GOES-17 ABI L2+ Cloud Top Parameters (CTP) Release
Provisional Data Quality
May 6, 2019
Read-Me for Data Users

The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for the GOES-17 Advanced Baseline Imager (ABI) L2+ Cloud Top Parameters (Height, Temperature, and Pressure) Maturity is considered Provisional Maturity for the cold periods of the day as of the Provisional PS-PVR on May 6, 2019.

Up to date information on the GOES-17 cooling system issue can be found on the following web sites:
https://www.goes-r.gov/users/GOES-17-ABI-Performance.html
http://cimss.ssec.wisc.edu/goes-r/abi-/band_statistics_imagery.html

The table shown below is pulled from the above web site and is an estimate of cooling system impacts for 2019. The table lists time periods of potential saturation. Users should be vigilant for potential anomalies during these times. The CTP may be usable during some of these time blocks.

Date Range	Saturation increase/decrease	Time of Day
1 Jan - 26 Feb	Channel saturation goes from marginal to unusable by 26 Feb.	Saturation can occur between 0830 - 1730 UTC.
26 Feb - 20 Mar	Channel saturation goes from unusable to marginal.	Saturation can occur between 0900 - 1700 UTC.
20 Mar - 13 Apr	Channel saturation goes from marginal to unusable by 13 Apr.	Saturation can occur between 0900 - 1700 UTC.
13 Apr - 26 May	Channel saturation goes from unusable to marginal.	Saturation can occur between 0900 - 1700 UTC.
26 May - 20 Jul	No Channel saturation	
20 Jul - 30 Aug	Channel saturation goes from marginal to unusable by 30 Aug.	Saturation can occur between 0900 - 1700 UTC.
30 Aug - 23 Sep	Channel saturation goes from unusable to marginal.	Saturation can occur between 0930 - 1630 UTC.
23 Sep - 16 Oct	Channel saturation goes from marginal to unusable by 16 Oct.	Saturation can occur between 0900 - 1700 UTC.
16 Oct - 12 Dec	Channel saturation goes from unusable to marginal.	Saturation can occur between 0900 - 1700 UTC.

The GOES-17 ABI CTP product generates cloud-top height, cloud-top temperature and cloud-top pressure products from 11 um, 12 um and 13.3 um infrared observations.

The GOES-R Series Level I Requirements (LIRD) are not yet updated to reflect the operational Mode 6; however, for completeness the LIRD requirements are stated here: Cloud Top Height shall be produced every 60 minutes for CONUS and Full Disk, and 5 minutes for Mesoscale. The Cloud Top Pressure will be produced every 60 minutes for CONUS and Full Disk. The Cloud Top Temperature will be produced every 15 minutes for Full Disk, and every 5 minutes for Mesoscale. However, in current normal Mode 3 operations, the CTP product is generated every 15 minutes for Full Disk, every 5 minutes over the CONUS region, and every 1 minute over the Mesoscale regions.

GOES-17 was placed into Mode 6 on April 2, 2019. The cadence of L2 products for Mode 6 are different from Mode 3 and the official requirements defined above. Cloud Top Height is now produced every 10 minutes for Full Disk, every 5 minutes for CONUS, and every 1 minutes for Mesoscale. The Cloud Top Pressure is now produced every 10 minutes for Full Disk, every 5 minutes for CONUS and is NOT produced on the Mesoscale domains. Cloud Top Temperature is produced every 10 minutes for Full Disk, every 1 minute on the Mesoscale domains and is NOT produced on the CONUS domain.

A full description and format of the CTP 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 CTP products from GOES-R ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for ABI Cloud Height" (https://www.goes-r.gov/products/ATBDs/baseline/Cloud_CldHeight_v2.0_no_color.pdf).

Provisional maturity, by definition, means that:

- Validation 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;
- Product analysis is sufficient to communicate to users.
- Documentation of product performance exists.
- Testing has been fully documented;
- Product is ready for operational use and for use in comprehensive cal/val activities and product optimization.

Persons desiring to use the GOES-17 ABI Provisional maturity CTP 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. The CTP product is sensitive to upstream processing that includes the quality of the calibration, navigation, cloud mask, and cloud type/phase.

Status of the current CTP products and any remaining known issues still seeking resolution are as follows:

1. During the post-launch testing of the GOES-17 ABI instrument, an issue with the cooling system was discovered. Because of this, some of the infrared channels on the ABI are not adequately cooled during night time, leading to imagery loss.
2. The CTP products mainly use the 11, 12, and 13 µm infrared channels (ABI Bands 14, 15, and 16). Channel 14 will be available 24 hours although there is still increased noise during the warm detector period, Availability of Channel 15 can be 21 hours, and Channel 16, 18-20 hours each day. However, please see the above table for worst case scenarios. Upstream products such as the Binary Cloud Mask, and Cloud Phase will be affected as well, which in turn adds to the CTP issues. All of these combined will also affect downstream algorithms such as the Derived Motion Winds (DMW) and All Sky Radiances, for example.
3. Mitigation strategies, including using different channel combinations for CTP are currently being tested through the Enterprise Pilot Coordination project. This project will attempt to wrap the cloud height science software into the Ground System. This will allow more flexibility during the heating events.

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

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