Task Team: Regional GHRSST Task sharing

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Objective of this task team

Specification of GHRSST system, interface and architecture

- Format specifications
- To define the roles and interactions between GHRSST entities
- To define the minimum services and interfaces to be implemented to serve GHRSST data
- To ensure the overall GHRSST system operates according to specifications
- To support GHRSST parners to implement the required services and interfaces

Team Members of the TT

One contact point per GDP or DAC.

Senior researchers:
Sheekela Baker, Helen Beggs, Kenneth Casey, Mitsuhiko Fuda, Pallavi Govekar, Jacob Høyer, Sasha Ignatov, Bruce McKenzie, Kachi Misako, Hideyuki Muramatsu, Korak Saha, Igor Tomazic, Cristina Tronconi, Yongsheng Zhang

Early career researchers:
Nope, not in our prime anymore... We need fresh blood.

GDS Table of GHRSST Entities

Entity Code	GHRSST RDAC Name	GDP (GHRSST data producers)	DAC (data assembly centres)	Other distribution DAC	Contact
ABOM	Australian Bureau of Meteorology	Y	Y	JPL	[redacted]
CMC	Canadian Meteorological Centre	Y		JPL	[redacted]
DMI	Danish Meteorological Institute	Y	Y	JPL CMEMS	[redacted]
IFR	Ifremer	Y	Y		[redacted]
JPL	JPL Physical Oceanography Distributed Active Archive Center	Y	Y		[redacted]
METNO	Norwegian Meteorological Institute	Y	Y		[redacted]
CMEMS	Copernicus Marine Service	Y	Y		[redacted]
NAVO	Naval Oceanographic Office	Y		JPL	[redacted]
NCEI	National Centers for Environmental Information	Y	Y		[redacted]
OSPO	NOAA Office of Satellite and Product Operations	Y		JPL NCEI	[redacted]
OSISAF	EUMETSAT Ocean and Sea Ice Satellite Applications Facility	Y	Y		[redacted]

GDS Table of GHRSST Entities

Entity Code	GHRSST RDAC Name	GDP	DAC	Other distribution DAC	Contact
REMSS	Remote Sensing Systems, CA, USA	Y		JPL	[redacted]
RSMAS	University of Miami, RSMAS	Y			[redacted]
STAR	NOAA Center for Satellite Applications and Research	Y		JPL NCEI	[redacted]
UKMO	UK Meteorological Office	Y		JPL CMEMS	[redacted]
ESACCI	ESA SST Climate Change Initiative	Y	Y		[redacted]
JAXA	Japan Aerospace Exploration Agency	Y	Y		[redacted]
MAR	EUMETSAT	Y	Y		[redacted]

Deliverables Scheduled 2022-2023

GHRSST GDS 2.1 and dynamic tables: 07/2022

GHRSST R/G TS System Architecture GSA (https://doi.org/10.5281/zenodo.4926440)

GHRSST Central Catalogue: 07/2022

GHRSST Central Catalogue User Manual: 07/2022

Opensearch federated search service: 07/2022

Opensearch example notebook: 07/2022

GHRSST Central Catalogue and Opensearch service implementation was funded by Copernicus through EUMETSAT

Shared documentation, software and results

Your slack channel (not used so far):
https://ghrsstworkspace.slack.com/archives/C024GTYJABH

Github: https://github.com/GHRSST/ghrsst-opensearch

Moodle page (not used out of GHRSST meeting):
https://training.eumetsat.int/course/view.php?id=368&section=2

Zenodo for GHRSST documents:
https://zenodo.org/communities/ghrsst/

GDS 2.1

- We have a new GDS (2.1)
- Includes changes discussed before but properly accessible from GHRSST web site
- Dynamic tables moved to GHRSST web pages: https://www.ghrsst.org/resources/ghrsst-data-specification-gds-tables/
- Fixed inconsistencies in format description
  - **source_of**_... Instead of sources_of_...
  - Corrected some attribute descriptions
  - Fixed examples
- Thoughts for future:
  - Removing scaling (replace with float / significant digits)
  - New cloud optimized format (NetCDF, Zarr)
  - Chunking
  - Object storage
  - On the fly data transformation (e.g. internal cloud storage to GDS NetCDF)
  - Intake / STAC

GHRSST Central Catalogue

- https://www.ghrsst.org/ghrsst-data-services/ghrsst-catalogue
- Currently password protected until public release (beware ongoing changes):
- What we still need to do:
  - Populate initial catalogue from PO.DAAC harvesting (repeated because of changes, e.g. cloud migration) [Ifremer]
  - Freeze harvest from PO.DAAC, no more import possible [Ifremer]
  - Clean: remove duplicates (merge information), obsolete products, mismatched information [Ifremer, R/G TS Team]
  - Update GDS table of dataset identifiers [GDPs/DACs]
  - Cross GDS table of dataset identifiers with catalogue [R/G TS Team]
  - Add complementary information from NOAA catalogue: missing datasets, additional access points, … manual editing [NOAA]
  - Update dataset description [GDPs/DACs]

