PRODUCT USER MANUAL

Global Ocean Reanalysis Product

GLOBAL-MULTIYEAR-PHY-ENS-001-031
Issue: 1.2

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RECORD TABLE

Issue	Date	§	Description of Change	Author	Validated By
1.0	21/01/2019	all	Creation of the document	A.Gounou	C. Derval
1.1	02/12/2019	All	Dataset names update	A. Gounou	C. Derval
1.1	22/06/2020	V.I	Example of file header	A Gounou	C. Derval
1.1	22/11/2022	all	New template	A Biardeau	Copernicus Marine Service Management
1.1	09/01/2023	II.C	Correction table Production System Description	R. Bourdallé-Badie	Copernicus Marine Service Management
1.2	16/06/2023	all	Change product name Add new ice variables	R. Bourdallé-Badie	Copernicus Marine Service Management

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GLOSSARY AND ABBREVIATIONS

CMEMS	Copernicus Monitoring Environment Marine Service
MFC	Monitoring and Forecasting Centre
Med	Mediterranean
NetCDF	Network Common Data Form
CF	Climate Forecast (convention for NetCDF)
SSS	Sea surface salinity.
SSC	Sea surface currents
SSH	Sea surface height
RMS	Root mean square
SDN	SeaDataNet (climatology)
CHL	Chlorophyll
SLA	Sea Level Anomalies
PC	Production Center
PU	Production Unit
Meridional Velocity	West to East component of the horizontal velocity vector
Zonal Velocity	South to North component of the horizontal velocity vector

DATA ACCESS

After registration, you will be able to download our data. To assist you, our HelpCenter is available, and more specifically its section about download.

Information on operational issues on products and services can be found on our User Notification Service. If you have any questions, please contact us.

1) INTRODUCTION

a) Summary

This document describes the global ocean reanalysis produced by the Copernicus Marine Service Global Monitoring and Forecasting Centre, the data services that are available to access them and how to use the files and services.
The products assessed in this document are referenced as:
GLOBAL-MULTIYEAR-PHY-ENS-001-031 for Global Reanalysis Multi-Model Ensemble Product GREP.

Global ocean reanalyses are homogeneous 3D gridded descriptions of the physical state of the ocean spanning several decades, produced with a numerical ocean model constrained with data assimilation of satellite and in situ observations. The multi-model ensemble approach allows uncertainties or error bars in the ocean state to be estimated. The ensemble mean may even provide, for certain regions and/or periods, a more reliable estimate than any individual reanalysis product.

Three reanalyses start on 1993 during which altimeter altimetry data observations are available; GLORYS2V4 from Mercator Ocean (Fr), ORAS5 from ECMWF and C-GLORS05 from CMCC (It) provided three different time series of global ocean simulations **3D daily estimates**, which were post-processed to create the new product called GREP (Global Reanalysis Ensemble Product), and for which the following variables are available:

* sea_water_potential_temperature
* sea_water_salinity
* eastward_sea_water_velocity
* northward_sea_water_velocity
* sea_surface_height
* ocean_mixed_layer_thickness
* sea_ice_thickness
* sea_ice_area_fraction

These reanalyses are built to be as close as possible to the observations (i.e. realistic) and in agreement with the model physics. It covers the "altimetric era" since 1st of January 1993. The numerical products available for users are monthly mean averages describing the ocean from surface to bottom (5900 m).

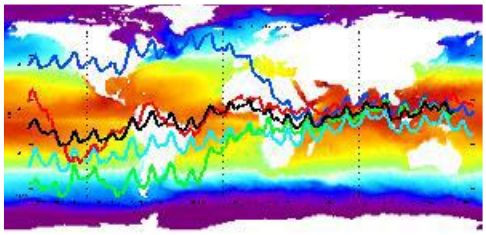
The table below synthesizes the data set of the global ocean physical reanalysis product:

Product Name	Product origin	Production Unit	Data set	Kind of data set
GLOBAL-MULTIYEAR-PHY-ENS-001-031	**CGLORS, ORAS5, GLORYS2V4**	**GLO-MERCATOR-TOULOUSE-FR**	cmems_mod_glo_phy-all_my_0.25deg_P1D-m	reanalysis variables: temperature, salinity, velocities, sea surface height, ocean mixed layer thickness, sea ice thickness, sea ice area fraction
			cmems_mod_glo_phy-mnstd_my_0.25deg_P1D-m	reanalysis variables: temperature, salinity, velocities, sea surface height, ocean mixed layer thickness, sea ice thickness, sea ice area fraction
			cmems_mod_glo_phy-all_my_0.25deg_P1M-m	reanalysis variables: temperature, salinity, velocities, sea surface height, ocean mixed layer thickness, sea ice thickness, sea ice area fraction
			cmems_mod_glo_phy-mnstd_my_0.25deg_P1M-m	reanalysis variables: temperature, salinity, velocities, sea surface height, ocean mixed layer thickness, sea ice thickness, sea ice area fraction

