

GOES-19 ABI L2+ Legacy Ice Thickness and Age (AITAF) Release
Beta Data Quality
October 1, 2024
Read-Me for Data Users

The GOES-19 Advanced Baseline Imager (ABI) L2+ Legacy Ice Thickness and Age (AITAF) products were declared Beta maturity on October 1, 2024. No formal review was conducted because the algorithms are identical to the ones running with GOES-16 and GOES-18, so the Beta declaration of the ABI L1b and CMI flows down to the ABI L2+ products.

The ice thickness and age products are generated for ABI Full Disk (FD) of the Earth, and the Continental United States (CONUS) region, 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. The retrieval is available for each clear and ice-covered pixel. An estimate of the ice age is then based on the retrieval of ice thickness. The sea, river, and lake ice thickness and age products will help climate forecasters monitor short- and long-term changes in sea, river, and lake ice.

A full description and format of the ITA products 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 Enterprise algorithm used to derive the ice age and thickness product from GOES-19 ABI observations is described in detail in the "Algorithm Theoretical Basis Document for Ice Thickness and Age from VIIRS, ABI, and METImage", available at https://www.star.nesdis.noaa.gov/goesr/documentation_ATBDs.php.

GOES-19 ABI thickness and age products were compared to the GOES-16 and GOES-18 products in the overlap regions. The results are reasonably consistent with GOES-16 and GOES-18, with differences much smaller than product requirements as estimated by visual comparisons. While not a requirement, the product includes thickness. The required ice age categories – ice free, first-year ice, and older ice – are based on thickness. The product also contains a more extensive set of ice age categories: new, grey, grey white, first-year thin, first-year medium, first-year thick, and older ice.

Beta maturity, by definition, means that:

- Initial calibration applied in L1b product;
- 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 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 Beta-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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