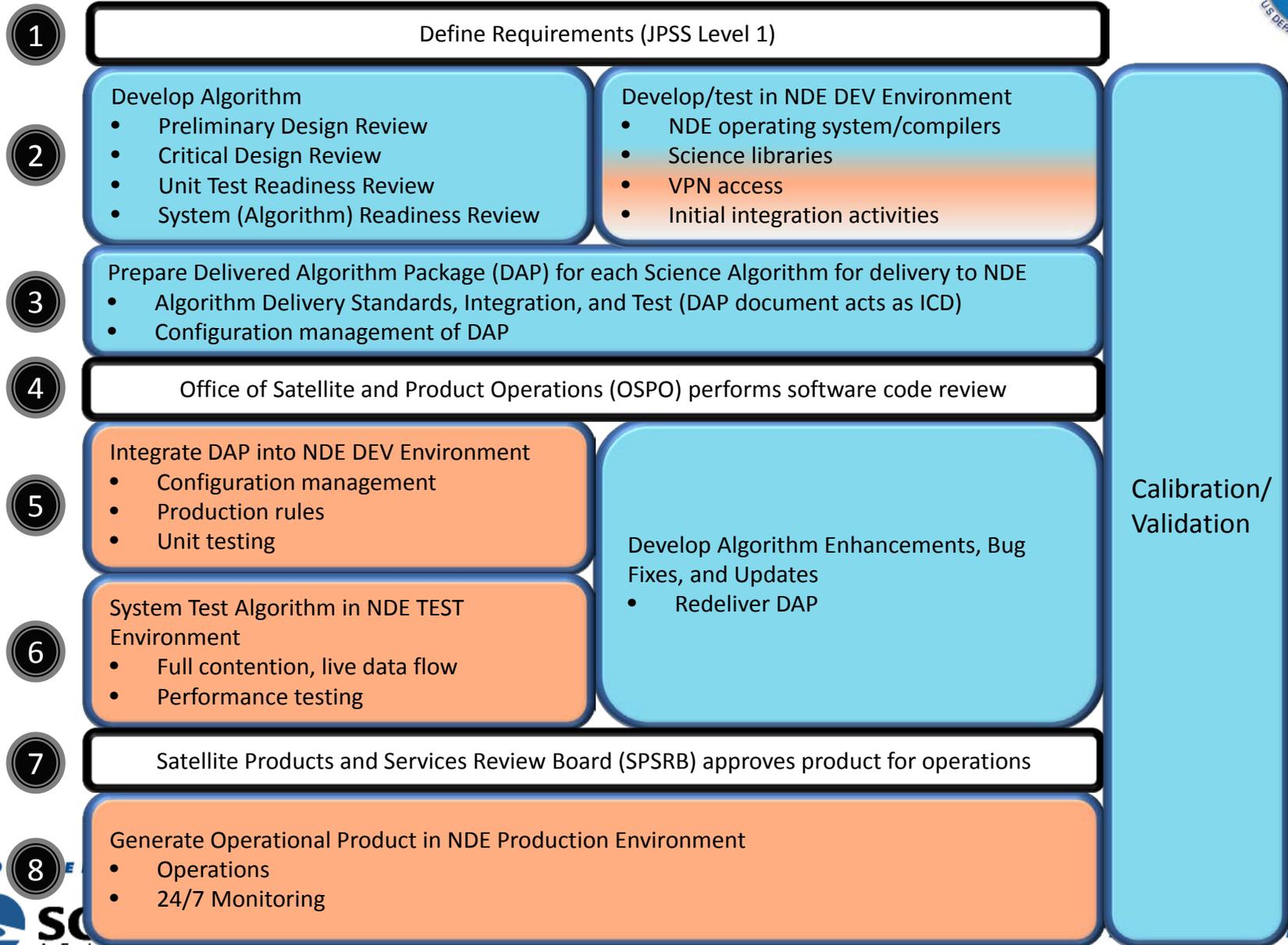
NDE 1.0 Operations

30 Day Performance



Ingest	Dec 2014	Dec 2015
Ingested Data	103 TB	111 TB
Product Generation		
Number of Production Jobs	1,510,997	1,591,465
Generated Data	25 TB	27 TB
Production Job Success Rate	99.992%	99.990%
Product Distribution		
Distributed Data	29 TB	34 TB
Subscription Based Services		
Number of Users	29	34
Number of Subscriptions (active)	254	375

