

GOES-19 ABI Level 2 Land Surface Temperature (LST)

Provisional Data Quality

February 12, 2025

Read-Me for Data Users

The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for the GOES-19 Advance Baseline Imager (ABI) L2+ Land Surface Temperature (LST) Provisional Maturity was held on February 12, 2025. As a result of this review, the PS-PVR panel recommended that the ABI Land Surface Temperature product be declared Provisional.

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.

A full description and format of the LST can be found in the Product Definition and User's Guide (PUG) Volume 5 (<https://www.ospo.noaa.gov/resources/documents/goes-r.html>). 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". ATBDs are available at: https://www.star.nesdis.noaa.gov/goesr/documentation_ATBDs.php.

Provisional maturity, by definition, 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-19 ABI Provisional-maturity LST product for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the

NOAA 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. Any issues impacting these upstream products may impact LST as well. The LST current hourly production cadence may limit applications requiring higher temporal resolution.

Remaining known issues impacting LST:

1. None

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

Contacts for specific information on the ABI L2 LST product:

Yunyue Yu yunyue.yu@noaa.gov

Peng Yu peng.yu@noaa.gov