GOES-19 ABI L2+ Rainfall Rate / QPE Release
Beta Data Quality
October 24, 2024
Read-Me for Data Users

The GOES-19 Advanced Baseline Imager (ABI) L2+ Rainfall Rate (RR) / Quantitative Precipitation Estimate (QPE) product 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 algorithm is running with GOES-16 and GOES-18.

The GOES-R ABI RRQPE product is generated from a single ABI image using ABI bands 8 (6.2µm), 10 (7.3µm), 11 (8.5 µm), 14 (11.2 µm), and 15 (12.3 µm). The RRQPE product is generated every 10 minutes for every ABI Full Disk (FD) of the Earth.

A full description and format of the RRQPE product 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 Baseline algorithm used to derive the RRQPE product from GOES-19 ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Rainfall Rate / QPE", available at https://www.star.nesdis.noaa.gov/goesr/documentation_ATBDs.php.

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. Persons desiring to use the GOES-19 ABI Beta maturity QPE products 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.

The RRQPE product is sensitive to upstream processing that includes the quality of the calibration, navigation, and registration.

Known product issues include:

1. Generally, the ABI Image Navigation and Registration (INR) performance is good, but occasional large anomalies can occur which can result in significant reductions and/or degraded quality in the QPE product.

2. The fixed calibration coefficients mean the algorithm is unable to adapt to changes between cool-season and warm-season rainfall regimes, and may lead to false rainfall signals in clear air over very cold land areas (e.g., Alaska and Canada). This is addressed in the Enterprise version of the RRQPE algorithm, which will replace the current operational Baseline version in the coming months.
3. Like all infrared (IR)-based algorithms, this algorithm performs best for convective rainfall and has a lower level of skill for stratiform rainfall. It should also be noted that the algorithm does not attempt to identify precipitation phase at the surface.
4. This version of the algorithm does not account for sub-cloud evaporation of hydrometeors; consequently, the rain rates may be excessive in arid regions (e.g., intermountain Western United States and Canada). This is addressed in the Enterprise version of the RRQPE algorithm.

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

Contacts for specific information on the ABI L2+ RRQPE product:
Bob Kuligowski: bob.kuligowski@noaa.gov