



97th American Meteorological Society Annual Meeting

TRANSITIONING TO ENTERPRISE DATA PRODUCTS FOR THE JOINT POLAR SATELLITE SYSTEM

Arron L. Layns

JPSS Algorithm Management Project Lead &

Satellite Project Manager for JPSS

Lihang Zhou¹, Walter Wolf¹, Geof Goodrum², Bonnie Reed³

¹STAR, ²OSGS, ³JPSS

January 26, 2017



Outline



- **Satellite Product Management for JPSS**
- **Background on transition of EDRs**
- **Process for transition**
- **Timeline for transition**
- **User Considerations**
- **Items to be Worked**



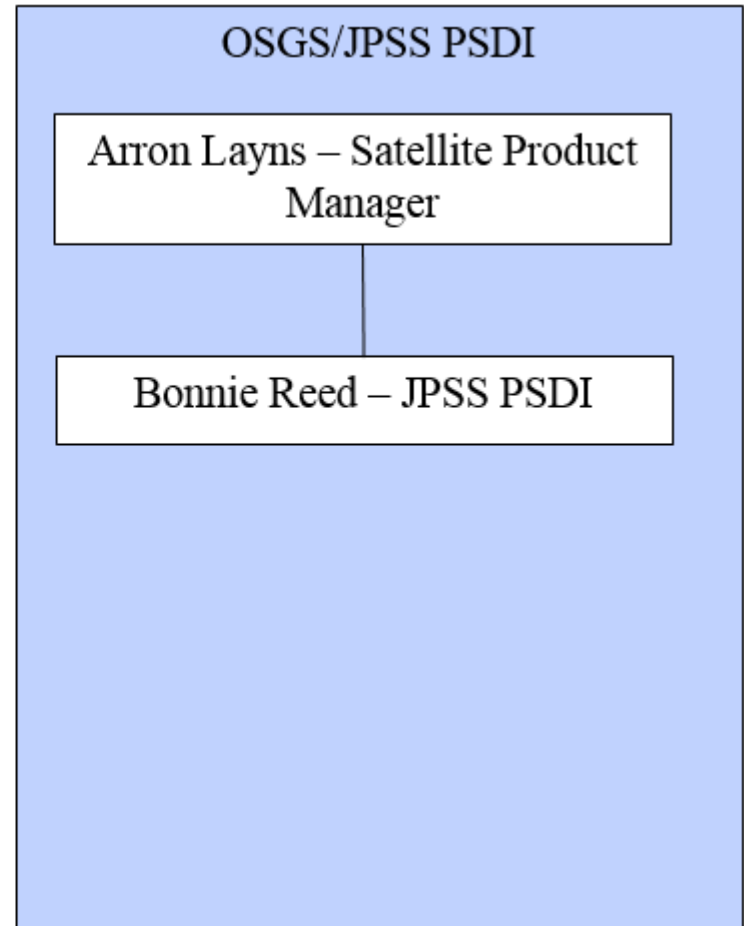
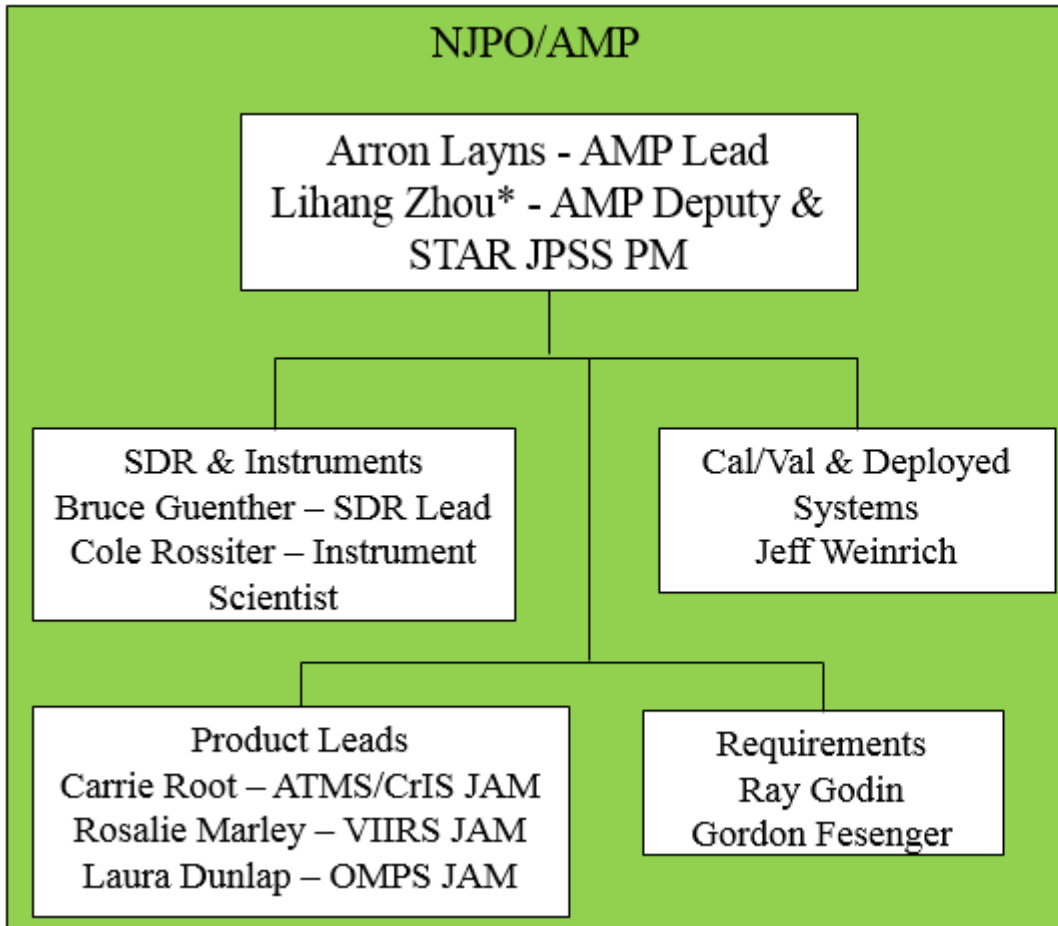
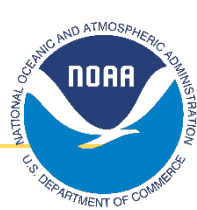
Satellite Product Management for JPSS



