GOES-16 and GOES-18 ABI L2+ Cloud Cover Layers (CCL)
Provisional Data Quality
May 16, 2023
Read-Me for Data Users

The Peer/Stakeholder Product Validation Review (PS-PVR) for the GOES-16 and GOES-18 Advanced Baseline Imager (ABI) L2+ Cloud Cover Layers (CCL) was held on May 16, 2023. The outcome of the review was that ABI CCL was approved at the Provisional Maturity level.

The ABI L2+ Cloud Cover Layers product is a derived cloud fraction at a predefined spatial resolution and between specified cloud layers. It also retrieves the total cloud fraction from surface to top of the atmosphere at the same resolution. It mainly utilizes cloud mask, cloud top and base products from upstream cloud mask, height and base algorithms to derive CCL information. CCL products include 6 cloud fractions: total fraction and 5 cloud layer fractions at predefined flight levels. The 5 layers are SFC-FL050, FL050-FL100, FL100-FL180, FL180-FL240, and FL240-TOA, where flight levels are in thousands of ft, e.g. FL050 is FL at 5,000 ft, SFC=surface, and TOA=top of atmosphere. The horizontal resolutions for those fractions are 10 km for Full Disk (FD) and CONUS, and 4 km for mesoscale (2 km native resolution products should be available in the future). The CCL products are generated for every FD, CONUS, and Meso sector.

The algorithm used to derive the Cloud Cover Layers product from ABI observations is described in detail in the Algorithm Theoretical Basis Documents (ATBD): “AWG Cloud Cover Layer Algorithm”. 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 select locations, periods, and associated ground truth or field campaign efforts.
- Product analysis is sufficient to communicate product performance to users relative to expectations (Performance Baseline).
- 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.
- Product is ready for operational use and for use in comprehensive calibration/validation activities and product optimization.

Persons desiring to use the GOES-16 and GOES-18 ABI Provisional Validation Maturity CCL 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.

Known issues at the Provisional Maturity Validation stage include:

1. A horizontal striping artifact in the Southern Hemisphere exists in the CCL product created in the Ground System Development Environment (DE). Since this artifact does not exist in any upstream input cloud products, nor in CCL products created locally at NOAA Cooperative Institutes or using the Satellite Algorithm Processing Framework, this issue is likely related to ancillary data used to create the CCL product in the operational processing system. An Algorithm Discrepancy Report has been created to rectify this issue.
2. Missing blocks of data were noted in some operational products created in the DE. This is a result of NWP processing in the DE timing out for a given segment of data. This does not exist in the Operational Environment.

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