GOES-16 ABI L2+ Land Surface Temperature (LST)
Full Data Quality
April 30, 2024
Read-Me for Data Users

GOES-R Advanced Baseline Imager (ABI) L2+ products will achieve Full Validation maturity by default after two years of Provisional and Operational use with no major anomalies reported (minor product improvements may still be occurring). As a result, GOES-16 Land Surface Temperature (LST) is considered Full Validation maturity as of March 19, 2020.

The GOES-R ABI LST product is generated from ABI bands 14 (11.2 um) and 15 (12.3 um) with the split-window technique. The retrieval is available for each land/inland water pixel under clear, probably clear, or probably cloudy cloud conditions. The LST product is currently being generated once an hour for every ABI Full Disk (FD) of the Earth, the Continental United States (CONUS) region, and the Mesoscale (MESO) regions. No MESO LST will be available under Scan Mode 4. The GOES-R satellite offers LST data with varying resolutions: 2 km for CONUS and MESO, and both 2 km and 10 km for FD data. A significant algorithm upgrade was implemented and became operational in the GOES-R ground system on August 19, 2021, which led to the creation of the 2 km FD LST product as an additional product.

A full description and format of the LST product can be found in the Product Definition and User's Guide (PUG) Volume 5: Level 2+ Products, located on OSPO's GOES-R documents webpage: https://www.ospo.noaa.gov/Organization/Documents/goes-r.html. The algorithm used to derive the LST product from GOES-16 ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Land Surface Temperature", located on STAR's GOES-R ATBD webpage: https://www.star.nesdis.noaa.gov/goesr/documentation_ATBDs.php.

Full maturity, by definition, means that:
- Validation, quality assurance, and anomaly resolution activities are ongoing.
- Incremental product improvements may still be occurring.
- Users are engaged and user feedback is assessed.
- Product performance for all products is defined and documented over a wide range of representative conditions via ongoing ground-truth and validation efforts.
- Products are operationally optimized, as necessary, considering mission parameters of cost, schedule, and technical competence as compared to user expectations.
- All known product anomalies are documented and shared with the user community.
- Product is operational.

Persons desiring to use the GOES-16 ABI Full maturity LST products for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA/NESDIS/STAR Algorithm Working Group (AWG) scientists for feasibility of the planned applications. The LST product is sensitive to upstream processing that includes the quality of the calibration, navigation, cloud mask, and total precipitable water.

Status of the LST product and any remaining known issues that are being resolved:
1. Summary of the measured performance of the LST product as measured against reference data:
    - Accuracy specifications for FD, CONUS, and MESO LST products are met in general

based on validation results with respect to in-situ observations. Algorithm performance may vary over difference regions.

- Precision specifications are met for all four LST products. Algorithm performance may vary over different regions.

2. ABI LST in general has good agreement with those from other sensors, including SNPP-VIIRS, AQUA-MODIS, and TERRA-MODIS.

Contact for further information: OSPO User Services at SPSD.UserServices@noaa.gov

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