GHRSST
GROUP FOR HIGH RESOLUTION SEA SURFACE TEMPERATURE

Group for High Resolution Sea Surface Temperature

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- Platform
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- Level
- Latency
- Spatial Resolution
- Producer
- Distributor
- Geographic area

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GHRSST Level 2P Global Skin Sea Surface Temperature from the Advanced Very High Resolution Radi...

Project(s): GHRSST
Platform(s): METOP-A
Instrument(s): AVHRR-3
Parameters(s): Ocean Temperature
Temporal resolution:
Spatial resolution: 6.2 km

GHRSST Level 4 CMC0.1deg Global Foundation Sea Surface Temperature Analysis (GDS version 2)

Project(s): GHRSST
Platform(s): NOAA-19, NOAA-20, MOORINGS, Suomi-NPP, GCOM-W1, METOP-A, METOP-B
Instrument(s): AVHRR, AVHRR, DRIFTING BUOYS, VIIRS, AMSR2, AVHRR-3, AVHRR-3
Parameters(s): Ocean Temperature
Temporal resolution:

ODYSSEA Global Sea Surface Temperature Gridded Level 3S Daily Multi-Sensor Observations

Project(s): GHRSST, CMEMS
Platform(s): NOAA-18, NOAA-19, METOP-A, Envisat, AQUA, TRMM, MSG-1, GOES-11, GCOM-W1, Suomi NPP, NOAA-20, Sentinel-3 A, Sentinel-3 B, METOP-B, Himawari-8, GOES-17, GOES-18, MSG-4
Instrument(s): AVHRR, AVHRR, AVHRR, ...

GHRSST Level 2P Global 1m Sea Surface Temperature from the Advanced Very High Resolution Radiometer...

Project(s): GHRSST
Platform(s): NOAA-19
Instrument(s): AVHRR-3
Parameters(s): Ocean Temperature
Temporal resolution:
Spatial resolution: 8.8 km

GHRSST Level 4 AVHRR_OI Global Blended Sea Surface Temperature Analysis (GDS2) from NCEI

Project(s): GHRSST
Platform(s): NOAA-11, NOAA-14, NOAA-9, NOAA-16, NOAA-17, NOAA-19, METOP-A, METOP-B, NOAA-7
Instrument(s): AVHRR-2, AVHRR-2, AVHRR-2, AVHRR-3, AVHRR-3, AVHRR-3, AVHRR-3, AVHRR-2 ...

GHRSST Level 3U Global Near-Real-Time Subskin Sea Surface Temperature version 8a from the Advanced ...

Project(s): GHRSST
Platform(s): GCOM-W1
Instrument(s): AMSR2
Parameters(s): Ocean Temperature
Temporal resolution:
Spatial resolution: 0.25 degree

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Group for High Resolution Sea Surface Temperature

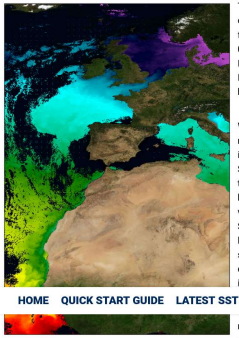
Search...

PROTECTED: GHRSST CATALOGUE

ODYSSEA North-East Atlantic Sea Surface Temperature Gridded Level 3S Daily Multi-Sensor Observations

View Back

Version 2.0 Status On going



This dataset provide a times series of daily multi-sensor composite fields of Sea Surface Temperature (SST) foundation at ultra high resolution (UHR) on a 0.02 x 0.02 degree grid (approximately 2 x 2 km) for the North-East Atlantic (European North West shelf, Iberia, Bay of Biscay, Irish Sea down to Canary upwelling), every 24 hours.

Whereas along swath observation data essentially represent the skin or sub-skin SST, the L3S SST product is defined to represent the SST foundation (SSTfnd). SSTfnd is defined within GHRSST as the temperature at the base of the diurnal thermocline. It is so named because it represents the foundation temperature on which the diurnal thermocline develops during the day. SSTfnd changes only gradually along with the upper layer of the ocean, and by definition it is independent of skin SST fluctuations due to wind- and radiation-dependent diurnal stratification or skin layer response. It is therefore updated at intervals of 24 hrs. SSTfnd comes closest to being detected by infrared and microwave radiometers during the night, when the previous day's diurnal stratification can be assumed to have decayed.