- JPSS, through the **Algorithm Management Project (AMP)**, is responsible for providing JPSS data products that meet user requirements.
- OSGS, through **Product System Development and Implementation (PSDI)**, is responsible for sustaining product algorithms based on user needs.
- **STAR** is responsible for providing high quality science and algorithms that meet the program requirements as well as provide calibration/validation, long-term science maintenance, product quality monitoring, and anomaly resolution for the life of the products.
- In the past, **AMP** has focused on those products implemented in the **IDPS** whereas **OSGS/PSDI** focused on those products implemented in **ESPC**.
 - NESDIS is moving towards consolidation of AMP and PSDI management for all data products regardless of processing system.



AMP & PSDI Organization (Current)





What is an Enterprise Algorithm?



Enterprise Algorithm: An algorithm that uses the same scientific methodology and software base to create the same classification of product from differing input data (satellite, in-situ or ancillary)

- **Advantages:**

- Continuity of NOAA products between current and future NOAA operational satellites
- Cost effective processing for NOAA products
- Maintenance of fewer algorithms and systems within operations
- Creates product and verification consistency
- Better meets NOAA Line Office user needs
- Eliminates the need to retrain users for continuity missions
- Streamlines transition to operations for new satellite missions
- One transition of the algorithm service to the GEARS system



Background on the Transition



- The JPSS Proving Ground/Risk Reduction funded the adaptation of GOES-R algorithms to the JPSS/VIIRS sensors.
 - Product performance was overall better than the performance of the IDPS algorithms and provided an opportunity to move towards Enterprise Algorithms.
- The JPSS Program reallocated product processing responsibilities from IDPS to NDE through approval of the following CCRs:
 - NJO-2013-12, Reallocation of CrIS/ATMS EDRs
 - NJO-2013-15, Reallocation of VIIRS SST EDR
 - NJO-2014-25, Reallocation of Active Fires
 - NJO-2015-18, Reallocation of all Priority 3 and 4 EDRs
- Full transition process is outlined on the next slide



Process for Transitioning to Enterprise Algorithms/Processing



Following the approval to reallocate processing to an enterprise processing system (e.g., NDE):

- 1. Flow down of Requirements:** The Configuration Managers of the applicable Level 2, 2.5, and 3 boards will confirm that CCRs have been generated in response to the Level 1 CCRs.
- 2. Project Planning and Execution:** Satellite Product and Services Review Board (SPSRB) project plans are developed and executed leading to an SPSRB recommendation for operational readiness.
- 3. Operationalization:** OSPO, with the applicable ground segment project, confirms reallocated product is operational, and users have been notified of the pending status of the terminated product.
- 4. User Notification and Transition:** OSPO and NCEI confirm reallocated product is archived appropriately, and users have been notified of the availability of the new product, and pending status of the terminated product.
- 5. Termination of Legacy Product:** After users have been given sufficient time to transition to the new products (estimated 2-4 months), the legacy products will be terminated.



S-NPP Data Products (EDRs Only)

Note: Does not include VIIRS Imagery EDRs because they will be processed in IDPS



Enterprise		
Aerosol Detection (VIIRS)	Global Surface Type (VIIRS)*	Rainfall Rate (ATMS)
Active Fires (VIIRS)	Green Vegetation Fraction (VIIRS)	Sea Ice Characterization (AMSR-2)
Aerosol Optical Depth(VIIRS)	Ice Age/Thickness (VIIRS)	Sea Surface Temperature (AMSR-2)
Aerosol Particle Size (VIIRS)	Ice Concentration (VIIRS)	Sea Surface Temperature (VIIRS)
Albedo (Surface) (VIIRS)	Ice Concentration (ATMS)	Sea Surface Wind Speed (AMSR-2)
AMSR Calibrated Sensor Data (AMSR-2)	Ice Surface Temperature (VIIRS)	Snow Cover/Depth (AMSR-2)
Atmospheric Vertical Moisture Profile (CrIS/ATMS)	Imagery (AMSR-2)	Snow Cover (ATMS)
Atmospheric Vertical Temperature Profile (CrIS/ATMS)	Imagery (ATMS)	Snow Cover (VIIRS)
Carbon Dioxide (CO) (CrIS)**	Infrared Ozone Profile (CrIS)	Snow Water Equivalent (ATMS)
Carbon Monoxide (CO2) (CrIS)**	Land Surface Emissivity (ATMS)	Snow Water Equivalent (AMSR-2)
Cloud Cover/Layers (VIIRS)	Land Surface Temperature (VIIRS)	Soil Moisture (AMSR-2)
Cloud Height (Top and Base) (VIIRS)	Land Surface Temperature (ATMS)	Surface Reflectance (VIIRS)
Cloud Liquid Water (AMSR-2)	Methane (CH4) (CrIS)**	Surface Type (AMSR-2)
Cloud Liquid Water (ATMS)	Moisture Profile (ATMS)	Temperature Profile (ATMS)
Cloud Mask (VIIRS)	Ocean Color/Chlorophyll (VIIRS)*	Total Precipitable Water (AMSR-2)
Cloud Optical Depth (VIIRS)	Outgoing Longwave Radiation (CrIS)	Total Precipitable Water (ATMS)
Cloud Particle Size Distribution (VIIRS)	Ozone Nadir Profile (OMPS-N)	Vegetation Indices (VIIRS)
Cloud Phase (VIIRS)	Ozone Total Column (OMPS-N)	Vegetation Health Index Suite (VIIRS)
Cloud Top Pressure (VIIRS)	Polar Winds (VIIRS)	Volcanic Ash Detection And Height (VIIRS)
Cloud Top Temperature (VIIRS)	Precipitation (Type/Rate)(AMSR-2)	

