GLOBAL DATA ASSEMBLY CENTER (GDAC) REPORT TO THE GHRSST SCIENCE TEAM

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ABSTRACT

In 2017-2018 the Global Data Assembly Center (GDAC) at NASA's Physical Oceanography Distributed Active Archive Center (PO.DAAC) provided ingest, archive, distribution and user services for GHRSST operational data streams with improved and evolved tools, services, and tutorials and interfaced with the user community to address technical inquiries. The GDAC provided access to new GHRSST datasets as well retired a significant number of deprecated GHRSST datasets from its discovery services. The following sections summarize and document the specific achievements of the GDAC to the GHRSST community.

1. Introduction

The primary contributions to GHRSST for this period are in three categories: Data Management and User Services, Tools and Services, and R/G TS evolution. For data management, the GDAC ingested 12 new GHRSST datasets from multiple data providers (RDACs) and retired 40 obsoleted/superseded datasets, including 26 Level-2, 2 Level-3 and 14 Level-4 datasets (see Appendix I and II). The GDAC continued to support operational data streams for L2P/L3/L4 data from 15 unique RDACs and maintain linkages to the NASA Common Metadata Repository (CMR; https://search.earthdata.nasa.gov/search) and LTSRF archive. For user community engagement the PO.DAAC responded to GHRSST user queries through its help desk and user forum, improved data recipes with data and tutorials (also promulgated on the PO.DAAC user forum) and provided expertise and education in the use and implementation of PO.DAAC Drive, the emerging FTP replacement service. The tools and services set to serve the GHRSST user community needs for data access, subsetting and visualization continues to improve and evolve, and is substantial (see Sections 3 and 4). Members of the PO.DAAC also collaborated on the recommendation to re architect the Regional Global Task Sharing (R/G TS) framework to decentralize the GHRSST data ingest and distribution nodes that culminated in a formal proposal to the GHRSST Science Team.

2. Distribution metrics

The following figures show distribution metrics and relative popularity of GHRSST datasets. On a monthly or annual basis GHRSST datasets are consistently among the most popular products in the entire PO.DAAC catalog. Users, data volumes and number of files are all steady or have slightly increased. Users are continuing to leverage services such as OPeNDAP, THREDDS and LAS more so than in the past.

Top 10 Datasets for FTP by users during 2018

Rank	Name	Tool	Files	Volume (GB)	Users
1	PODAAC-GMSLM-TJ142 Global Mean Sea Level Trend from Integrated Multi-Mission Ocean Altimeters TOPEX/Poseidon Jason-1 and OSTM/Jason-2 Version 4.2	FTP	7260	0.76	4183
2	PODAAC-GHMDT-2PJ02 GHRSST Level 2P Global Skin Sea Surface Temperature from the Moderate Resolution Imaging Spectroradiometer (MODIS) on the NASA Terra satellite	FTP	440305	8562.10	3205
3	PODAAC-GMSLM-TJ124 Global Mean Sea Level Trend from Integrated Multi-Mission Ocean Altimeters TOPEX/Poseidon Jason-1 and OSTM/Jason-2 Version 4	FTP	1943	0.21	1134
4	PODAAC-TEMSC-ANTS1 Antarctica Mass Variability Time Series Version 1 from JPL GRACE Mascon CRI Filtered	FTP	5119	0.03	842
5	PODAAC-OSCAR-03D01 OSCAR third degree resolution ocean surface currents	FTP	38410	1109.95	652
6	PODAAC-GHGMR-4FJ04 GHRSST Level 4 MUR Global Foundation Sea Surface Temperature Analysis (v4.1)	FTP	178045	41930.37	573
7	PODAAC-GHGMR-4FJ01 GHRSST Level 4 MUR Global Foundation Sea Surface Temperature Analysis	FTP	181228	29.24	525
8	PODAAC-TEMSC-GRTS1 Greenland Mass Variability Time Series Version 1 from JPL GRACE Mascon CRI Filtered	FTP	4582	0.03	523
9	PODAAC-TEMSC-SFC01 MASCON CLMR4 Scale Factor with CRI Filter	FTP	2905	2.96	451
10	PODAAC-TEMSC-LMC01 MASCON Land Mask used with CRI filter	FTP	2334	2.36	420

Figure 1. Top 10 Datasets for FTP by users during 2018 showing the relative popularity (by Users) of the GHRSST MODIS L2P and MUR L4 datasets.