2) DESCRIPTION OF THE PRODUCT SPECIFICATION

a) General Information

The main features of the global reanalysis product are summarized in the table below:

Product line	GLOBAL-REANALYSIS-PHY-001-031
Geographical coverage	-180°E □ 180°E ; 89°S □ 90°N
Variables	Temperature, Salinity, Eastward velocity, Northward velocity, sea surface height, ocean mixed layer depth
Reanalysis	**GLOBAL-MULTIYEAR-PHY-ENS-001-031**
Available time series	From January 1993 and regularly updated (see product improvements pages http://marine.copernicus.eu/services-portfolio/product-improvements/)
Temporal resolution	3D daily average fields
Target delivery time	n.a.
Delivery mechanism	Marine Data Store
Horizontal resolution **Grid size** **Projection**	Regular 0.25° grid 1440*681  **Regular projection is plane chart** - Longitude and latitude step is constant - Longitude step is equal to latitude step - Longitude and latitude coordinates are 1D array 

Number of vertical levels	The vertical grid consists of **75 levels**: the thickness of the surface layer is about 1 meter, is close to 10 m at 100 m depth and increases up to 200 meters at the bottom (near 6000m): 0.50, 1.55, 2.66, 3.85, 5.14, 6.54, 8.09, 9.82, 11.77, 13.99, 16.52, 19.42, 22.75, 26.55, 30.87, 35.74, 41.18, 47.21, 53.85, 61.11, 69.02, 77.61, 86.92, 97.04, 108.0, 120.00, 133.07, 147.40, 163.16, 180.54, 199.79, 221.14, 244.89, 271.35, 300.88, 333.86, 370.68, 411.79, 457.62, 508.63, 565.29, 628.02, 697.25, 773.36, 856.67, 947.44, 1045.85, 1151.99, 1265.86, 1387.37, 1516.36, 1652.56, 1795.67, 1945.29, 2101.02, 2262.42, 2429.02, 2600.38, 2776.03, 2955.57, 3138.56, 3324.64, 3513.44, 3704.65, 3897.98, 4093.15, 4289.95, 4488.15, 4687.58, 4888.07, 5089.47, 5291.68, 5494.57, 5698.06, 5902.05
Assimilated observations	altimetric sea level anomaly, temperature and salinity in situ profiles, sea-surface temperature observations, sea ice concentration
Format	Netcdf CF1.6

GLOBAL-MULTIYEAR-PHYS-ENS-001-031 product

b) Production System Description

1. *GLOBAL_MULTIYEAR_PHY_ENS_001_031*

Global ocean reanalyses are homogeneous 3D gridded descriptions of the physical state of the ocean spanning several decades, produced with a numerical ocean model constrained with data assimilation of satellite and in situ observations. The three reanalyses used here are based on the NEMO model, on the ORCA025 grid (1/4° horizontal resolution), with 75 vertical levels, all are forced at the surface by ERA interim, and all assimilate sea surface temperature SST, sea level anomalies SLA, sea ice concentrations SIC and in situ temperature and salinity profiles T/S (z) The main differences in between the four individual products are summarized in the table below.

The reader will find more detailed descriptions in the following documents:
- GLORYS2V4: QUID document (see in **REFERENCES**), and description of Mercator Ocean's ocean analysis system: Lellouche et al (2013)
- C-GLORS: Storto et al (2016)
- ORAS5: Zuo et al (2017), is an upgrade of ORAP5 (Zuo et al 2015)

Reanalysis	Production centre	COMMON	Model version	Surface Forcing	ASSIMILATION
GLORYS2V4	Mercator Océan	**NEMO**, **ORCA1/4° 75 vertical** levels TKE Altimetry ERA : **1993-2015 ERAinterim** and bulk formulae Observations : **SST, SLA, T/S profiles, SIC** Multivariate assimilation, monovariate for the SIC	NEMO3.1 LIM2	**No surface nudging** precipitation, flux correction Climatological **runoff** + ice shelf and iceberg melting	**SAM2 (SEEK)** Large scale bias correction **7-day** assimilation window Merge MDT (obs+model) Reynolds SST, CORA
C-GLORS	CMCC		NEMO3.4 LIM2	SST, SSS, SIC surface nudging	**OceanVar (3Dvar)** Large scale bias correction **7-day** assimilation window Model MDT Reynolds SST, EN4
ORAS5	ECMWF		NEMO3.4.1 LIM2	**Surface waves** SST, SSS surface nudging	**NEMOVAR (3Dvar)** **5-day** assimilation window HadISSTv2 SST, EN4