Already available in ESPC	Will be available when NDE 2.0 is operational	Will be available soon after NDE 2.0 is operational	Implementation in NDE planned in 2017
---------------------------	---	---	---------------------------------------

* Ocean Color will be generated in Okeanos and is expected to be operational in Feb/Mar 2017



S-NPP EDRs Transition to Operations Timeline



- **Cryosphere, Aerosol, and Cloud algorithms delivered to NDE.**
 - Operational Readiness Review (ORR) planned for February.
 - Products will be available operationally when NDE 2.0 becomes operational (expected February/March 2017)
- **Ozone products (Total Column and Nadir Profile) algorithms delivered to NDE.**
 - Expected to be made operational in the first NDE software release following NDE 2.0 ORR
- **Land Products**
 - Surface Reflectance
 - Algorithm Readiness Review (ARR) planned for February 2017
 - ORR planned for March 2017
 - Vegetation Indices
 - ARR planned for May 2017
 - ORR planned for July 2017
 - Surface Albedo & Land Surface Temperature
 - ARR planned for June 2017
 - ORR planned for August 2017

NOTE: Products are usually transitioned to operations approximately 1 month after ORR



Considerations for Users



- All JPSS products, as defined in the JPSS Level 1 Requirements Document (L1RD), will be calibrated/validated and will mature through the NESDIS data product maturity phases (e.g., beta, provisional, validated) with proper documentation.
- All JPSS products will be archived and freely, openly available to users.
 - Real-time, operational users can request access to the data products from OSPO via a Data Access Request (DAR)
 - Other users can access data products from CLASS
- Data Format differences: The IDPS products are generated in HDF5 format, though some are converted to other formats for NOAA users. NDE products are generated in netCDF4 format and comply with Climate and Forecast (CF) standards.
 - Other formats (BUFR, etc) are available for operational users.
- Product name changes: Consistent with the GOES-R product nomenclature, some JPSS data product names will be different when generated in NDE compared with IDPS.
 - For example, IDPS produced Sea Ice Characterization is now called Sea Ice Concentration, as produced by NDE.
 - A mapping of the IDPS product names to NDE product names is available.



Items to be Worked



1. Close-out remaining actions from the Priority 3/4 reallocation CCR so that Ozone and Land products can transition to operations
2. Efficiently transition all users of IDPS-generated EDRs to Enterprise products
3. Retire the IDPS-generated EDRs as quickly as possible to avoid ongoing maintenance costs
4. Proceed with long-term planning for the Enterprise Land products
5. Continue to refine/update products and requirements to meet user needs



Summary



- The transition to enterprise algorithms is making very good progress.
 - Cryosphere, Aerosol, and Cloud products will become operational when NDE 2.0 goes operational
 - Ozone EDR algorithms have been delivered to NDE and await operationalization
 - Land products have clear plans for DAP delivery and operationalization
- We need to start transitioning users of the IDPS-generated EDRs to the enterprise products now.
 - IDPS-generated EDRs will be terminated after the enterprise products are available and archived, and users are transitioned.
- AMP and PSDI responsibilities have combined, and all JPSS algorithms and products will follow Satellite Products and Services Review Board (SPSRB) processes and standards (including documentation) and will be evaluated using consistent maturity standards.



Questions?

Many thanks to STAR, OSPO, OSGS, and AMP colleagues!