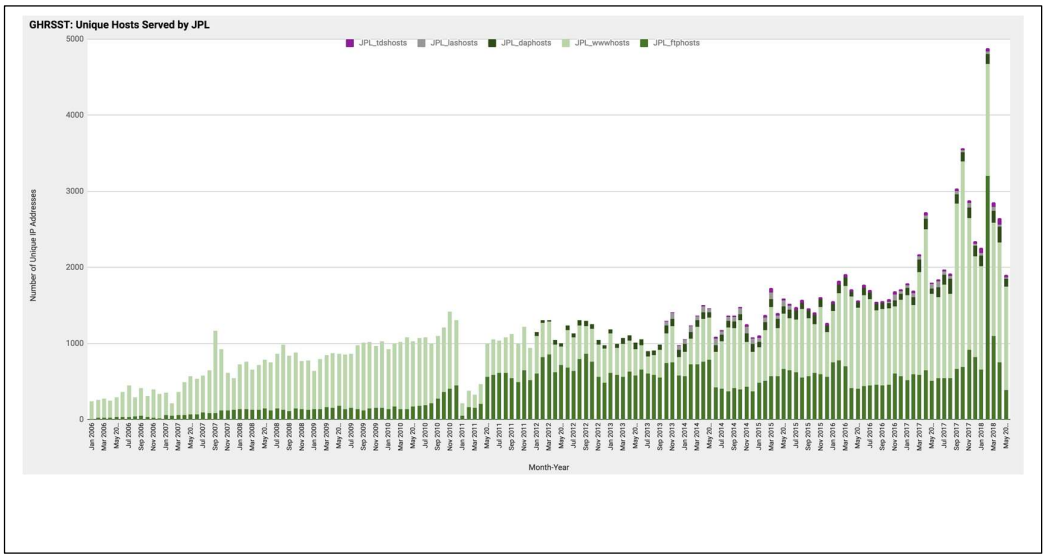

Figure 2. Monthly unique users by FTP, OPeNDAP, THREDDS, LAS or WWW since 2006. Results up to mid-May 2018.

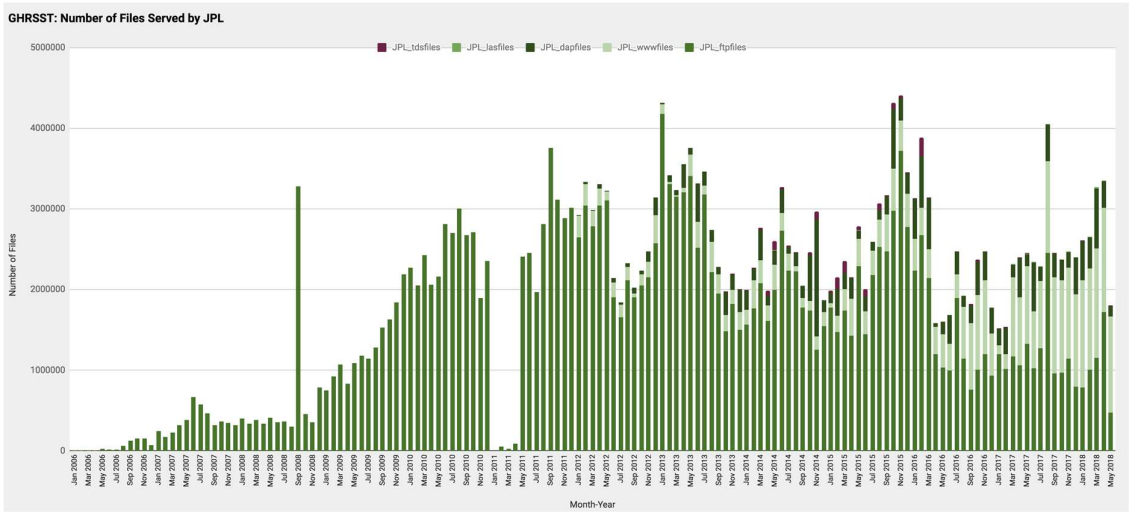

Figure 3. Number of monthly files distributed.