Synthetic view of the four reanalyses subsystems components

For all the bibliographic references cited in text, refer to the Quid document (see in **REFERENCES).**

c) Details of datasets

GLOBAL_MULTIYEAR_PHY_ENS_001_031	
DATASETS 3D monthly average fields	Variables name in the NetCDF file and Unit Long_name Standard_name
cmems_mod_glo_phy-all_my_0.25deg_P1D-m -	**thetao_cglo [degC]** C-GLORS Potential Temperature sea_water_potential_temperature **thetao_glor [degC]** GLORYS2V4 Potential Temperature sea_water_potential_temperature **thetao_oras[degC]** ORAS5 Potential Temperature sea_water_potential_temperature **so_cglo [PSU]** C-GLORS Salinity sea_water_salinity **so_glor [PSU]** GLORYS2V4 Salinity sea_water_salinity **so_oras [PSU]** ORAS5 Salinity sea_water_salinity **u0_cglo [m.s-1]** C-GLORS Eastward Velocity eastward_sea_water_velocity **uo_glor [m.s-1]** GLORYS2V4 Eastward Velocity eastward_sea_water_velocity **uo_oras [m.s-1]** ORAS5 Eastward Velocity eastward_sea_water_velocity **vo_cglo [m.s-1]** C-GLORS Northward Velocity northward_sea_water_velocity **vo_glor [m.s-1]** GLORYS2V4 Northward Velocity northward_sea_water_velocity **vo_oras [m.s-1]** ORAS5 Northward Velocity northward_sea_water_velocity **zos_cglo[m]** C-GLORS seas surface height sea_surface_height_above_geoid **zos_glor[m]** GLORYS2V4 seas surface height sea_surface_height_above_geoid **zos_oras[m]** ORAS5 seas surface height sea_surface_height_above_geoid **mlotst_cglo[m]** C-GLORS ocean mixed layer

	ocean_mixed_layer_thickness_defined_by_sigma_theta **mlotst_glor[m]** GLORYS2V4 ocean mixed layer ocean_mixed_layer_thickness_defined_by_sigma_theta **mlotst_oras[m]** ORAS5 ocean mixed layer ocean_mixed_layer_thickness_defined_by_sigma_theta **siconc_cglo [%]** C-GLORS sea_ice_area_fraction sea_ice_area_fraction **siconc_glor [%]** GLORYS2V4 sea_ice_area_fraction sea_ice_area_fraction **siconc_oras [%]** ORAS5 sea_ice_area_fraction sea_ice_area_fraction **sithick_cglo [%]** C-GLORS Sea ice thickness Sea ice thickness **sithick_glo [%]** GLORYS2V4 Sea ice thickness Sea ice thickness **sithick_oras [%]** ORAS5 Sea ice thickness Sea ice thickness
cmems_mod_glo_phy-mnstd_my_0.25deg_P1D-m	**thetao_mean [degC]** Mean of Input Analyses Potential Temperatures sea_water_potential_temperature **thetao_std [degC]** Standard Deviation of Input Analyses Potential Temperatures sea_water_potential_temperature **so_mean [PSU]** Mean of Input Analyses Salinities sea_water_salinity **so_std[PSU]** Standard Deviation of Input Analyses Salinities sea_water_salinity **uo_mean [m.s-1]** Mean of Input Analyses Eastward Velocities eastward_sea_water_velocity **uo_std [m.s-1]** Standard Deviation of Input Analyses Eastward Velocities eastward_sea_water_velocity **vo_mean [m.s-1]** Mean of Input Analyses Northward Velocities northward_sea_water_velocity **vo_std [m.s-1]** Standard Deviation of Input Analyses Northward Velocities northward_sea_water_velocity **zos_mean[m]** Mean of Input Analyses seas surface height sea_surface_height_above_geoid