NOAA PG Transition to Operations Process



NOAA PG Algorithm Interface



NOAA Data Exploitation (NDE) PG

Science Algorithm

- Single Driver Script
- Read Process Control File (PCF)
- Write output files to Process Status File (PSF)

Science Algorithm

- Log warnings and errors to master log file
- Return code

Working Directory

- Temporary directory for execution of production job
- Dynamic input data
- Write the PCF

Working Directory

- Destroyed after successful execution
- Failed jobs cause directory to be stored for later analysis

PCF
PSF
Logs
Return Code

PCF
PSF
Logs
Return Code

Input/Output Data

Input/Output Data

Enterprise Shared Storage

ESPDS Common Infrastructure Platform

Input Data



NOAA Product Generation Algorithms

Algorithm	Platform/Primary Instrument	NDE 1.0 Operations Status	ESPDS PG (NDE 2.0) Baseline
Microwave Integrated Retrieval System (MiRS)	S-NPP/ATMS	Operational 2014	QST-1
Advanced Clear-Sky Processor for Oceans (ACSPO)	S-NPP/VIIRS	Operational 2014	QST-1
NOAA Unique CrIS/ATMS Processing System (NUCAPS)	S-NPP/CrIS	Operational 2014	QST-1
VIIRS Polar Winds (VPW)	S-NPP/VIIRS	Operational 2014	QST-1
Green Vegetation Fraction (GVF)	S-NPP/VIIRS	Operational 2014	QST-1
S-NPP Tropical Cyclone	S-NPP/ATMS	Operational 2015	QST-1
Vegetation Health (VH)	S-NPP/VIIRS	Operational 2015	QST-1
GCOM-W1 AMSR2 Algorithm Software Processor (GAASP)	GCOM-W1/AMSR2	Operational 2015	QST-1
Active Fires (AF)	S-NPP/VIIRS	Operational 2016	QST-2
OMPS-Limb Profiler SDR	S-NPP/OMPS-LP	Operational 2016	ORR



ESPDS Product Generation Algorithms

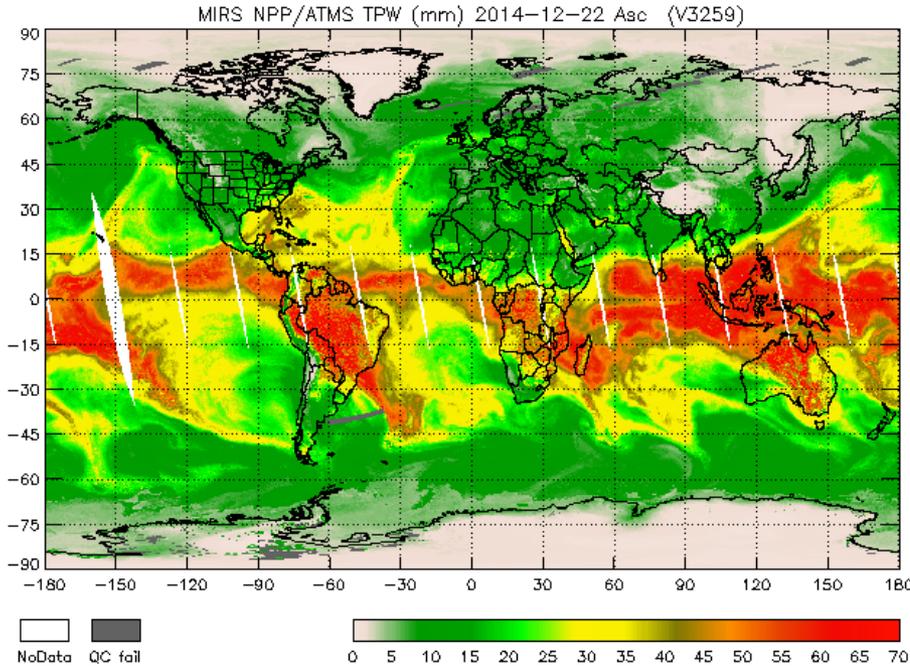
Algorithm	Platform/Primary Instrument	NDE 1.0 Operations Status	ESPDS PG (NDE 2.0) Baseline
OMPS-Limb Profiler EDR	S-NPP/OMPS-LP	Operational 2016	ORR
JPSS Risk Reduction (Clouds, Aerosols, Cryosphere)	S-NPP, JPSS/VIIRS	N/A	QST-1
GCOM-W1 AMSR2 SDR	GCOM-W1/AMSR2	N/A	QST-1

