

ISTRATION

ROLE OF STAR ALGORITHM INTEGRATION TEAM (AIT) IN INTEGRATING JPSS ALGORITHMS USING ALGORITHM DEVELOPMENT LIBRARY (ADL) FOR PRODUCT MATURITY

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> American Meteorological Society 94<sup>th</sup> Annual Meeting Atlanta, GA, USA February 2-6, 2014



## **Overview**



# **JPSS Instruments & Products**





**Cross-track Infrared** 

Sounder (CrIS)





Visible/Infrared Imager Radiometer Suite (VIIRS)



Ozone Mapping and Profiler Suite (OMPS)



### JPSS: Joint Polar Satellite Systems

- Suomi National Polar-orbiting Partnership (SNPP) Satellite
- JPSS -1
- JPSS -2
- TSI Calibration Transfer Experiment (TCTE)

### Products

- RDR (Raw Data Products)
- SDR (Sensor Data Products)
- EDR (Environmental Data Products)
- Note: More than 30 Products

**Production System: Interface Data Processing Segment (IDPS)** 

# **JPSS Algorithm Maturity Process**

**For EDR** 

Beta

### For SDR

- Beta
- Provisional
  Provisional
- Validated/Calibrated
  Validated

### **Three product validation stages**

- Stage 1 Validation: Small Independent Measurements
- Stage 2 Validation: Wide Range of Independent Measurements
- Stage 3 Validation: Compliant representing global conditions

### **ADL Framework**

- ADL is the Test System Developed by Raytheon
- ADL mimics IDPS system
- ADL provides a Diagnostic Framework
- ADL is recommended by Data Products Engineering (DPE)
- I-P-O Model (Input-Processing-Output)

## **Role of STAR AIT**





# **AIT Work Examples**

- □ Land surface albedo LUT updating
- Adjust Quality Flag for Thin Cirrus in Land Surface
  - Temperature (LST) and Update LUT
- Add Quality Check for ActiveFire
- Equation Modification for Sea Surface Temperature
  - and Evaluating Downstream Impact
- Roll Back LST LUT from Provisional to Beta Version
- New Rain Algorithm for CrIMSS
- Wavelength Shift for OMPS
- New Ozone Mixing Fraction for OMPS
- Implementing NOAA Global Multisensor Automated
  - Snow/Ice Map (GMASI) Tile

# **AIT Work Examples**

### Snow/Ice Rolling tiles in current and proposed systems



depends on DR7030

## **AIT Work Examples**

#### Example for updated run: VIIRS snow cover gridding ON and VIIRS sea ice gridding ON



#### Input Snow/Ice Rolling tile (Nov 15, 2012)







Input GMASI tile (Dec 16, 2012)

TrageMagick: snowlceCover\_gmasil179.gif

#### Tile 1179

### **AIT Work Example: Sensitivity Tests**



Change in classification with relatively small (realistic) perturbations in balance energy terms and ancillary data

### **AIT Work Example: Ozone IP**



Striping has been reduced with wavelength shift implementation: Image provided by OMPS Team

### **AIT Work Example: CrIMSS EDR**

### Temperature (K) at 850 hPa, February 5, 2013



#### Yield: QC(1)-Combined, QC(4)-MW in Combined, QC(5)-MW in MW Only

| Categories    | QC(1) | QC(4) | QC(5) | QC(1) & QC(4) |  | Categories    | QC(1) | QC(4) | QC(5) | QC(1) & QC(4) |
|---------------|-------|-------|-------|---------------|--|---------------|-------|-------|-------|---------------|
| All Profiles  | 54.15 | 28.71 | 81.70 | 19.16         |  | All Profiles  | 75.17 | 28.67 | 81.68 | 27.65         |
| Clear         | 55.60 | 18.52 | 77.55 | 11.37         |  | Clear         | 73.44 | 17.76 | 76.40 | 17.36         |
| Partly Cloudy | 51.13 | 37.57 | 84.97 | 25.12         |  | Partly Cloudy | 73.38 | 37.34 | 84.96 | 35.57         |
| Cloudy        | 58.40 | 30.41 | 83.27 | 22.59         |  | Cloudy        | 82.59 | 30.69 | 84.70 | 30.15         |
| Day           | 30.94 | 30.79 | 82.13 | 11.86         |  | Day           | 74.68 | 30.70 | 82.19 | 29.47         |
| Night         | 75.73 | 26.78 | 81.30 | 25.95         |  | Night         | 75.62 | 26.78 | 81.89 | 25.95         |

MX 6.4 Run

#### MX 6.6 Run

### **Summary**

### **Accuracy of Algorithms -> Product Accuracy**

- STAR AIT has a Significant Role in JPSS Algorithm Maturity
- **Process for:**
- Risk Reduction
- Science to Operations Task

### **STAR AIT**

- Facilitates Structured Tests
- Performs Emulation Experiments with Chain Run Tests
- Performs Code Updates, Tests and Delivery
- Facilitates Review Process

Future Improvements with ClearCase and ClearQuest

## **QUESTIONS?**