	zos_std[m] Standard Deviation of Input Analyses seas surface height sea_surface_height_above_geoid **mlotst_mean[m]** Mean of Input Analyses ocean mixed layer ocean_mixed_layer_thickness_defined_by_sigma_theta **mlotst_std[m]** Standard Deviation of Input Analyses ocean mixed layer ocean_mixed_layer_thickness_defined_by_sigma_theta **siconc_mean[%]** Mean of sea_ice_area_fraction sea_ice_area_fraction **siconc_std[%]** Standard Deviation of sea_ice_area_fraction sea_ice_area_fraction **sithick_mean[%]** Mean of Sea ice thickness Sea ice thickness **sithick_std[%]** Standard Deviation of Sea ice thickness Sea ice thickness
cmems_mod_glo_phy-all_my_0.25deg_P1M-m	**thetao_cglo [degC]** C-GLORS Potential Temperature sea_water_potential_temperature **thetao_glor [degC]** GLORYS2V4 Potential Temperature sea_water_potential_temperature **thetao_oras[degC]** ORAS5 Potential Temperature sea_water_potential_temperature **so_cglo [PSU]** C-GLORS Salinity sea_water_salinity **so_glor [PSU]** GLORYS2V4 Salinity sea_water_salinity **so_oras [PSU]** ORAS5 Salinity sea_water_salinity **u0_cglo [m.s-1]** C-GLORS Eastward Velocity eastward_sea_water_velocity **uo_glor [m.s-1]** GLORYS2V4 Eastward Velocity eastward_sea_water_velocity **uo_oras [m.s-1]** ORAS5 Eastward Velocity eastward_sea_water_velocity **vo_cglo [m.s-1]** C-GLORS Northward Velocity northward_sea_water_velocity **vo_glor [m.s-1]** GLORYS2V4 Northward Velocity

	northward_sea_water_velocity **vo_oras [m.s-1]** ORAS5 Northward Velocity northward_sea_water_velocity **zos_cglo[m]** C-GLORS seas surface height sea_surface_height_above_geoid **zos_glor[m]** GLORYS2V4 seas surface height sea_surface_height_above_geoid **zos_oras[m]** ORAS5 seas surface height sea_surface_height_above_geoid **mlotst_cglo[m]** C-GLORS ocean mixed layer ocean_mixed_layer_thickness_defined_by_sigma_theta **mlotst_glor[m]** GLORYS2V4 ocean mixed layer ocean_mixed_layer_thickness_defined_by_sigma_theta **mlotst_oras[m]** ORAS5 ocean mixed layer ocean_mixed_layer_thickness_defined_by_sigma_theta **siconc_cglo [%]** C-GLORS sea_ice_area_fraction sea_ice_area_fraction **siconc_glor [%]** GLORYS2V4 sea_ice_area_fraction sea_ice_area_fraction **siconc_oras [%]** ORAS5 sea_ice_area_fraction sea_ice_area_fraction **sithick_cglo [%]** C-GLORS Sea ice thickness Sea ice thickness **sithick_glo [%]** GLORYS2V4 Sea ice thickness Sea ice thickness **sithick_oras [%]** ORAS5 Sea ice thickness Sea ice thickness
cmems_mod_glo_phy-mnstd_my_0.25deg_P1M-m	**thetao_mean [degC]** Mean of Input Analyses Potential Temperatures sea_water_potential_temperature **thetao_std [degC]** Standard Deviation of Input Analyses Potential Temperatures sea_water_potential_temperature **so_mean [PSU]** Mean of Input Analyses Salinities sea_water_salinity **so_std[PSU]** Standard Deviation of Input Analyses Salinities sea_water_salinity

	uo_mean [m.s-1] Mean of Input Analyses Eastward Velocities eastward_sea_water_velocity **uo_std [m.s-1]** Standard Deviation of Input Analyses Eastward Velocities eastward_sea_water_velocity **vo_mean [m.s-1]** Mean of Input Analyses Northward Velocities northward_sea_water_velocity **vo_std [m.s-1]** Standard Deviation of Input Analyses Northward Velocities northward_sea_water_velocity **zos_mean[m]** Mean of Input Analyses seas surface height sea_surface_height_above_geoid **zos_std[m]** Standard Deviation of Input Analyses seas surface height sea_surface_height_above_geoid **mlotst_mean[m]** Mean of Input Analyses ocean mixed layer ocean_mixed_layer_thickness_defined_by_sigma_theta **mlotst_std[m]** Standard Deviatin of Input Analyses ocean mixed layer ocean_mixed_layer_thickness_defined_by_sigma_theta **siconc_mean[%]** Mean of sea_ice_area_fraction sea_ice_area_fraction **siconc_std[%]** Standard Deviation of sea_ice_area_fraction sea_ice_area_fraction **sithick_mean[%]** Mean of Sea ice thickness Sea ice thickness **sithick_std[%]** Standard Deviation of Sea ice thickness Sea ice thickness

d) Additional Information on parameters

mlotst [m]	ocean_mixed_layer_thickness_defined_by_sigma_theta. It is the depth where the density increase compared to density at 10 m depth corresponds to a temperature decrease of 0.2°C in local surface conditions (θ10m, S10m, P0= 0 db, surface pressure)
zos [m]	sea_surface_height_above_geoid. The geoid is a surface of constant geopotential with which mean sea level would coincide if the ocean were at rest. The parameter "zos" is the difference between the actual sea surface height at any given time and place, and that which it would have if the ocean were at rest.