NDE Product Generation

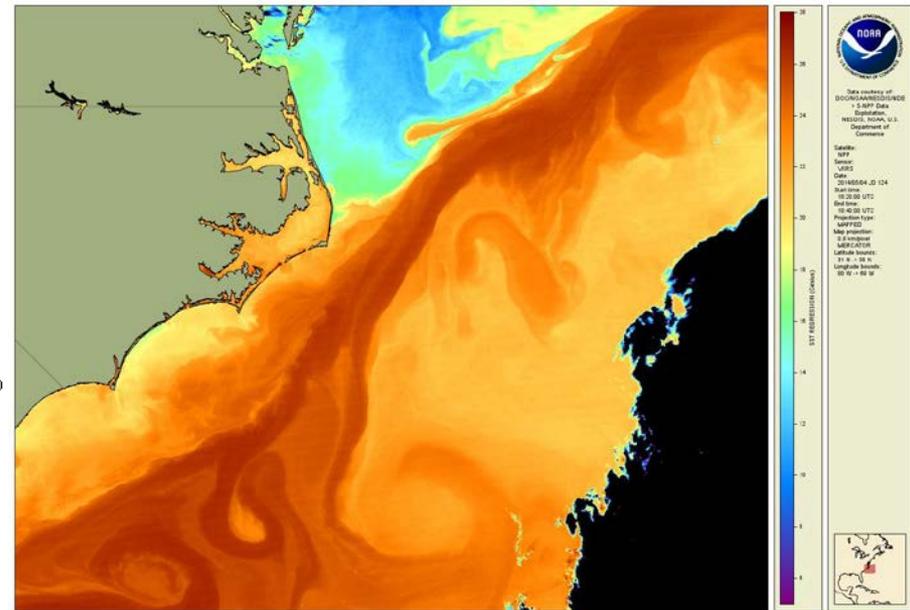
Operational Science Applications



Total Precipitable Water



Sea Surface Temperature



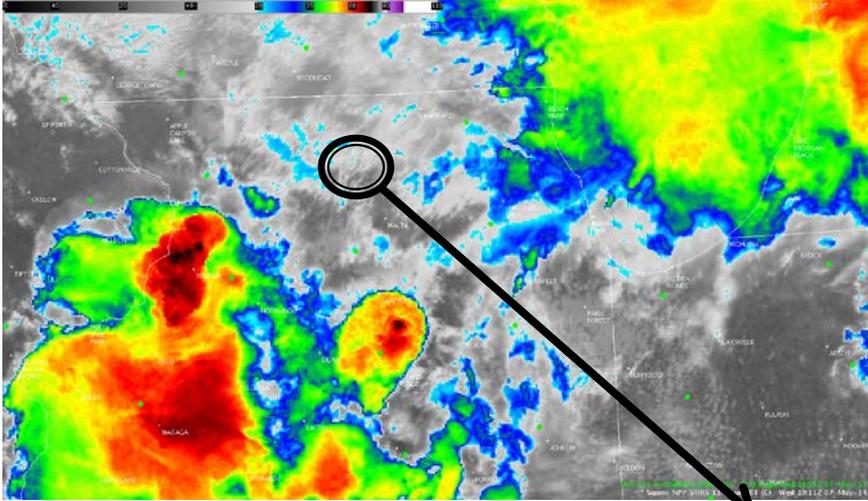
Microwave Integrated Retrieval System (MiRS)

Advanced Clear-Sky Processor for Oceans (ACSPO)



