**VIIRS SDR Release: Provisional Data Quality**

February 19, 2013

Recommended Cautions for Data Users

The JPSS Algorithm Engineering Review Board has released the VIIRS Sensor Data Record product to the public with a provisional quality data quality attribute. Provisional quality is defined in Table 1 below:

**Table 1. Provisional definition and associated Artifacts**

|  |  |
| --- | --- |
| Provisional definition | Artifacts (Deliverables) |
| Product quality may not be optimal | Product accuracy is determined for a broader (but still limited) set of conditions. No requirement to demonstrate compliance with specifications. |
| Incremental product improvements are still occurring | Narrative, listing and discussing known errors. All DRs are identified and prioritized (1-5). Provisional readiness will address priorities 1-2. Pathway towards algorithm improvements to meet specifications is demonstrated. |
| Version control is in affect | Description of the development environment, algorithm version (IDPS build number), and LUTs/PCTs versions used to generate the product validation materials. ATBDs are accurate, up-to-date and consistent with the product running. |
| General research community is encouraged to participate in the QA and validation of the product, but need to be aware that product validation and QA are ongoing | ADP STAR will request feedback from appropriate users for the product. The notification letter will include a Provisional Maturity disclaimer. DPA will send request to Project Science to post Provisional Maturity disclaimer on CLASS. DPA will submit readme document to CLASS. |
| Users are urged to consult the EDR product status document prior to use of the data in publications | Warning of potential non-reproducibility of results due to continuing calibration and code changes. Identify known deficiencies regarding product quality. |
| Ready for operational evaluation | Key NOAA and non-NOAA end users are identified and feedback requested. |

On October 23-24, 2012, NOAA’s Center for Satellite Applications and Research (STAR) organized a NPP Product Review (NPR) at the NOAA Center for Weather and Climate Prediction in College Park, Maryland. The NPR was attended by NPP/JPSS SDR Cal/Val Team members, Program and Project Scientists, Joint Center for Satellite Data Assimilation, and representatives from world leading Numerical Weather Prediction (NWP) Centers including NCEP and ECMWF. After a thorough review, the VIIRS SDR team reached consensus that the VIIRS SDR overall has reached provisional maturity status in all three areas: geospatial, spectral, and radiometric.

VIIRS geospatial (geolocation and geometric) and spectral performance have reached provisional status with no major issues. The geolocation error for the M bands is less than 80 meters in both scan and track direction. DNB geolocation achieves similar accuracy. One caveat is that while the impact of the responsivity degradation in the NIR channels on the spectral response is negligible at this point, it should be closely monitored as the degradation continues.

The VIIRS radiometric performance has also achieved provisional maturity status as of January 1, 2013 with the following caveats which need to be addressed for the validated maturity status:

* DNB stray light correction needs to be implemented in IDPS.
* M1 bias is a concern for the ocean color team and needs to be addressed.
* Continue longterm monitoring of instrument parameters and observed radiances, intercomparison with MODIS, and at desert site
* Resolve moon vs. solar calibration discrepancies
* Continue closely monitoring the instrument degradation
* Further characterize and potentially resolve the cold scene bias for M15
* Further characterize detector to detector performance and striping
* Further quantify the polarization effects and impact on products
* Further study the A side vs. B side calibration differences
* Investigate novel methods for M13 low gain calibration

In addition, efforts should be made to address the following issues by validated maturity status:

* Make an effort to implement terrain correction for the DNB
* Closely monitor geolocation anomalies

It should be noted that at low radiance, users who are concerned about the striping should keep track of which detector and HAM side used, and inform the VIIRS SDR team for diagnoses.

More information about VIIRS SDR can be found at the following VIIRS websites:

http://www.star.nesdis.noaa.gov/jpss/VIIRS.php, and https://cs.star.nesdis.noaa.gov/NCC/VIIRS,

where users can find the user’s guide, algorithm theoretical basis documents (ATBD), on-orbit instrument performance data, sample codes to read the VIIRS SDR data, conference presentations, and image gallery. In addition, the following journal publication contains information about the VIIRS performance:

 Cao, C., F. Deluccia, X. Xiong, R. Wolfe, and F. Weng, 2013, Early On-orbit Performance of the Visible Infrared Imaging Radiometer Suite (VIIRS) onboard the Suomi National Polar-orbiting Partnership (S-NPP) Satellite, IEEE Transaction on Geoscience and Remote Sensing, In press.