GOES-16 ABI Level 2 Land Surface Temperature (LST), Beta Data Quality
June 18, 2017
Read-Me for Data Users

The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for ABI L2 Land Surface Temperature (LST) Beta Maturity was held on May 24, 2017. As a result of this review, the PS-PVR panel recommended that the ABI LST data be declared Beta.

The ABI Level 2 LST product provides coverage over the Full Disk (FD) of the Earth, the Continental United States (CONUS) region, and both Mesoscale (MESO) regions. The file includes the LST scaled to unsigned integer, the corresponding data quality flags (DQF), and a series of product metadata. They also include the product quality indicator (PQI) in the intermediate product (IP) files.

Full description and format of the LST 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 LST from GOES-16 ABI observations is described in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Land Surface Temperature" (http://www.goes-r.gov/products/ATBDs/baseline/baseline-LST-v2.0.pdf).

Beta maturity, by definition, means that:

- Initial calibration applied (L1b);
- 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 CTP for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA ABI algorithm working group (AWG) scientists for feasibility of the planned applications. The product is sensitive to upstream processing, such as the quality of the L1b product calibration, sensor navigation/registration, cloud mask, total precipitable water and emissivity at the two split-window bands.

Known issues being resolved include:

1. Significant underestimate by satellite LST has been found at certain regions.
2. Missing values occur frequently and randomly over boxed areas.
3. Inconsistency among LST, DQF, and PQI occurs randomly for some pixels.
4. Product and DQF metadata calculation error occurs randomly.
5. Emissivity used in operational retrieval is from historical Seebor emissivity product, which might degrade the LST retrieval.
6. Sensor navigation/registration issue has not been fully resolved, which potentially degrades the

LST retrieval.

7. FD LST resolution of 10 km is significantly larger than the in-situ stations' footprint (~ a few tens meters).