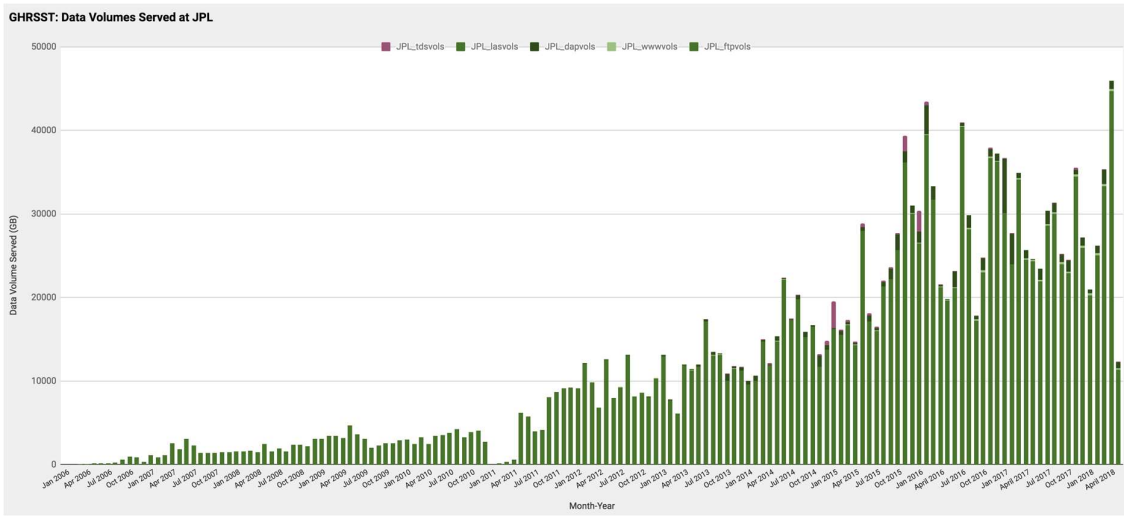

Figure 4. Volume of monthly files (GBs) distributed. Recent record month of 45 TBs distributed (March 2018).

3. Current Tool Summary

The following list summarizes the list of available tools and services and their locations for GHRSST data.

- SOTO (State of the Ocean version 4.2): visualization including GHRSST MODIS L2P, MUR L4, SMAP SSS.
    - https://podaac-tools.jpl.nasa.gov/soto

- HiTIDE: GUI based L2 subsetting tool, New version to be released in 2018.
    - https://podaac-tools.jpl.nasa.gov/hitide/
- PO.DAAC Web Services: search, discovery, metadata, extract as “chained” services.
    - https://podaac.jpl.nasa.gov/ws
- OPeNDAP: Subsetting for L2/L3/L4
    - https://opendap.jpl.nasa.gov/opendap/OceanTemperature/ghrsst/data/GDS2/contents.html
- THREDDS: Dataset aggregation and subsetting for gridded datasets
    - https://thredds.jpl.nasa.gov/thredds/catalog_ghrsst_gds2.html
- Live Access Server (LAS) for L3/L4 subsetting and visualization
    - https://podaac-tools.jpl.nasa.gov/las/UI.vm
- Webification (w10n-sci): Arbitrary data store exposed as URLs. Subsetting by value.
    - https://podaac-w10n.jpl.nasa.gov/allData/ghrsst/data/GDS2/
- Metadata Compliance Checker: Granule level CF and ACDD metadata reports.
    - https://podaac-uat.jpl.nasa.gov/mcc/

4. New and Emerging Technologies

The GDAC presentation at the GHRSST-19th Meeting also focused on new emerging tools and services, including the PO.DAAC Drive service which will replace FTP in the very near future. “Drive” can be accessed with this link: https://podaac-uat.jpl.nasa.gov/drive after establishing NASA login credentials here: https://urs.earthdata.nasa.gov/users/new . Tutorials on how to setup PO.DAAC Drive are also found on the PO.DAAC forum. One advantage of Drive is that it allows users to virtually mount the entire PO.DAAC data store as if it were a local directory on their computer. Other emerging technologies include a NASA AIST funded activity called OceanWorks (https://oceanworks.jpl.nasa.gov/) that provides a new paradigm for data storage and fast access to perform dataset discovery, in situ to satellite matchup capability, satellite data analytics including climatologies, visualization and data extraction. Two talks at the GHRSST-19th Meeting focused on this technology and its applications.

