

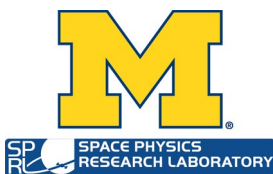
CYCLONE GLOBAL NAVIGATION SATELLITE SYSTEM (CYGNSS)



Level 3 Merged Storm Storage Scheme	UM Doc. No.	148-0409-1
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Prepared by: Anthony Russel

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Revision Notice

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1. Introduction

The CYGNSS L3 Merged file is a Level 3 gridded product that merges the CYGNSS Young Sea Limited Fetch (YSLF) winds with the Fully Developed Sea (FDS) winds based around the storm track information provided from the National Hurricane Center (NHC) and Joint Typhoon Warning Center (JTWC). The storm track files provide critical information used to decide how to blend the CYGNSS YSLF wind speeds, which better capture high speeds, and FDS wind speed, which better capture lower winds speeds.

The NHC'S Automated Tropical Cyclone Forecast (ATCF) site provides a low latency source for storm tracks, as well as an archive of post-season verified tracks, for the eastern Pacific Ocean and Atlantic Ocean storms. The JTWC provides archival products for the western Pacific Ocean, Southern Hemisphere, and northern Indian Ocean storms.

The CYGNSS L3 Merged product is generated for each storm using the CYGNSS SDR L2 and L3 products and storm track file as inputs.

2. Acronyms and Abbreviations

ATCF	Automated Tropical Cyclone Forecast
CYGNSS	Cyclone Global Navigation Satellite System
FDS	Fully Developed Sea
JTWC	Joint Typhoon Warning Center
L0	Level 0
L1	Level 1
L2	Level 2
L3	Level 3
NHC	National Hurricane Center
netCDF	Network Common Data Form
PO.DACC	(NASA) Physical Oceanography Distributed Active Archive Center
SDR	Scientific Data Record
SOC	(CYGNSS) Science Operations Center
SPRL	(University of Michigan) Space Physics Research Laboratory
YSLF	Young Sea Limited Fetch

3. Data Products

There are three different latency levels at which the CYGNSS L3 Merged product will be delivered: archival, intermediate latency, and near real-time. The archival product can be generated for all storm basins while the other products will only be generated with the NHC's data for the Atlantic and eastern Pacific basins.

3.1 Archival

The product is generated using the NHC or JTWC's archival Best Track products. These storms tracks have undergone post-season reanalysis and are typically made available during the

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summer or fall the following year. This data product will include all of the CYGNSS L0 data that is expected to be received.

This product will be made publicly available via the PO.DAAC.

3.2 Intermediate Latency

This product is generated using the NHC's current season Best Track product with final versions of the CYGNSS L2 and L3 data products. A daily check will be made for each storm to find if either an update to the storm track file has been received or new CYGNSS data was added within the date range of the storm.

This product will be made publicly available via the PO.DAAC.

3.3 Near Real-time:

This product is generated using the NHC's current season Best Track product and all available CYGNSS data. This product will work around gaps in CYGNSS data and use everything that is available to be able to generate the lowest latency version of the L3 Merged product. It is expected that this product will be generated multiple times a day as new CYGNSS L0 data and storm track files are updated.

This distribution method of this product is still under discussion.

4. Directory Structure

The CYGNSS products typically use a year/day of year file organization method. The L3 Merged product does not fit into this storage method since the files are generated on a per-storm basis and can span multiple days. The files will instead be sorted based on data product and year.

TTTT/YYYY/*

TTTT: Data product. 'nrt' = near real-time, 'inter' = intermediate latency, and 'archive' = archival track.

YYYY = 4-digit Year

5. File Naming Convention

Each CYGNSS Level 3 Merged file is differentiated by the storm it pertains to, its version number, and the method used to process the data. While the file naming convention is similar across all data products, the lower latency data products also include a processing date to distinguish between the numerous versions generated while the storm is active. Naming conventions details and examples are provided below.

Archive file:

cyg.ddmi.NNNN.BB.YYYY.SS.l3.merge-grid-wind.archive.aAA.dVV.nc

Intermediate latency file:

cyg.ddmi.NNNN.BB.YYYY.SS.l3.merge-grid-wind.inter-vYYYYMMDD-HHMMSS.aAA.dVV.nc

Near real-time file:

cyg.ddmi.NNNN.BB.YYYY.SS.l3.merge-grid-wind.nrt-vYYYYMMDD-HHMMSS.aAA.dVV.nc

cyg: Spacecraft/Mission identifier, where "cyg" refers to the CYGNSS constellation and NASA EV mission title.

ddmi: Primary remote sensing subsystem known as the "Delay Doppler Mapping Instrument", or "ddmi".

NNNN: Storm name, the World Meteorological Organization (WMO) assigned storm name.

BB: Basin, where BB is the two character identifier of the storm basin. E.g, ep = Eastern Pacific.

YYYY: Year in which the storm existed.

SS: Storm number, where SS is a unique storm number assigned to each storm in a basin. E.g, 10 in this field would indicate that it is the 10th storm in a given basin for the year.

l3: Data Processing Level 3.

merge-grid-wind: Primary Measurement, merged YSLF and FDS wind speed.

vYYYYMMDD-HHMMSS: Timestamp of the L3 Merged file generation. Only output in the near real-time and intermediate products where multiple versions of the same storm will be processed for one algorithm and dataset version.

aAA: Algorithm version, where AA is the numerical algorithm version identifier. E.g., "a20" = Algorithm Version 2.0. Note: the Algorithm version is numerically de-coupled from the Dataset Version (see below).

dVV: Dataset version, where VV is the numerical dataset version identifier. E.g., "d20" = Dataset Version 2.0. Note: the Dataset version is numerically de-coupled from the Algorithm Version (see above).

nc: File type: "nc" = netCDF.

6. Example File Paths

archive/2019/cyg.ddmi.MICHAEL.al.2018.14.l3.merge-grid-wind.archive.a10.d10.nc

inter/2022/cyg.ddmi.LISA.al.2022.04.15.merge-grid-wind.inter-v20230212-010203.a31.d35.nc

nrt/2022/cyg.ddmi.BONNIE.ep.2022.04.l3.merge-grid-wind.nrt-v20220808-210443.a52.d58.nc

7. Storm Track Sources

NHC's Best Track data files for the current storm season:

<https://ftp.nhc.noaa.gov/atcf/btk>

NHC's archival Best Track Data files which have undergone post-season verification:

<https://ftp.nhc.noaa.gov/atcf/archive>

JTWC's quality controlled Best Track Data files:

<https://www.metoc.navy.mil/jtwc/jtwc.html?western-pacific>