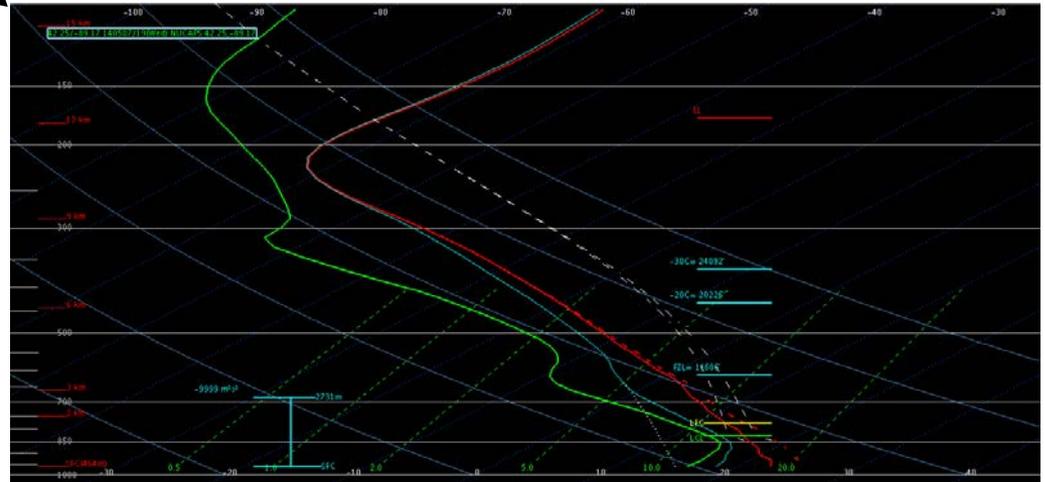
NDE Product Generation

Operational Science Applications



VIIRS IR Image

AWIPS2 NUCAPS Sounding

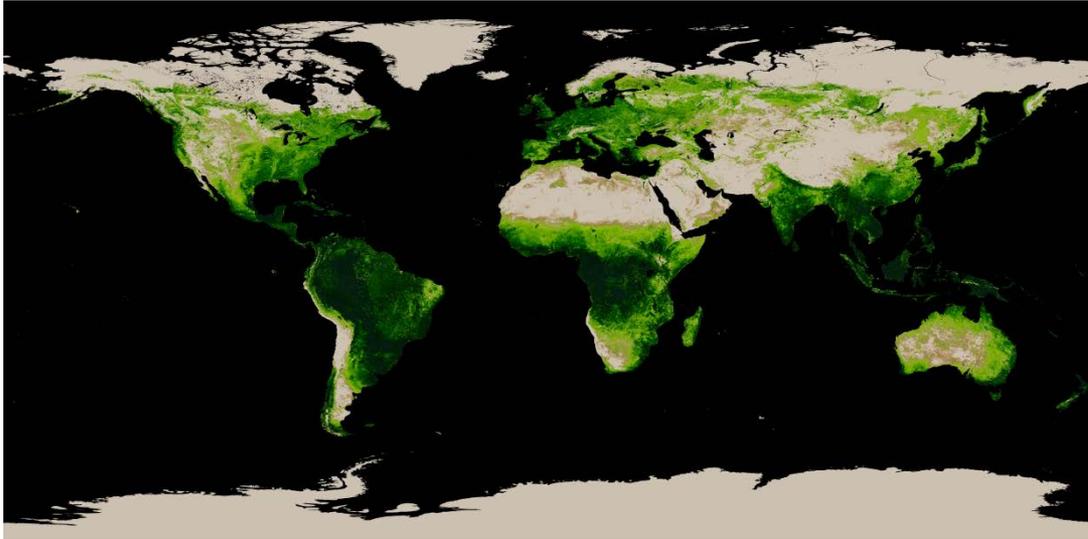


NOAA Unique CrIS/ATMS Processing System (NUCAPS)