Find more information about Sea Surface Height in this article:
What are the differences between the SSH and SLA? | Copernicus Marine Help Center

3) FILE FORMAT

The products are stored using the NetCDF format.

To know more about the NetCDF format, please follow this link:
What is the format of Copernicus Marine products ? NetCDF

To understand the differences between netCDF and Zarr, please consult this article:
how-to-choose-between-netcdf-and-zarr-format-using-the-toolbox

4) FILES NOMENCLATURE

Information about nomenclature of files when downloaded can be found in this articles " **How is defined the nomenclature of Copernicus Marine data? | Copernicus Marine Help Center***"*

a) Nomenclature of files when downloaded through I Subset Service

The scheme is:
datasetname-nnnnnnnnnnnnn.nc
where :
.datasetname is a character string within one of the dataset from Table2.
. nnnnnnnnnnnnn: 13 digit integer linked to the request date.
.nc: standard NetCDF filename extension.

Example:
cmems_mod_glo_phy-all_my_0.25deg_P1D-m-1453914297200.nc

b) Nomenclature of original files

These two nomenclatures are described below **with an example for GLOBAL_MULTIYEAR_PHY_ENS_001_031** :

- Daily datasets

  cmems_mod_glo_phy-{type}_0.25deg_P1D-m_{*yyyymmdd*.nc

- Monthly datasets

  Cmems_mod_glo_phy-{type}_my_0.25deg_P1D-m_{*yyyymm*}.nc

  Where:

- yyyymmdd and yyyymm: daily and monthly mean field dates
- type : the dataset type
-
- **.nc**: standard NetCDF filename extension.

c) Other information: land mask value, compression

The product is daily mean fields and is only available as monthly mean fields.

d) Structure of files

See in ANNEX.

5) REFERENCES

Quality Information Document (QUID) :
https://catalogue.marine.copernicus.eu/documents/QUID/CMEMS-GLO-QUID-001-031.pdf

ANNEX

```
ncdump -h grepv2_daily_20181201.nc
netcdf grepv2_daily_20181201 {
dimensions:
        longitude = 1440 ;
        latitude = 681 ;
        depth = 75 ;
        time = UNLIMITED ; // (1 currently)
variables:
        float longitude(longitude) ;
                longitude:valid_min = -180.f ;
                longitude:valid_max = 179.75f ;
                longitude:step = 0.25f ;
                longitude:units = "degrees_east" ;
                longitude:unit_long = "Degrees East" ;
                longitude:long_name = "Longitude" ;
                longitude:standard_name = "longitude" ;
                longitude:axis = "X" ;
        float latitude(latitude) ;
                latitude:valid_min = -80.f ;
                latitude:valid_max = 90.f ;
                latitude:step = 0.25f ;
                latitude:units = "degrees_north" ;
                latitude:unit_long = "Degrees North" ;
                latitude:long_name = "Latitude" ;
                latitude:standard_name = "latitude" ;
                latitude:axis = "Y" ;
        float depth(depth) ;
                depth:valid_min = 0.50576f ;
                depth:valid_max = 5902.058f ;
                depth:units = "m" ;
                depth:positive = "down" ;
                depth:unit_long = "Meters" ;
                depth:long_name = "Depth" ;
                depth:standard_name = "depth" ;
                depth:axis = "Z" ;
        float time(time) ;
                time:axis = "T" ;
                time:long_name = "Time" ;
                time:standard_name = "time" ;
                time:calendar = "gregorian" ;
                time:units = "days since 1950-01-01 00:00:00" ;
        float thetao_cglo(time, depth, latitude, longitude) ;
                thetao_cglo:long_name = "Temperature" ;
                thetao_cglo:standard_name = "sea_water_potential_temperature" ;
                thetao_cglo:units = "degrees_C" ;
                thetao_cglo:unit_long = "Degrees Celsius" ;
```

