**VIIRS Suspended Matter EDR Release, Beta Data Quality**
**May 2013**
**Read-me for Data Users**

The JPSS Algorithm Engineering Review Board (AERB) released the Suspended Matter (SM) Environmental Data Record (EDR) to the public with a Beta level maturity as of May 2, 2012. Its short name is VIIRS-SusMat-EDR.

Beta quality is defined as:

- Early release product
- Initial calibration applied
- Minimally validated and may still contain significant errors (additional changes are expected)
- Available to allow users to gain familiarity with data formats and parameters
  Product is not appropriate as the basis for quantitative scientific publications, studies and applications

The Board recommends that users be informed of the following product information and characteristics when evaluating the SM EDR:

1. The suspended matter type for each pixel is derived for pixels (~750 m) with an AOT greater than a specified threshold. Possible suspended matter types are smoke, dust, sea salt, unknown, and none. Volcanic ash is detected by the VIIRS Cloud Mask (VCM) algorithm and passed on to the SM algorithm to be included in the output file.

2. There are some major issues with the quality of SM product both over land and over ocean:

   a. The VIIRS SM algorithm often classifies dust as smoke over water

   b. The VCM algorithm identifies dust and some clouds as volcanic ash

   c. The VIIRS SM algorithm detects a lot of smoke over land

3. The following are known issues with the VIIRS SM EDR:

   a. The probability of correct detection and typing of aerosols is small.  Only **best quality** data must be used.

   b. The VCM team tuned out most of the volcanic ash testing as of November 2, 2012 because of too many false positives.

   c. The aerosol models used to generate Look-Up-Table (LUT) for over ocean retrieval are different from those used for MODIS.  The Fine Mode Weight (FMW) is higher than MODIS.  SM algorithm types aerosols based on AOT threshold and FMW threshold.  These thresholds are inadequate to identify dust over ocean.

   d. The VIIRS SM algorithm uses land aerosol model identified in the AOT retrieval to type aerosols. Model other than dust (non-dust) is typed as smoke.


4. The next steps in the VIIRS SM validation process, to move the product to Provisional maturity, include the following:

a.  Additional testing with new LUT over ocean retrievals to see if there is any skill.

   a.  Complete testing of alternate algorithm based on deep blue and mid-IR channels for different scenarios; make it a stand-alone SM algorithm for operational implementation.

More information about VIIRS and VIIRS aerosol products can be found at the following websites, where users can find the Algorithm Theoretical Basis Document (ATBD), Operational Algorithm Description (OAD) document, Common Data Format Control Book (CDFCB), and product examples:

http://www.star.nesdis.noaa.gov/smcd/emb/aerosols/index.php
http://npp.gsfc.nasa.gov/science/documents.html

Additionally, the VIIRS Sensor Data Record (SDR) Beta quality Read-me document is available at:
http://www.class.ncdc.noaa.gov/notification/pdfs/120615_VIIRS_SDR_Release_v2.pdf

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