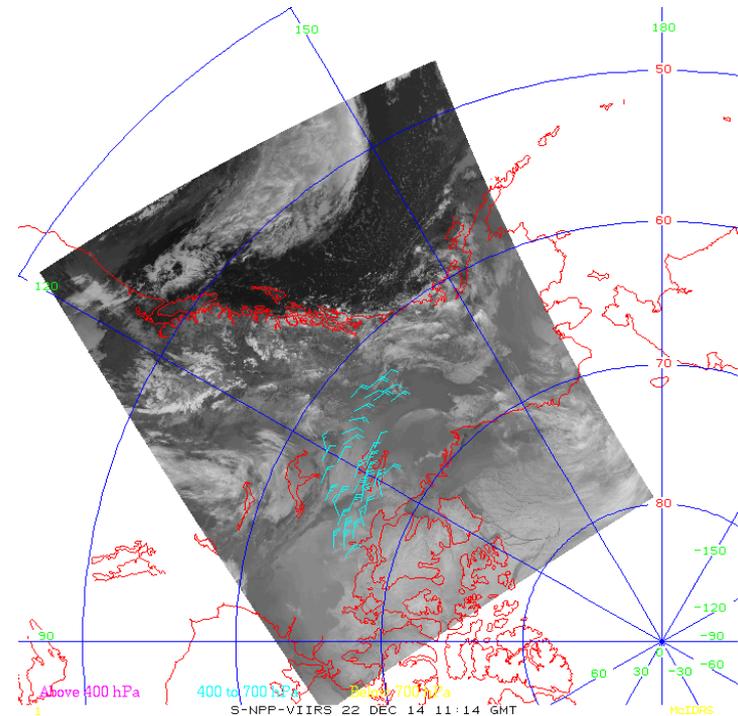


NDE Product Generation

Operational Science Applications



Green Vegetation Fraction (GVF)

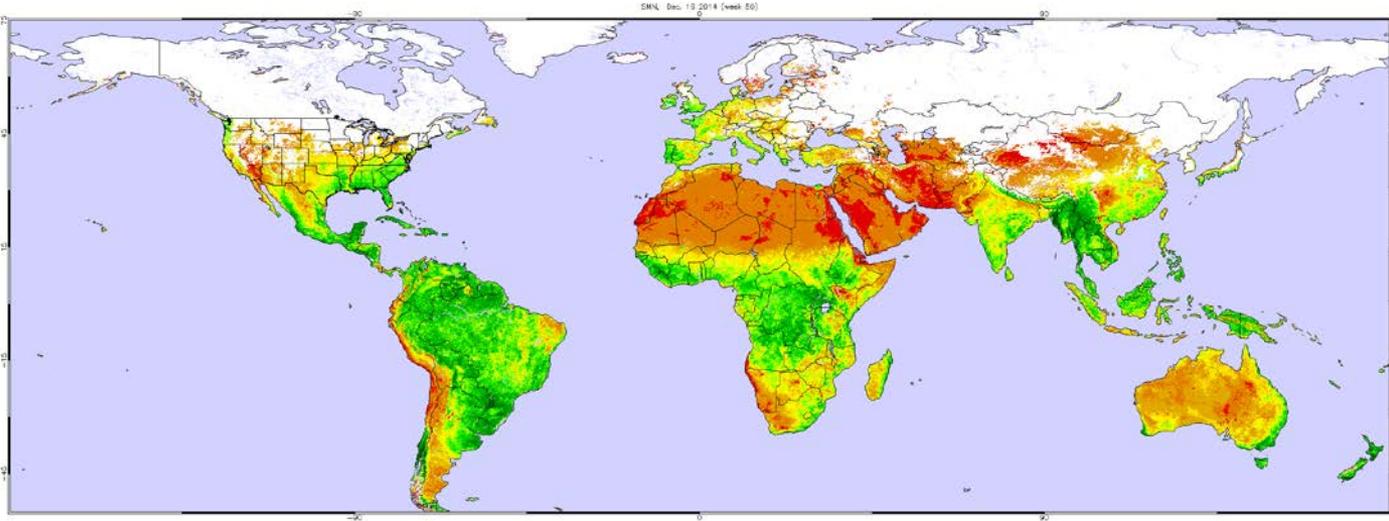


VIIRS Polar Winds (VPW)