thetao_cglo:_FillValue = 9.96921e+36f ;
thetao_cglo:add_offset = 0.f ;
thetao_cglo:scale_factor = 1.f ;
thetao_cglo:valid_min = -3.397529f ;
thetao_cglo:valid_max = 33.59927f ;
thetao_cglo:cell_methods = "area: mean" ;
float so_cglo(time, depth, latitude, longitude) ;
so_cglo:long_name = "Salinity" ;
so_cglo:standard_name = "sea_water_salinity" ;
so_cglo:units = "1e-3" ;
so_cglo:unit_long = "Practical Salinity Unit" ;
so_cglo:_FillValue = 9.96921e+36f ;
so_cglo:add_offset = 0.f ;
so_cglo:scale_factor = 1.f ;
so_cglo:valid_min = 1.439236f ;
so_cglo:valid_max = 42.48916f ;
so_cglo:cell_methods = "area: mean" ;
float uo_cglo(time, depth, latitude, longitude) ;
uo_cglo:long_name = "Eastward velocity" ;
uo_cglo:standard_name = "eastward_sea_water_velocity" ;
uo_cglo:units = "m s-1" ;
uo_cglo:unit_long = "Meters per second" ;
uo_cglo:_FillValue = 9.96921e+36f ;
uo_cglo:add_offset = 0.f ;
uo_cglo:scale_factor = 1.f ;
uo_cglo:valid_min = -1.608764f ;
uo_cglo:valid_max = 1.550244f ;
uo_cglo:cell_methods = "area: mean" ;
float vo_cglo(time, depth, latitude, longitude) ;
vo_cglo:long_name = "Northward velocity" ;
vo_cglo:standard_name = "northward_sea_water_velocity" ;
vo_cglo:units = "m s-1" ;
vo_cglo:unit_long = "Meters per second" ;
vo_cglo:_FillValue = 9.96921e+36f ;
vo_cglo:add_offset = 0.f ;
vo_cglo:scale_factor = 1.f ;
vo_cglo:valid_min = -1.721899f ;
vo_cglo:valid_max = 1.67572f ;
vo_cglo:cell_methods = "area: mean" ;
float zos_cglo(time, latitude, longitude) ;
zos_cglo:long_name = "Sea surface height" ;
zos_cglo:standard_name = "sea_surface_height_above_geoid" ;
zos_cglo:units = "m" ;
zos_cglo:unit_long = "Meters" ;
zos_cglo:add_offset = 0.f ;
zos_cglo:scale_factor = 1.f ;
zos_cglo:_FillValue = 9.96921e+36f ;
zos_cglo:valid_min = -1.918399f ;
zos_cglo:valid_max = 1.672392f ;

zos_cglo:cell_methods = "area: mean" ;
float mlotst_cglo(time, latitude, longitude) ;
mlotst_cglo:long_name = "Density ocean mixed layer thickness" ;
mlotst_cglo:standard_name =
"ocean_mixed_layer_thickness_defined_by_sigma_theta" ;
mlotst_cglo:units = "m" ;
mlotst_cglo:unit_long = "Meters" ;
mlotst_cglo:add_offset = 0.f ;
mlotst_cglo:scale_factor = 1.f ;
mlotst_cglo:_FillValue = 9.96921e+36f ;
mlotst_cglo:valid_min = -21.21623f ;
mlotst_cglo:valid_max = 894.7832f ;
mlotst_cglo:cell_methods = "area: mean" ;
float siconc_cglo(time, latitude, longitude) ;
siconc_cglo:long_name = "Ice concentration" ;
siconc_cglo:standard_name = "sea_ice_area_fraction" ;
siconc_cglo:units = "1" ;
siconc_cglo:unit_long = "Fraction" ;
siconc_cglo:add_offset = -3.81481368094683e-05 ;
siconc_cglo:scale_factor = 3.81481368094683e-05 ;
siconc_cglo:_FillValue = -32767s ;
siconc_cglo:valid_min = 1s ;
siconc_cglo:valid_max = 27313s ;
siconc_cglo:cell_methods = "area: mean where sea_ice" ;
float sithick_cglo (time, latitude, longitude) ;
sithick_cglo:long_name = "Sea ice thickness" ;
sithick_cglo:standard_name = "sea_ice_thickness" ;
sithick_cglo:units = "m" ;
sithick_cglo:unit_long = "Meters" ;
sithick_cglo:add_offset = -0.000762962736189365 ;
sithick_cglo:scale_factor = 0.000762962736189365 ;
sithick_cglo:_FillValue = -32767s ;
sithick_cglo:valid_min = 1s ;
sithick_cglo:valid_max = 5945s ;
sithick_cglo:cell_methods = "area: mean where sea_ice" ;
float thetao_glor(time, depth, latitude, longitude) ;
thetao_glor:long_name = "Temperature" ;
thetao_glor:standard_name = "sea_water_potential_temperature" ;
thetao_glor:units = "degrees_C" ;
thetao_glor:unit_long = "Degrees Celsius" ;
thetao_glor:_FillValue = 9.96921e+36f ;
thetao_glor:add_offset = 0.f ;
thetao_glor:scale_factor = 1.f ;
thetao_glor:valid_min = -4.707836f ;
thetao_glor:valid_max = 33.68146f ;
thetao_glor:cell_methods = "area: mean" ;
float so_glor(time, depth, latitude, longitude) ;
so_glor:long_name = "Salinity" ;
so_glor:standard_name = "sea_water_salinity" ;

