

GOES-16 ABI Fire Detection and Characterization (FDC) Release, Beta Data Quality
May 24, 2017
Read-Me for Data Users

The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for ABI L2 Fire Detection and Characterization (FDC) Beta Maturity was held on May 24, 2017. As a result of this review, the PS-PVR panel recommended that the ABI Fires product be declared Beta on that day.

The ABI L2 Fires product includes four fields: fire radiative power (FRP), instantaneous fire temperature, instantaneous fire size, and a metadata mask that contains fire categories and information about the non-fire pixels. All four provide coverage over the Full Disk (FD) of the Earth and the Continental United States (CONUS) region.

Full description and format of the FDC product is in the Product Definition and User's Guide (PUG) document (<http://www.goes-r.gov/products/docs/PUG-L2+-vol5.pdf>). The algorithm used to derive FDC from GOES-16 ABI observations is described in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Fire/Hot Spot Characterization" (<http://www.goes-r.gov/products/ATBDs/baseline/baseline-fire-hot-spot-v2.0.pdf>).

Beta maturity, by definition, means that:

- Rapid changes in product input tables / algorithms can be expected;
- Product quick looks and initial comparisons with ground truth data were not adequate to determine product quality;
- Anomalies may be found in the product and the resolution strategy may not exist;
- Product is made available to users to gain familiarity with data formats and parameters;
- Product has been minimally validated and may still contain significant errors; and
- Product is not optimized for operational use.

Beta users bear all responsibility for inspecting the data prior to use and for the manner in which the data are utilized. Persons desiring to use the GOES-16 ABI Beta maturity Fires products for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA algorithm working group (AWG) scientist for feasibility of the planned applications. These products are sensitive to upstream processing, specifically the quality of the calibration and navigation. NOAA requests that any organizations that redistribute GOES-16 data -- before it is declared operational -- include the following disclaimer with the data: "NOAA's GOES-16 satellite has not been declared operational and its data are preliminary and undergoing testing."

Known issues being resolved include:

1. Missing values occur over large boxed areas, often in but not limited to South America;
2. False alarms due to ground heating – these will be resolved once sufficient data to determine proper thresholds is in hand;
3. False alarms due to solar reflection – thresholds also need to be adjusted and additional tests may be necessary;

4. Current TPW attenuation look-up table needs to be updated using flight instrument spectral responses (impacts accuracy of fire characteristics);
5. Validation of fire characteristics has yet to begin, it occurs during the beta maturity stage;
6. Fire temperature field incorrectly fills all non-fire values as 600 K as well as fires less than 600 K, and fires are capped at 1200 K – be mindful of the range parameters provided in the L2 files as they will change during the Beta phase;
7. FRP range is truncated similarly to fire temperature (75 MW to 50,000 MW) and will also be corrected;
8. Fire size is set to a minimum of 0.004 km² for non-fire pixels, it should be missing value (the maximum of 4 km² is correct);
9. Various cloud-related mask values are set incorrectly (though properly set as cloud) – this does not impact the detected fires in any way.