GOES-18 ABI Land Surface Temperature (LST)
Provisional Data Quality
November 9, 2022
Read-Me for Data Users

The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for the GOES-18 Advanced Baseline Imager (ABI) L2+ Land Surface Temperature (LST) Provisional Maturity was held on November 9, 2022. As a result of this review, the panel chair declared that this product meets the criteria for Provisional Maturity.

The ABI Level 2 LST product provides coverage over the Full Disk (2KMFD and FD) of the Earth, the Continental United States (CONUS) region, and two Mesoscale (MESO) regions. The file includes the LST scaled to unsigned integer, the corresponding data quality flags (DQF) and product quality indicator (PQI), and a series of product metadata. The product is produced with an hourly cadence.

A full description and format of the LST can be found 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 the LST from GOES-R ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Land Surface Temperature" (https://www.star.nesdis.noaa.gov/goesr/rework/documents/ATBDs/Enterprise/GOES-R_ABI_ATBD_Land_LST_v4_clean_Jun2020.pdf)

By definition, Provisional maturity means that:

- Validation and quality assurance activities are ongoing and the general research community is now encouraged to participate;
- Severe algorithm anomalies are identified and under analysis. Solutions to anomalies are in development and testing;
- Incremental product improvements may still be occurring
- Product performance has been demonstrated through analysis of a small number of independent measurements obtained from selected locations, periods, and associated ground-truth/field program efforts;
- Product analysis is sufficient to communicate product performance to users relative to expectations;
- Documentation of product performance exists that includes recommended remediation strategies for all anomalies and weaknesses. Any algorithm changes associated with severe anomalies have been documented, implemented, tested, and shared with the user community;
- Testing has been fully documented; and
- Product is ready for operational use and for use in comprehensive calibration/validation activities and product optimization.

Provisional 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-18 ABI Provisional-maturity LST product for any

reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA Algorithm Working Group (AWG) 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 at this stage include:

1. Emissivity used in operational retrieval is from historical Seebor emissivity product, which may not adequately reflect the real-time land surface change.

Note that all issues of products that are upstream of LST, including the ABI Level 1b product, clear sky mask, and total precipitable water, apply to LST.

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

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