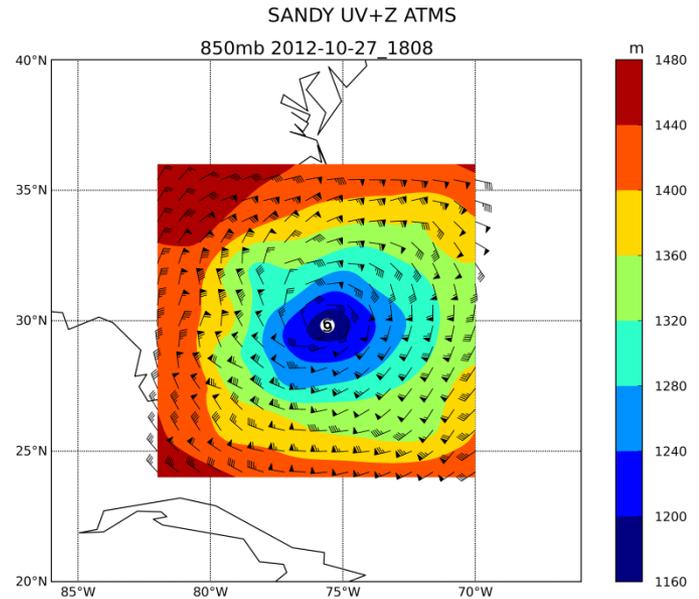
NDE Product Generation

Operational Science Applications



Vegetation Health (VH)

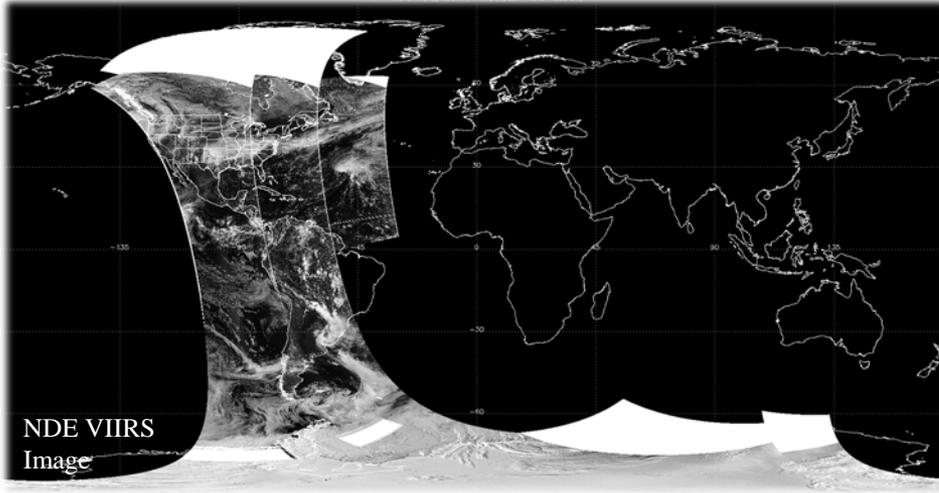
Tropical Cyclones (TC)