The processing combines the observations of multiple polar orbiting and geostationary satellites, embedding infrared of microwave radiometers. All these sources are intercalibrated with each other before merging. A ranking procedure is used to select the best sensor observation for each grid point. The processing is the same (minus the optimal interpolation step) as for the Atlantic Near Real Time (NRT) L4 dataset available on Copernicus Marine Service [SST_ATL_SST_L4_NRT_OBSERVATIONS_010_025 dataset] and users can refer to the user manual and quality documents available there for more details.

This dataset is generated daily within a 24 delay and is therefore suitable for assimilation into operational models.

Author(s) Jean-François Piollé (Ifremer / LOPS) , Emmanuelle Autret (Ifremer / LOPS)
Publication date 2018-01-01

/OCEAN TEMPERATURE/SEA SURFACE TEMPERATURE

Data access

Access policy OtherRestrictions
Usage policy CC-BY (Creative Commons - Attribution)
Format(s) NetCDF 4

Local path
Local path on Ifremer / Datarmor: /home/ref-cersat-public/sea-surface-temperature/odyssea/l3s/atl/nrt/data/

FTP
Ifremer FTP server: ftp://ftp.ifremer.fr/ifremer/cersat/data/sea-surface-temperature/odyssea/l3s/atl/nrt/data/

HTTPS
Ifremer HTTP server: https://data-cersat.ifremer.fr/data/sea-surface-temperature/odyssea/l3s/atl/nrt/data/

Citation Piollé J.-F., Autret, E. (2018). ODYSSEA North East Atlantic Sea Surface Temperature Multi-sensor L3S Observations (IFR-L3S-ATL-ODYSSEA) (Version 2) set. Obtained from CERSAT / Ifremer, Plouzane, France. Dataset accessed [YYYY-MM-DD].

Resource(s)

User guide
Product User Manual (PUM): http://marine.copernicus.eu/documents/PUM/CMEMS-SST-PUM-010-010-025.pdf

ID: IFR-L3S-ATL-ODYSSEA

Project(s) GHRSST

Product
Level L3S
Acquisition pattern composite
Compositing Collated
Latency Less than 24 hours

Observation source(s)
NOAA-19 / AVHRR, AQUA / AMSRE, GCOM-W1 / AMSR2, Suomi NPP / VIIRS, NOAA-20 / VIIRS, Sentinel-3 A / SLSTR, Sentinel-3 B / SLSTR, METOP-B / AVHRR, MSG-4 / SEVIRI

Temporal
Temporal properties 01-01-2018 → now
Resolution 1 day(s)

Spatial
Geographic area East Atlantic
Resolution 0.02 degree
Projection WGS 84 (EPSG:4326) - Equirectangular projection

CONTACT(S)

Help desk cersat@ifremer.fr
Originator Ifremer / CERSAT
Distributor Ifremer / CERSAT

GHRSST Dataset String Table

Unique Data Set String	Product Version	Numeric Code	Description
RAMSSA_09km-ABOM-L4-AUS-v01*	1	1	ABOM Australian Regional SST GDS 2.0 analysis product
GAMSSA_28km-ABOM-L4-GLOB-v01*	1	2	ABOM Global SST GDS 2.0 analysis product
EUR-L2P-AMSRE*	1	3	European regional subset L2P of REMSS AMSERE products.
REMSS-L2P-AMSRE*	1	4	L2P orbital AMSRE data from Remote Sensing Systems
REMSS-L2P_GRIDDED_25-AMSRE*	1	5	Gridded L2P AMSRE data from Remote Sensing Systems
EUR-L2P-ATS_NR_2P*	1	6	ENVISAT AATSR 1km SST product from European RDAC (EUR)
UPA-L2P-ATS_NR_2P*	1	7	ENVISAT AATSR 1km SST product from UPA
EUR-L2P-AVHRR16_G*	1	8	AVHRR NOAA-16 GAC products from EUR
EUR-L2P-AVHRR16_L*	1	9	AVHRR NOAA-16 LAC product from EUR
EUR-L2P-AVHRR17_G*	1	10	AVHRR NOAA-17 GAC product from EUR
NAVO-L2P-AVHRR17_G*	1	11	AVHRR NOAA-17 GAC product from NAVOCEANO
EUR-L2P-AVHRR17_L*	1	12	AVHRR NOAA-17 LAC L2P product from EUR
NAVO-L2P-AVHRR17_L*	1	13	AVHRR NOAA-17 LAC product from NAVOCEANO
NEODAAS-L2P-AVHRR17_L*	1	14	AVHRR NOAA-17 LAC product from NEODAAS
NAVO-L2P-AVHRR18_G*	1	15	AVHRR NOAA-18 GAC product from NAVOCEANO
NAVO-L2P-AVHRR17_L*	1	16	AVHRR NOAA-18 LAC product from NAVOCEANO
NEODAAS-L2P-AVHRR18_L*	1	17	AVHRR NOAA-18 LAC product from NEODAAS
NAVO-L2P-AVHRRMTA_G*	1	18	METOP-A AVHRR L2P GAC data from NAVOCEANO
DMI-L4UHfnd-NSEABALTIC-DMI_OI*	1	19	L4 Ulta-high resolution Foundation SST analysis for the North Sea – Baltic region from DMI
EUR-L4HRfnd-GLOB-ODYSSEA*	1	20	ODYSSEA-based high resolution global analysis from the EUR RDAC
EUR-L4UHfnd-GAL-ODYSSEA*	1	21	ODYSSEA-based ultra high resolution Galapagos regional analysis from the EUR RDAC

