

GOES-18 ABI L2+ Legacy Ice Thickness and Age (AITAF) Release
Provisional Data Quality
December 29, 2022
Read-Me for Data Users

The Peer/Stakeholder Product Validation Review (PS-PVR) for the GOES-18 Advanced Baseline Imager (ABI) L2+ Legacy Ice Thickness and Age (AITAF) products was held on December 29, 2022. The PS-PVR chair recommended that the Legacy Ice Thickness and Age (AITAF) product be declared Provisional Maturity.

The ice thickness and age products are generated for ABI Full Disk (FD) every three hours. The ice thickness and age (ITA) algorithm uses a one-dimensional thermodynamic ice model (OTIM) which is based on the surface energy balance at thermo-equilibrium and contains all components of the surface energy budget to estimate sea, river, and lake ice thickness up to five meters. The algorithm relies on retrieved products from ABI such as cloud mask and ice surface temperature, and the parameterizations of some input variables if they are not otherwise available such as snow depth. A retrieval is available for each clear-sky and ice-covered pixel.

The ice thickness and age products include ice thickness output as well as a 3-category ice age estimation – ice free, first-year ice, and older ice – for ice-covered pixels. It should be noted that ice thickness is not a required output, and the product also contains a more extensive set of ice age categories: ice free, new ice, grey ice, grey-white ice, thin first-year ice, medium first-year ice, thick first-year ice, and older ice.

A full description and format of the ITA products 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 ice age and thickness product from GOES-18 ABI observations is described in detail in the "Algorithm Theoretical Basis Document For ABI and VIIRS Ice Thickness and Age" (https://www.star.nesdis.noaa.gov/goesr/documents/ATBDs/Baseline/ATBD_GOESR_IceThickness_2.2_Jan2019.pdf).

GOES-18 ABI thickness and age products were compared quantitatively with the GOES-16 and VIIRS (Visible Infrared Imaging Radiometer Suite) products, and qualitatively with US National Ice Center (NIC) ice charts as well. The results are reasonably consistent with those validation data products, with differences much smaller than product requirements.

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.

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 ITA 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. Any calibration, registration, and missing data issues in the up-stream product precedence chain can affect the ITA products.

There are no specific known issues at this time.

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

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