so_glor:units = "1e-3" ;
so_glor:unit_long = "Practical Salinity Unit" ;
so_glor:_FillValue = 9.96921e+36f ;
so_glor:add_offset = 0.f ;
so_glor:scale_factor = 1.f ;
so_glor:valid_min = 0.002998352f ;
so_glor:valid_max = 41.962f ;
so_glor:cell_methods = "area: mean" ;
float uo_glor(time, depth, latitude, longitude) ;
uo_glor:long_name = "Eastward velocity" ;
uo_glor:standard_name = "eastward_sea_water_velocity" ;
uo_glor:units = "m s-1" ;
uo_glor:unit_long = "Meters per second" ;
uo_glor:_FillValue = 9.96921e+36f ;
uo_glor:add_offset = 0.f ;
uo_glor:scale_factor = 1.f ;
uo_glor:valid_min = -1.71077f ;
uo_glor:valid_max = 2.178272f ;
uo_glor:cell_methods = "area: mean" ;
float vo_glor(time, depth, latitude, longitude) ;
vo_glor:long_name = "Northward velocity" ;
vo_glor:standard_name = "northward_sea_water_velocity" ;
vo_glor:units = "m s-1" ;
vo_glor:unit_long = "Meters per second" ;
vo_glor:_FillValue = 9.96921e+36f ;
vo_glor:add_offset = 0.f ;
vo_glor:scale_factor = 1.f ;
vo_glor:valid_min = -1.811957f ;
vo_glor:valid_max = 2.335733f ;
vo_glor:cell_methods = "area: mean" ;
float zos_glor(time, latitude, longitude) ;
zos_glor:long_name = "Sea surface height" ;
zos_glor:standard_name = "sea_surface_height_above_geoid" ;
zos_glor:units = "m" ;
zos_glor:unit_long = "Meters" ;
zos_glor:add_offset = 0.f ;
zos_glor:scale_factor = 1.f ;
zos_glor:_FillValue = 9.96921e+36f ;
zos_glor:valid_min = -1.95654f ;
zos_glor:valid_max = 1.757171f ;
zos_glor:cell_methods = "area: mean" ;
float mlotst_glor(time, latitude, longitude) ;
mlotst_glor:long_name = "Density ocean mixed layer thickness" ;
mlotst_glor:standard_name =
"ocean_mixed_layer_thickness_defined_by_sigma_theta" ;
mlotst_glor:units = "m" ;
mlotst_glor:unit_long = "Meters" ;
mlotst_glor:add_offset = 0.f ;
mlotst_glor:scale_factor = 1.f ;

mlotst_glor:_FillValue = 9.96921e+36f ;
mlotst_glor:valid_min = -22.12102f ;
mlotst_glor:valid_max = 913.6866f ;
mlotst_glor:cell_methods = "area: mean" ;
float siconc_glor (time, latitude, longitude) ;
siconc_glor:long_name = "Ice concentration" ;
siconc_glor:standard_name = "sea_ice_area_fraction" ;
siconc_glor:units = "1" ;
siconc_glor:unit_long = "Fraction" ;
siconc_glor:add_offset = -3.81481368094683e-05 ;
siconc_glor:scale_factor = 3.81481368094683e-05 ;
siconc_glor:_FillValue = -32767s ;
siconc_glor:valid_min = 1s ;
siconc_glor:valid_max = 27313s ;
siconc_glor:cell_methods = "area: mean where sea_ice" ;
float sithick_glor (time, latitude, longitude) ;
sithick_glor:long_name = "Sea ice thickness" ;
sithick_glor:standard_name = "sea_ice_thickness" ;
sithick_glor:units = "m" ;
sithick_glor:unit_long = "Meters" ;
sithick_glor:add_offset = -0.000762962736189365 ;
sithick_glor:scale_factor = 0.000762962736189365 ;
sithick_glor:_FillValue = -32767s ;
sithick_glor:valid_min = 1s ;
sithick_glor:valid_max = 5945s ;
sithick_glor:cell_methods = "area: mean where sea_ice" ;
float thetao_oras(time, depth, latitude, longitude) ;
thetao_oras:long_name = "Temperature" ;
thetao_oras:standard_name = "sea_water_potential_temperature" ;
thetao_oras:units = "degrees_C" ;
thetao_oras:unit_long = "Degrees Celsius" ;
thetao_oras:_FillValue = 9.96921e+36f ;
thetao_oras:add_offset = 0.f ;
thetao_oras:scale_factor = 1.f ;
thetao_oras:valid_min = -2.220372f ;
thetao_oras:valid_max = 42.24278f ;
thetao_oras:cell_methods = "area: mean" ;
float so_oras(time, depth, latitude, longitude) ;
so_oras:long_name = "Salinity" ;
so_oras:standard_name = "sea_water_salinity" ;
so_oras:units = "1e-3" ;
so_oras:unit_long = "Practical Salinity Unit" ;
so_oras:_FillValue = 9.96921e+36f ;
so_oras:add_offset = 0.f ;
so_oras:scale_factor = 1.f ;
so_oras:valid_min = 0.01959857f ;
so_oras:valid_max = 41.79379f ;
so_oras:cell_methods = "area: mean" ;
float uo_oras(time, depth, latitude, longitude) ;

