GOES-19 ABI L2+ Clear Sky Mask (CSM) Release
Beta Data Quality
October 1, 2024
Read-Me for Data Users

The GOES-19 Advanced Baseline Imager (ABI) L2+ Clear Sky Mask product was declared Beta maturity on October 1, 2024. No formal review was conducted because the algorithm is identical to GOES-16/17/18. Beta declaration of the ABI L1b and CMI therefore applies to the ABI L2+ products.

The ABI Clear Sky Mask products provide a binary cloud presence decision over the Full Disk (FD) of the Earth, the Continental United States (CONUS) region, and the Mesoscale (MESO) regions. In addition, there are three other variables within the file:

- 4-Level Mask - The Clear Sky Mask (CSM) combines spectral and spatial tests to produce a 4-level classification of cloudiness at each pixel location. The 4 levels are:
    - 0 = Clear
    - 1 = Probably Clear
    - 2 = Probably Cloudy
    - 3 = Cloudy
- Cloud Probability - Likelihood of a cloud at a given pixel location (range: 0.0 - 1.0)
- Data Quality Flag
    - 0 - Good quality cloud mask
    - 1 - Bad quality
    - 2 - Invalid pixel due to space view
    - 3 - Not used
    - 4 - Not used
    - 5 - Not used
    - 6 - Degraded due to out-of-range focal plane temperature (FPT) or missing channel

A full description and format of the CSM 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 Enterprise version of Cloud Mask from GOES-R ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for A Naïve Bayesian Cloud Mask Delivered to NOAA Enterprise". ATBDs are available at https://www.star.nesdis.noaa.gov/goesr/documentation_ATBDs.php.

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 are responsible for inspecting the data prior to use and for the manner in which the data are utilized. Anyone desiring to use the GOES-19 ABI Beta-maturity Clear Sky Mask products for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA Algorithm Working Group scientists for feasibility of the planned applications.

The Cloud team identified an issue with the Planck coefficients for GOES-19 used by the fast Planck routine within the GOES-R Ground System (GS) which will affect the solar radiative transfer model (RTM) calculation within the CSM as well as any classifiers that use the RTM for GOES-19. The updated Planck coefficients will be installed to the GS prior to the Provisional evaluation. This issue was resolved on 23 October 2024 when updated Planck coefficients were installed in the GS. In addition, the CSM lookup table will be updated after Provisional status.

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

Contacts for specific information on the ABI L2+ CSM product:
Jaime Daniels jaime.daniels@noaa.gov
Mark Kulie mark.kulie@noaa.gov