Should be replaced now with GHRSST Central Catalogue Entry

GHRSST Central Catalogue : editing workflow

- One contact point per GDP or DAC
- Each GDP responsible for editing and updating its own dataset (can be delegated to DAC)
- Each DAC responsible for editing the access information (can be the same as GDP):
  - URLs for FTP, HTTP, OpenDAP, etc… accesses
  - Opensearch end-point (when existing) and product identifier
- Request account for catalogue editing at: chb@dmi.dk
  - Receive login and password for editing
  - Receive instructions (User Manual) for editing
- Connect to https://www.ghrsst.org/ghrsst-data-services/ghrsst-catalogue
- Sign in with account
- New form or duplicate existing dataset / edit
- DOI can be requested online (but you can provide your own)
- When editing a new dataset, send to review board once the form is completed
- When updating an existing dataset, review and approval is not required

Federated Opensearch service

- Currently: https://opensearx.ifremer.fr/
- Connected to OSI SAF (at Ifremer) and PO.DAAC end points
- Opensearch configuration is connected to the GHRSST catalogue : it is important to keep the catalogue metadata accurate and up-to-date
- Subject to changes in July (testing phase) as we are refining the initial GHRSST Central Catalogue
- Example notebook on GHRSST Github: https://github.com/GHRSST/ghrsst-opensearch/blob/main/opensearx.ipynb

Responsibilities of GHRSST Data Producers

GHRSST data producers are responsible for:

- The compliance of their products to GHRSST GDS specifications. Run the format checker and provided result to GPO for publication in catalogue.
- Creating, editing and keeping up to date the description of the datasets they produce for GHRSST.

Current list of GDPs: see previous table

Responsibilities of GHRSST Data Assembly Centers

GHRSST data assembly centres (DACs) are responsible for:

- Creating, editing and keeping up to date the description of the data access services they offer for the datasets they host and distribute for GHRSST.
- Providing HTTP(S), FTP, OpenDAP etc access
- Providing Opensearch end-point to be plugged to GHRSST Opensearch entry point

Current list of DACs: see previous table

GHRSST Project Office Responsibilities

The GHRSST Project Office, together with the support of the Science Team technical task team, should be responsible for:

- Implementing, operating and sustaining the central catalogue and its search and discovery services (on whatever host) – currently funded by Copernicus.
- Verifying the compliance of provided dataset and metadata. Approving the publication of any submitted dataset
  - Verification of metadata accuracy and completeness
  - Verify result of format checker
  - Proposition: support of R/G TS core team - rotating chair

Proposed Schedule for completion of activities

- Schedule and date for completion of Task Team activities:
  - For GHRSST Centrale Catalogue
    - Last harvesting of metadata from PO.DAAC catalogue: **end July 2022 – import will be then not possible.**
    - Initial internal version (pre-populated, not public): **end July 2022**
    - Correction/update of pre-populated information (R/G TS testing team: Ifremer, PO.DAAC, NOAA, EUMETSAT): **end July to end October 2022**
    - Release to public (with approved datasets): **mid September 2022**
    - All DACs and GDPs able to edit datasets, add new datasets, etc…: **mid September 2022**
- Justification for extension beyond completion date:
  - Continous effort; more DACs and GDPs to fulfill required service

Work plan for next year

2022 (second half)

To complete initial population of catalogue – update outdated information

To open to public GHRSST central catalogue and Opensearch services

To complete the GHRSST central catalogue with missing and new products

Federated granule search service for datasets with Opensearch end-point

2023 (first half)

To operate the GHRSST R/G TS system : verification of new datasets and metadata

To verify and support the implementation of the required GHRSST services by each DAC, in particular opensearch

WEB: http://www.ghrsst.org

@ghrsst

https://www.ghrsst.org/outreach/newsletter/

Committee on Earth Observation Satellites Sea Surface Temperature Virtual Constellation