

GOES-17 ABI L2+ Derived Motion Winds Release
 Provisional Data Quality
 May 16, 2019
 Read-Me for Data Users

The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for the GOES-17 Advance Baseline Imager (ABI) L2+ Derived Motion Winds (DMW) Provisional Maturity was held on May 16, 2019. As a result of this review, the PS-PVR panel recommended that the ABI Derived Motion Winds product be declared Provisional for the cold, stable periods of the day.

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 times of peak interruption for 2019. The table represents potential saturation. The user should be more vigilant of potential anomalies during these times. The DMW 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-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: Derived Motion Winds shall be produced every 60 minutes for Full Disk, 15 minutes for CONUS, and 5 minutes for Mesoscale.

GOES-17 was placed into Mode 6 on April 2, 2019. Despite this change, the DMW product continues to be generated once an hour for every ABI Full Disk (FD) of the Earth, every 15 minutes over the Continental United States (CONUS) region, and every 5 minutes over the Mesoscale (MESO) regions.

The GOES-17 ABI DMW product is generated from a sequence of images and provides an estimate of atmospheric motion (Speed, Direction, Height) for a set of targeted tracers (cloud edges or moisture gradients in clear air conditions) viewed in selected spectral bands. Winds are retrieved separately from ABI bands 2 (0.64um), 7 (3.9um), 8 (6.2um), 9 (6.9um), 10 (7.3um), and 14 (11.2um). Collectively, the winds retrieved from all of these bands make up the DMW product.

A full description and format of the DMW product 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 DMW product from GOES-R ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Derived Motion Winds" (http://www.goes-r.gov/products/ATBDs/baseline/Winds_DMW_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 product performance to users;
- Documentation of product performance exists;
- Testing has been fully documented; and
- Product is ready for operational use and for use in comprehensive cal/val activities and product optimization.

Provisional 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-17 ABI Provisional maturity Derived Motion Wind product 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. This product is sensitive to upstream processing, such as the quality of the calibration, navigation, cloud mask, cloud type, and cloud top height. In particular, the accuracy of the provisional GOES-17 ABI Derived Motion Winds product may be severely degraded or the product may contain fill values between the hours of 09-18 UTC at times of the year when the ABI focal plane module temperature is significantly elevated as a result of the GOES-17 Loop Heat Pipe (LHP) issue.

Status of the current GOES-17 DMW product and any remaining known issues that are being resolved:

1. The measured performance of the DMW product as measured against reference data indicates that the accuracy and precision specifications (7.5 m/s and 4.2 m/s, respectively) are easily met for all winds generated from each of the ABI bands (i.e., Bands 2, 7, 8 (Cloud Top Water Vapor), 8 (Clear-sky Water Vapor), 9-10 (Clear-Sky Water Vapor), and 14).
2. Misclassification of liquid water cloud edges as ice or mixed phase by the upstream cloud type product leads to a significant underestimation of cloud top pressure. This occurs predominantly at middle levels (400-700hPa) of the atmosphere, which in turn, leads to wind height assignments that are too high up in the atmosphere. This results in significant (~ 2-3 m/s) slow speed biases for the Band 14 derived motion winds at mid-levels (400-700 hPa) of the atmosphere.
3. Slow speed biases on the order of 1m/s are observed with Band 8 (cloud-top water vapor) at around 200 hPa and Band 14 winds in the 200-350 hPa layer. These slow speed biases are the result of upstream cloud top heights (used to derive heights for the derived motion winds) that are too high in the atmosphere. These are typically associated with target scenes that are dominated by optically thin cirrus.

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

Contact for specific information on the ABI L2 Derived Motion Wind product:

Jaime Daniels (Jaime.Daniels@noaa.gov)