GOES-16 and GOES-17 ABI L2+ Fractional Snow Cover
Beta & Provisional Data Quality
September 30, 2021
Read-Me for Data Users

The Peer/Stakeholder Product Validation Review (PS-PVR) for the GOES-16 and GOES-17 Advanced Baseline Imager (ABI) L2+ Fractional Snow Cover (FSC) was held on September 30, 2021. The outcome of the review was that ABI FSC was ***not approved*** at the Provisional Maturity level, nor the Beta maturity level. This means ABI Snow Cover data remain restricted and unavailable for public access.

Rationale for this decision include:

1. The Baseline FSC algorithm is also known as GOESRSCAG, and the algorithm basis comes from an old MODIS algorithm known as MODSCAG. The FSC team who did the validation analysis and presented the review didn't have access to all the source code of GOESRSCAG, limiting their ability to do a deep dive analysis into some issues.
2. The validation included examples from late winter/spring 2021, and in nearly every case, the output did not look reasonable. Specifically, most of the pixels in a region that should be completely snow covered (100%, per validation data and VIIRS) had values in the 60-80% range. This error is a fundamental deficiency in the algorithm.
3. In terms of the requirements, technically the validation met the 30% accuracy requirement but failed the 15% precision requirement. However, it is questionable whether these requirement values are appropriate and valid. The recommendation is to update them to be in line with those for VIIRS (0.20 for precision and no accuracy requirement). This also aligns with most WMO Application Areas. GOES-R Program System Engineering is working this.
4. Preliminary results from the Enterprise version of the algorithm showed much more reasonable results and well within spec. This code has already been delivered to the NESDIS/STAR/ASSISTT integration team.
5. There are no current user requests for this data.

Beta maturity, by definition, means that:

- Rapid changes in product input tables / algorithms can be expected;
- Product quick looks and initial comparisons with ground truth data 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.

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 cal/val activities and product optimization.

As of the date on this document, the promotion of the ABI Enterprise Snow Cover algorithm to operations is anticipated FY23Q1. Please use the contacts below for more up to date information.

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

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