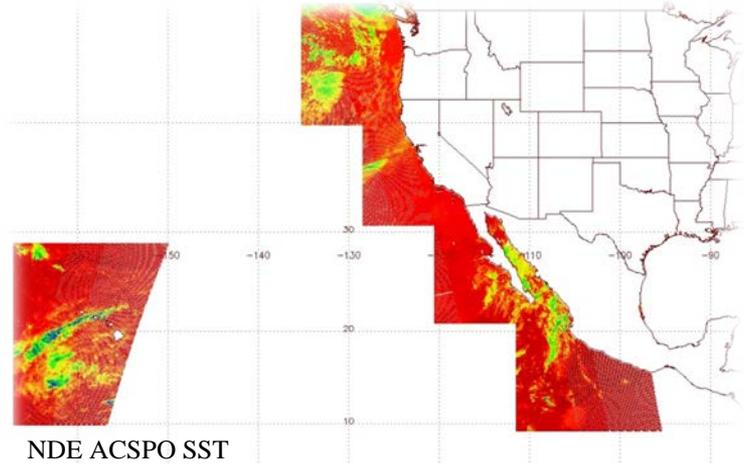
NDE Tailoring



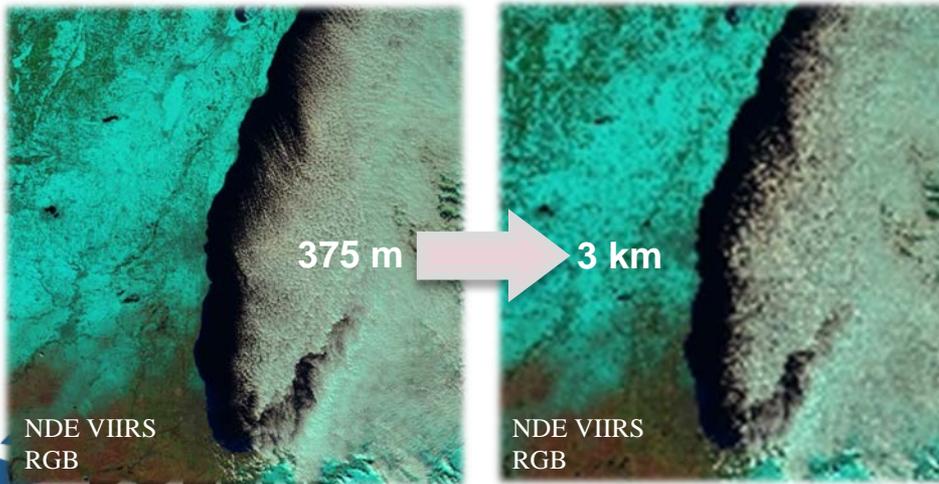
Aggregation



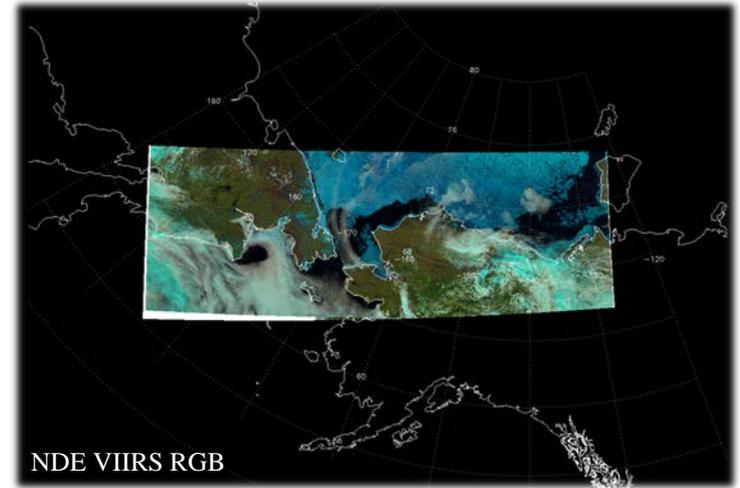
Filtering



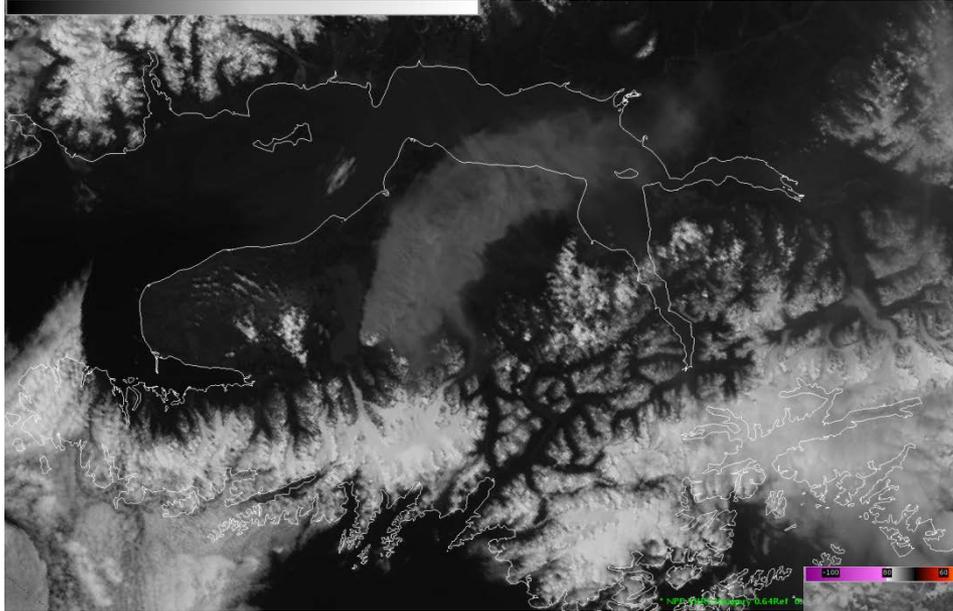
Resample



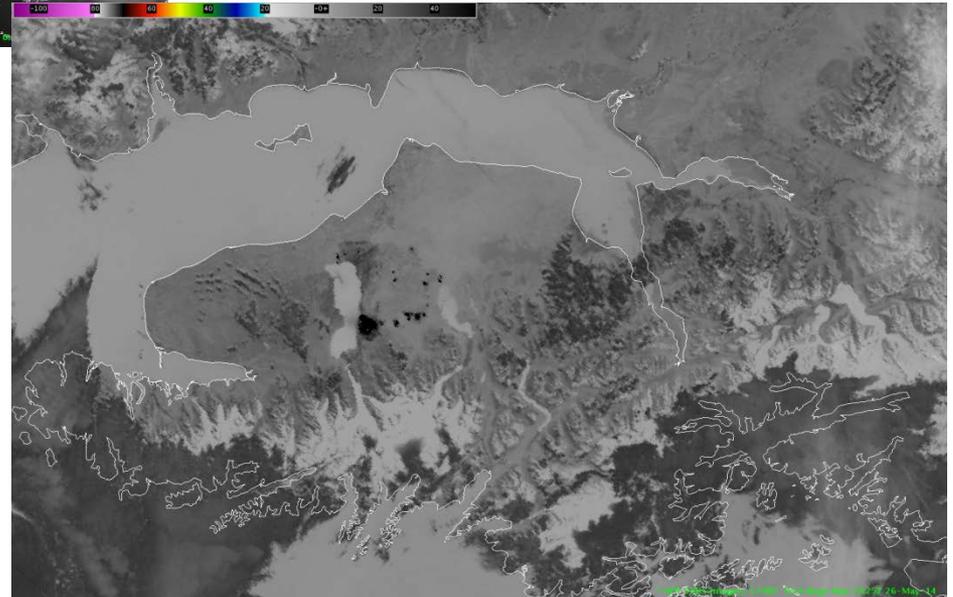
Remapping



NDE Tailoring – NWS AWIPS Alaska Region



