

***VIIRS Cloud Mask IP Release, Beta Data Quality***  
***Last Updated: 8/17/2012***  
***Read-me for Data Users***

The JPSS Algorithm Engineering Review Board approved the release of the VIIRS Cloud Mask (VCM) Intermediate Product (IP) to the public with a Beta level quality as of 2 May, 2012. 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 VIIRS Cloud Mask IP.

1. The early VCM validation effort centered on a 30-day spin-up period, where subject matter experts performed extraordinary analyses to tune the VCM for all known significant issues where tuning could be applied as a corrective measure. There were a total of 34 iterations of the VCM run during this period, with 74 thresholds updated by the time this work had finished. In this same time frame the first four Golden Granules were completed and over 1000 matchups with CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation) were made and evaluated. At the end of the 30-day spin-up, matchup results (not always statistically significant) indicated that the VCM was near MODIS performance in all evaluation categories, except leakage. This 30-day spin up serves as the initial calibration of the VCM.
2. External fields required by the VCM, notably snow and NDVI, are based on fixed fields from pre-launch exercises and are incorrect. The snow field is known to date back to 2002. These must be corrected before Provisional status can be achieved.
3. The VCM is, in specific situations, falsely identifying low ice clouds as snow cover. When this occurs the output is labeled confidently clear, when in reality it should be confidently cloudy. A fix for this problem over non-inland water has been approved by the AERB and was released as part of the Mx6.2 IDPS Release on August 9, 2012.
4. Leakage remains a main concern, especially from the Sea Surface Temperature (SST) community, which has reported poor results during the day; early results indicate that leakage is approximately twice that of the MODIS cloud mask. Collaboration with the SST team is ongoing.
5. Weaknesses in the performance near the edge of scan are being reported. Some confidently clear pixels over water, near the edge of the scan, are being labeled under one of the “probably” conditions. . There are also indications this can occur over deserts.
6. Aerosol identification is also not performing satisfactorily at large scan angles. Two software changes are under evaluation to address the “probably clear” situation, while the VCM Team has

begun collaboration with the Aerosol Team regarding dust and volcanic ash. Any identification of volcanic ash in the Beta version of the VCM should be ignored.

7. The VCM behavior at night, especially over land and snow, needs further tuning, as the 30-day spin-up expired before the thresholds were fully addressed. The VCM is showing strong sensitivity to certain thresholds, and careful analysis will be necessary to optimize these thresholds. This “trade space” needs to be better understood.
8. Radiometric accuracy and sufficient geolocation, covered by the VIIRS SDR team, are prerequisites for the VCM to attain Beta data quality. The VIIRS SDRs formally achieved Beta status in mid-May 2012. Please refer to the VIIRS SDR Read-me for Beta Data Quality for information regarding characteristics and caveats of the VIIRS SDR.
9. Additional Items to note:
  - a. Instrument and spacecraft maneuvers and tests: maneuvers and special tests are still being performed on-orbit to better characterize the VIIRS instrument performance. These include, but are not limited to, the monthly lunar maneuver, quarterly blackbody WarmUp CoolDown (WUCD) tests. During such events, the VCM IP will not be optimal, and may not be useable. Data users are encouraged to contact the VIIRS SDR team if any related issues arise. See VIIRS SDR Read-me for Beta Data Quality for POC.
  - b. The VIIRS VisNIR band degradation has had no negative impact on the VCM IP. See VIIRS SDR readme for details on this anomaly.
10. The next step in the VCM validation process is the move to Provisional status, which depends on the following factors: 1) advancement of VIIRS SDRs to Provisional, 2) corrections to the external snow and NDVI fields, 3) software changes to mitigate the identified problems above.

Additional information on VIIRS and the algorithm theoretical basis documents (ATBDs) are available at <http://www.star.nesdis.noaa.gov/jpss/ATBD.php>

The VIIRS SDR Read-me for Beta Data Quality is available at [http://www.class.ngdc.noaa.gov/notification/pdfs/120615\\_VIIRS\\_SDR\\_Release\\_v2.pdf](http://www.class.ngdc.noaa.gov/notification/pdfs/120615_VIIRS_SDR_Release_v2.pdf)

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