Acknowledgements

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Appendix I, New and updated GHRSST datasets ingested in the last 12 months

Process Level	Sensors	RDAC	Resolution	Short Name	Persistent ID
Level2	VIIRS	JPL	0.75 km	VIIRS_NPP-JPL-L2P-v2016.0	PODAAC-GHVRS-2PN16
Level2	VIIRS	OSPO	0.75 km	VIIRS_NPP-OSPO-L2P-v2.41	PODAAC-GHVRS-2PO41
Level2	VIIRS	NAVO	0.75 km	VIIRS_NPP-NAVO-L2P-v3.0	PODAAC-GHVRS-2PN30
Level2	AMSR2	RSS	25 km	AMSR2-REMSS-L2P-v8a	PODAAC-GHAM2-2PR8A
Level3	AMSR2	RSS	25 km	AMSR2-REMSS-L3U-v8a	PODAAC-GHAM2-3UR8A
Level3	WindSat	RSS	25 km	WindSat-REMSS-L3U-v7.0.1a	PODAAC-GHWSA-3UR7A
Level3	GMI	RSS	25 km	GMI-REMSS-L3U-v8.2a	PODAAC-GHGMI-3UR8A
Level3	TMI	RSS	25 km	TMI-REMSS-L3U-v7.1a	PODAAC-GHTMI-3UR71
Level3	VIIRS	OSPO	2 km	VIIRS_NPP-OSPO-L3U-v2.4	PODAAC-GHVRS-3UO24

Level4	mw_ir_OI	REMSS	8 km	MW_IR_OI-REMSS-L4-GLOB-v5.0	PODAAC-GHMWI-4FR05
Level4	mw_ir_rt_OI	REMSS	25 km	MW_OI-REMSS-L4-GLOB-v5.0	PODAAC-GHMWO-4FR05

Appendix II, Retired GHRSST dataset table

Process Level	Sensors	RDAC	Resolution	Short Name	Persistent ID
Level2	AVHRR	NAVO	8.8 km	EUR-L2P-AVHRR16_G	PODAAC-GH16G-2PE01
Level2	AVHRR	NAVO	2.2 km	EUR-L2P-AVHRR16_L	PODAAC-GH16L-2PE01
Level2	AVHRR	NAVO	8.8 km	EUR-L2P-AVHRR17_G	PODAAC-GH17G-2PE01
Level2	AVHRR	NAVO	2.2 km	EUR-L2P-AVHRR17_L	PODAAC-GH17L-2PE01
Level2	AVHRR	NERC	1.1 km	NEODAAS-L2P-AVHRR17_L	PODAAC-GH17L-2PS01
Level2	AVHRR	NERC	1.1 km	NEODAAS-L2P-AVHRR18_L	PODAAC-GH18L-2PS01
Level2	AVHRR	OSI-SAF	2 km	EUR-L2P-NAR16_SST	PODAAC-GHN16-2PE01
Level2	AVHRR	OSI-SAF	3 km	EUR-L2P-NAR17_SST	PODAAC-GHN17-2PE01
Level2	AVHRR	OSI-SAF	4 km	EUR-L2P-NAR18_SST	PODAAC-GHN18-2PE01
Level2	AMSRE	REMSS	25 km	REMSS-L2P_GRIDDED_25-AMSRE	PODAAC-GHAMS-2GR01
Level2	AMSRE	REMSS	25 km	REMSS-L2P-AMSRE	PODAAC-GHAMS-2PR01
Level2	AMSRE	OSI SAF	25 km	EUR-L2P-AMSRE	PODAAC-GHAMS-2PE01
Level2	AATSR	EUM	0 km	EUR-L2P-ATS_NR_2P	PODAAC-GHATS-2PE01
Level2	GOES	OSDPD	4 km	OSDPD-L2P-GOES11	PODAAC-GHG11-2PO01
Level2	GOES	OSDPD	4 km	OSDPD-L2P-GOES12	PODAAC-GHG12-2PO01
Level2	GOES	OSDPD	4 km	OSDPD-L2P-GOES13	PODAAC-GHG13-2PO01
Level2	GOES	OSDPD	4 km	OSDPD-L2P-GOES15	PODAAC-GHG15-2PO01