Funny River Fire, Alaska
VIIRS I1 (Visible)



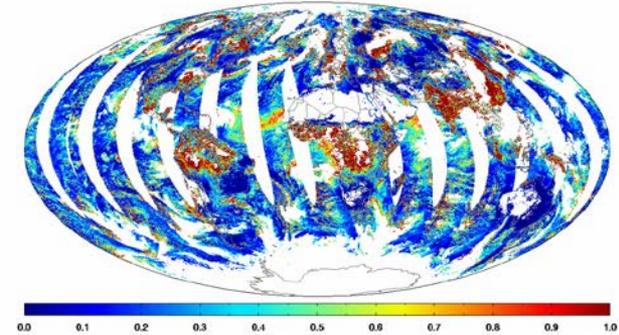
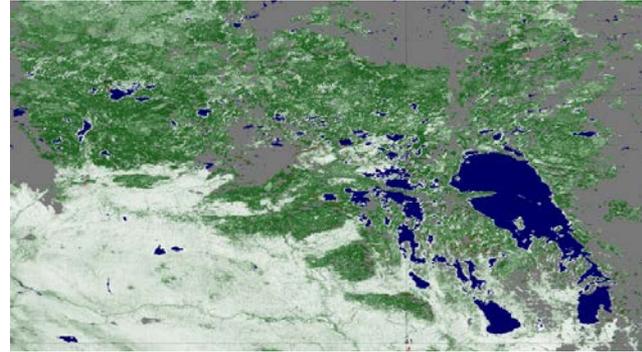
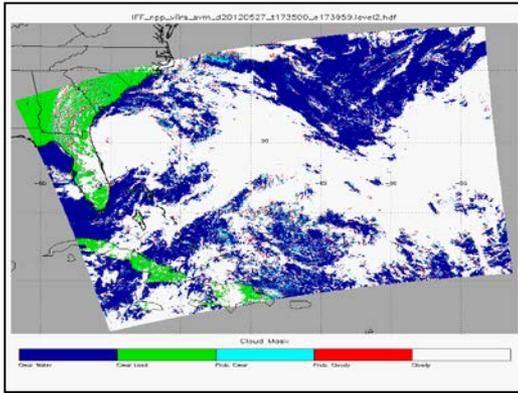
VIIRS I3 (Fire)

NDE 2.0 Product Generation

Operational Science Applications



JPSS Risk Reduction Products



GCOM AMSR2 Products

