GOES-19 ABI L2+ Aerosol Detection Product (ADP) Release
Beta Data Quality
October 1, 2024
Read-Me for Data Users

The GOES-19 Advanced Baseline Imager (ABI) L2+ Aerosol Detection Product (ADP) was declared Beta maturity on October 1, 2024. The Beta certification of the ABI L1b and Cloud and Moisture Imagery (CMI) flows down to the ABI L2+ products because the same ADP algorithm is running with GOES-16 and GOES-18 data.

ABI L2+ ADP includes flags describing the presence of aerosol (including smoke/dust) in the atmosphere over land and over ocean, associated quality flags to indicate the confidence level (low, medium and high) of the detected smoke/dust, a flag to indicate within/out of the sun-glint region, and flags to indicate within/out of the valid solar/view zenith angle ranges. All flags are reported as binary 1/0 (yes/no). ADP is produced during the daytime over clear-sky and snow-free regions, over both land and water, when the satellite view zenith angle is less than 90° and the solar zenith angle less than 87.5°.

ADP is produced on the ABI fixed grid, with a resolution ranging from 2 km at nadir to ~20 km at the edge of ABI's Earth view. Low solar and satellite elevation (i.e., solar zenith angle larger than 60°, view zenith angle larger than 70°) reduces the spatial coverage of ADP at the high and medium confidence levels. In ABI Mode 6 ("flex mode"), ADP is available every 10 minutes for the Full Disk and Continental United States (CONUS) sectors, and every 5 minutes for the Mesoscale sectors. In ABI Mode 4 ("continuous full disk"), ADP is available every 5 minutes for the Full Disk and CONUS sectors and is not produced for the Mesoscale sectors.

The GOES-R ABI ADP algorithm was updated from the Baseline to the Enterprise algorithm on April 17, 2024. The full description and formats of the baseline ABI ADP are given 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 description will be added to a future PUG revision.

Both the Baseline and the Enterprise versions of the algorithm used to derive ADP from GOES-R ABI observations are described in their respective algorithm theoretical basis documents (ATBDs) located on STAR's GOES-R ATBD webpage: https://www.star.nesdis.noaa.gov/goesr/documentation_ATBDs.php. The Baseline version is described in the document "Algorithm Theoretical Basis Document for ABI Aerosol Detection Product". The Enterprise version is described in the document "Algorithm Theoretical Basis Document for ABI Enterprise Processing System Aerosol Detection Product".

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 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. Users desiring to use GOES-19 ABI Beta maturity ADP data for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA algorithm working group (AWG) scientists for feasibility of the planned applications. These products are sensitive to upstream processing, such as the quality of the calibration, navigation, snow/ice mask and cloud mask.

Known issues being resolved include:
1. False smoke detection over thin clouds over land at large view/solar angles;
2. Occasional false low confidence dust detection over bright surfaces at large view/solar angles, such as over the Andes Mountains.

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

Contacts for specific information on the ABI L2+ ADP product:

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