Level2	MODIS	JPL	1 km	JPL-L2P-MODIS_A	PODAAC-GHMDA-2PJ01
Level2	MODIS	JPL	1 km	JPL-L2P-MODIS_T	PODAAC-GHMDT-2PJ01
Level2	SEVIRI	CMS	11.6	EUR-L2P-SEVIRI_SST	PODAAC-GHSEV-2PE01
Level2	SEVIRI	OSDPD	4.5	OSDPD-L2P-MSG02	PODAAC-GHMG2-2PO01
Level2	MTSAT	OSDPD	4 km	OSDPD-L2P-MTSAT1R	PODAAC-GHMT1-2PO01
Level2	MTSAT	OSDPD	4 km	OSDPD-L2P-MTSAT2	PODAAC-GHMT2-2PO01
Level2	TMI	REMSS	25 km	REMSS-L2P_GRIDDED_25-TMI	PODAAC-GHTMI-2GR01
Level2	TMI	REMSS	25 km	EUR-L2P-TMI	PODAAC-GHTMI-2PE01
Level2	TMI	REMSS	25 km	REMSS-L2P-TMI	PODAAC-GHTMI-2PR01
Level3	AVHRR	OSI SAF	5 km	EUR-L3P-GLOB_AVHRR_METOP_A	PODAAC-GHGMT-3PE01
Level3	AVHRR	OSI SAF	2 km	EUR-L3P-NAR_AVHRR_METOP_A	PODAAC-GHNMT-3PE01
Level4	AVHRR_OI	NCDC	25 km	NCDC-L4LRblend-GLOB-AVHRR_OI	PODAAC-GHAAO-4BC01
Level4	MUR	JPL	1 km	JPL-L4UHfnd-GLOB-MUR	PODAAC-GHGMR-4FJ01
Level4	ODYSSEA	ODYSSEA	10 km	EUR-L4HRfnd-GLOB-ODYSSEA	PODAAC-GHGOY-4FE01
Level4	ODYSSEA	ODYSSEA	2 km	EUR-L4UHRfnd-GAL-ODYSSEA	PODAAC-GHLOY-4FE01
Level4	EUR	ODYSSEA	2 km	EUR-L4UHFnd-MED-v01	PODAAC-GHMED-4FE01
Level4	ODYSSEA	ODYSSEA	2 km	EUR-L4UHRfnd-MED-ODYSSEA	PODAAC-GHMOY-4FE01
Level4	mw_ir_OI	REMSS	8 km	REMSS-L4HRfnd-GLOB-mw_ir_OI	PODAAC-GHMWI-4FR01
Level4	mw_ir_rt_OI	REMSS	8 km	REMSS-L4HRfnd-GLOB-mw_ir_rt_OI	PODAAC-GHMWR-4FR01
Level4	MUR	JPL	1 km	JPL-L4UHfnd-NCAMERICA-MUR	PODAAC-GHNMR-4FJ01
Level4	ODYSSEA	ODYSSEA	2 km	EUR-L4UHRfnd-NWE-ODYSSEA	PODAAC-GHNOY-4FE01
Level4	MODIS-AMSRE	JPL	1 km	JPL-L4UHblend-NCAMERICA-RTO_SST_Ad	PODAAC-GHRAD-4FJ01
Level4	MODIS-AMSRE	JPL	1 km	JPL-L4UHblend-NCAMERICA-RTO_SST_An	PODAAC-GHRAN-4FJ01
Level4	MODIS-AMSRE	JPL	1 km	JPL-L4UHblend-NCAMERICA-RTO_SST_Td	PODAAC-GHRTD-4FJ01
Level4	MODIS-AMSRE	JPL	1 km	JPL-L4UHblend-NCAMERICA-RTO_SST_Tn	PODAAC-GHRTN-4FJ01