

NOUS41 KWBC 302130 AAA  
PNSWSH

Service Change Notice 22-112 Updated  
National Weather Service Headquarters Silver Spring MD  
230 PM EST Mon Jan 30 2023

To:           Subscribers:  
              -NOAA Weather Wire Service  
              -Emergency Managers Weather Information Network  
              -NOAAPort  
              Other NWS Partners, Users and Employees

From:         Ajay Mehta  
              Director, NWS Office of Observations

Subject: Updated: Activation of GOES-R Geostationary Lightning Mapper  
Gridded Data Products on the Satellite Broadcast Network on or after  
March 6, 2023

Updated to:  
- Add guidance for handling the GLMFDSTAT files.  
- Clarify the extent of geographic coverage and tiling scheme.  
- Revise the estimated file counts and data volumes.

On or after March 6, 2023, gridded data products from the Geostationary  
Orbiting Environmental Satellite (GOES)-East and GOES-West Geostationary  
Lightning Mapper (GLM) instruments will become available on the NWS  
Satellite Broadcast Network (SBN), channels GRE & GRW respectively (Ports  
1209, 1210 / PIDs 107, 108).

For each 2x2km cell in the GOES-East or GOES-West fixed-grid coordinate  
system, these data products estimate the following three parameters every  
minute:

Field Name	Units / Semantics
-----	-----
Flash Extent Density (FED)	Flashes per minute
Minimum Flash Area (MFA)	Square kilometer (km2)
Total Optical Energy (TOE)	nanoJoules (nJ = 1e-9 Joules)

GLM detects lightning over an area slightly smaller than the Full Disk  
observed by the Advanced Baseline Imager (ABI). In particular, GLM  
detections extend only to 55 degrees North latitude, thus omitting  
northern Canada and nearly all of Alaska.

The gridded GLM products are tiled into rectangles numbered 000-061 and  
labeled "PAA" through "PCJ", as depicted below:

000 001 002 003	PAA PAB PAC PAD
004 005 006 007 008 009	PAE PAF PAG PAH PAI PAJ
010 011 012 013 014 015	PAK PAL PAM PAN PAO PAP
016 017 018 019 020 021	PAQ PAR PAS PAT PAU PAV
022 023 024 025 026 027	PAW PAX PAY PAZ PBA PBB

028	029	030	031	032	033	PBC	PBD	PBE	PBF	PBG	PBH
034	035	036	037	038	039	PBI	PBJ	PBK	PBL	PBM	PBN
040	041	042	043	044	045	PBO	PBP	PBQ	PBR	PBS	PBT
046	047	048	049	050	051	PBU	PBV	PBW	PBX	PBY	PBZ
052	053	054	055	056	057	PCA	PCB	PCC	PCD	PCE	PCF
058	059	060	061			PCG	PCH	PCI	PCJ		

Both GOES-East and GOES-West gridded GLM products use this tiling scheme. Tile numbers (000-061), defined by the GOES-R Ground System, appear within the files; the corresponding tile labels (PAA-PCJ) appear in WMO headers. (See details below.)

These lightning products follow a "punctured" tiling scheme: in each minute, only tiles with at least one lightning flash detected (i.e., tiles with content) are produced. Thus in each minute, many fewer than 62 tiles are produced.

(In each minute, a separate "GLMFDSTAT" file is also produced for each satellite, listing which gridded GLM tiles were produced in that minute. This file is not needed to handle the 1-minute tiles; but may be used to aggregate lightning activity, e.g., every 5 or 30 minutes. GLMFDSTAT files are labeled "PZZ" in World Meteorological Organization (WMO) headers to distinguish them from the gridded GLM data tiles.)

Each tile's rows and columns are defined in geostationary sensor coordinates (i.e., view angles); each file includes the projection details needed to transform these sensor coordinates into longitude and latitude positions on the earth.

Further details on these gridded GLM products are available from the University of Maryland (<https://lightning.umd.edu/glm/>) and the NOAA Virtual Laboratory (VLab) (<https://vlab.noaa.gov/web/towr-s/glm> - including explanatory graphics and links to sample files).

The gridded GLM products (data tiles and GLMFDSTAT files) have the following WMO headers, SBN channels, cadence, file counts and data volumes:

Satellite	WMO header	SBN Channel	Cadence	Files/day*	GB/day*
-----	-----	-----	-----	-----	-----
GOES-East	TIRS00 KNES	GRE	1 minute	24,200	1.99
GOES-West	TIRT00 KNES	GRW	1 minute	10,600	0.87

(\* These numbers are approximate and will vary with weather conditions, due to data compression and the "punctured" tiling scheme detailed above.)

The WMO headers listed above are followed by labels "PAA" through "PCJ" (for data tiles) or "PZZ" (for GLMFDSTAT files). Thus, the full WMO headers for gridded GLM have the following patterns:

TIRS00 KNES DDhhmm Pxx (GOES-East)  
TIRT00 KNES DDhhmm Pxx (GOES-West)  
(where Pxx: PAA - PCJ for tiles; PZZ for GLMFDSTAT files)

To ingest and display the gridded GLM data products, SBN receiving sites will need to configure their systems to receive and handle the gridded GLM data and the GLMFDSTAT files, and to distinguish them from each other and from ABI Full Disk imagery (which uses similar WMO headers).

Critical weather or other factors may affect the timing of this change on the SBN.

For questions pertaining to these changes, please contact:

NOAA/NWS Office of Observations  
Silver Spring, MD  
Email: [nws-obs-satellites@noaa.gov](mailto:nws-obs-satellites@noaa.gov)

or

AWIPS Network Control Facility (NCF) Help Desk  
NOAA/NWS Office of Central Processing  
Silver Spring, MD  
Phone: 888-808-8624

For questions regarding the content or distribution of the products listed here, please contact:

Stephen Superczynski  
GOES-R User Services Coordinator  
Greenbelt, MD  
Email: [stephen.superczynski@noaa.gov](mailto:stephen.superczynski@noaa.gov)

National Service Change Notices are online at:

<https://www.weather.gov/notification/>

NNNN