

VIIRS ARP Release, Beta Data Quality
Last Updated: 10/22/2012
Read-me for Data Users

The Joint Polar Satellite System (JPSS) Algorithm Engineering Review Board approved the release of the Visible Infrared Imager Radiometer Suite (VIIRS) Active Fires Application Related Product (ARP) to the public with a Beta level quality as of 03 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 Active Fires ARP.

1. Product status: The VIIRS Active Fires ARP is based upon the MODIS (Moderate Resolution Imaging Spectroradiometer) Thermal Anomalies and Fire product Version 4 code, adapted for use with the VIIRS data. The VIIRS Active Fires ARP provides the latitude and longitude of pixels in which the algorithm detected hot targets, which are predominantly fires burning at the time of the observation. The current product was designed to meet heritage requirements of the National Polar Orbiting Environmental Satellite System (NPOESS), and the Beta evaluation was performed against those heritage requirements. A spatially explicit fire mask and fire radiative power retrieval are additional requirements of the Joint Polar Satellite System (JPSS) and are expected to be implemented in the future. Further algorithm changes to improve detection performance also include the incorporation of new MODIS Collection 6 algorithm components, and the tuning of the algorithm to VIIRS sensor characteristics.
2. Product evaluation: Quantitative evaluation to date is based on correlative analysis with the Aqua MODIS Thermal Anomalies and Fire product (MYD14). Though the VIIRS processing algorithm is an earlier version of the current MODIS algorithm, the differences do allow for product inter-comparison for Beta evaluation. Starting with IDPS Build Mx5.3, which included a correction for the aggregation of native resolution VIIRS observations into moderate resolution VIIRS M13 pixel radiances, the observed differences between VIIRS and MODIS fire counts are consistent with those expected from the differences in spatial sampling. The JPSS VIIRS Active Fires Algorithm and Validation Team therefore considers the start date of product Beta quality the first full calendar date following the implementation of IDPS Build Mx5.3.

3. Known errors: Main anomalies identified in the initial data product included corrupted M13 brightness temperature values (>450 K) and corresponding spurious fire detections along single scans; alternating omission of fire pixels between successive scans; and spurious fire pixels coinciding with the terminator. Spurious fire detections appeared when a) incorrectly calibrated M13 pixels were not flagged in the VIIRS SDR product, and b) M13 pixels with poor calibration or no calibration data were flagged in the VIIRS SDR product, but were still processed by the Active Fire ARP code. The anomalies were mostly related to an anomalous pattern of on-board calibration sector sequence for dual-band gain states, including VIIRS band M13 (see the VIIRS SDR Read-me file, item #6). A correction for the dual-gain switching sequence anomaly in VIIRS SDR was implemented on October 15, 2012 at NOAA NESDIS as part of the IDPS Mx6.3 build.

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

The VIIRS SDR Read-me for Beta Data Quality is also available at the CLASS Homepage.

Point of Contact

Ivan Csiszar
VIIRS Active Fires ARP Algorithm and Validation Lead
Email: ivan.csiszar@noaa.gov
Phone: 301-683-3583