uo_oras:long_name = "Eastward velocity" ;
uo_oras:standard_name = "eastward_sea_water_velocity" ;
uo_oras:units = "m s-1" ;
uo_oras:unit_long = "Meters per second" ;
uo_oras:_FillValue = 9.96921e+36f ;
uo_oras:add_offset = 0.f ;
uo_oras:scale_factor = 1.f ;
uo_oras:valid_min = -1.531736f ;
uo_oras:valid_max = 1.94648f ;
uo_oras:cell_methods = "area: mean" ;
float vo_oras(time, depth, latitude, longitude) ;
vo_oras:long_name = "Northward velocity" ;
vo_oras:standard_name = "northward_sea_water_velocity" ;
vo_oras:units = "m s-1" ;
vo_oras:unit_long = "Meters per second" ;
vo_oras:_FillValue = 9.96921e+36f ;
vo_oras:add_offset = 0.f ;
vo_oras:scale_factor = 1.f ;
vo_oras:valid_min = -2.299931f ;
vo_oras:valid_max = 1.73963f ;
vo_oras:cell_methods = "area: mean" ;
float zos_oras(time, latitude, longitude) ;
zos_oras:long_name = "Sea surface height" ;
zos_oras:standard_name = "sea_surface_height_above_geoid" ;
zos_oras:units = "m" ;
zos_oras:unit_long = "Meters" ;
zos_oras:add_offset = 0.f ;
zos_oras:scale_factor = 1.f ;
zos_oras:_FillValue = 9.96921e+36f ;
zos_oras:valid_min = -2.036525f ;
zos_oras:valid_max = 1.444174f ;
zos_oras:cell_methods = "area: mean" ;
float mlotst_oras(time, latitude, longitude) ;
mlotst_oras:long_name = "Density ocean mixed layer thickness" ;
mlotst_oras:standard_name =
"ocean_mixed_layer_thickness_defined_by_sigma_theta" ;
mlotst_oras:units = "m" ;
mlotst_oras:unit_long = "Meters" ;
mlotst_oras:add_offset = 0.f ;
mlotst_oras:scale_factor = 1.f ;
mlotst_oras:_FillValue = 9.96921e+36f ;
mlotst_oras:valid_min = -8.293529f ;
mlotst_oras:valid_max = 1033.245f ;
mlotst_oras:cell_methods = "area: mean" ;
float siconc_oras (time, latitude, longitude) ;
siconc_oras:long_name = "Ice concentration" ;
siconc_oras:standard_name = "sea_ice_area_fraction" ;
siconc_oras:units = "1" ;
siconc_oras:unit_long = "Fraction" ;

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        siconc_oras:add_offset = -3.81481368094683e-05 ;
        siconc_oras:scale_factor = 3.81481368094683e-05 ;
        siconc_oras:_FillValue = -32767s ;
        siconc_oras:valid_min = 1s ;
        siconc_oras:valid_max = 27313s ;
        siconc_oras:cell_methods = "area: mean where sea_ice" ;
    float sithick_oras (time, latitude, longitude) ;
        sithick_oras:long_name = "Sea ice thickness" ;
        sithick_oras:standard_name = "sea_ice_thickness" ;
        sithick_oras:units = "m" ;
        sithick_oras:unit_long = "Meters" ;
        sithick_oras:add_offset = -0.000762962736189365 ;
        sithick_oras:scale_factor = 0.000762962736189365 ;
        sithick_oras:_FillValue = -32767s ;
        sithick_oras:valid_min = 1s ;
        sithick_oras:valid_max = 5945s ;
        sithick_oras:cell_methods = "area: mean where sea_ice" ;
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        :credit = "E.U. Copernicus Marine Service Information (CMEMS)" ;
        :contact = "servicedesk.cmems@mercator-ocean.eu" ;
        :references = "http://marine.copernicus.eu" ;
        :licence = "http://marine.copernicus.eu/services-portfolio/service-
commitments-and-licence/" ;
        :institution = "Mercator Ocean" ;
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        :source = "Copernicus Marine Service" ;
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