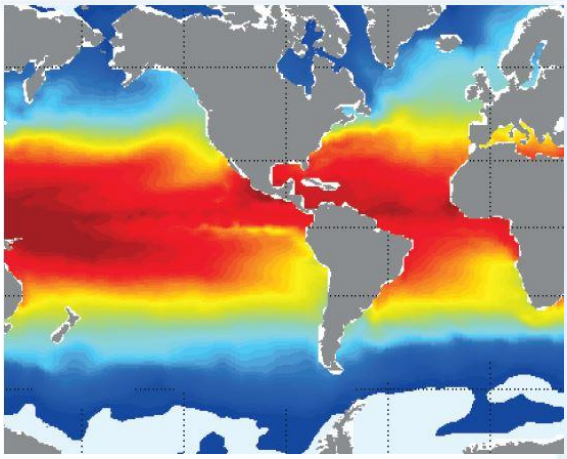
# NATIVE GRID PRODUCT - ANALYSIS AND FORECAST - GLOBAL OCEAN - PHY - 1/12°



This product contains analysis and forecast of the Global Ocean Physics at 1/12° (~9.3 km at the equator) – Temperature, Salinity, Sea Surface Height, Mixed layer Thickness, Currents, Sea Ice thickness, Concentration and drift - with a daily update of the latest ocean fields. The numerical files are displayed on the native grid 1/12°.

**Reference: GLO12V3R1**

| | | | |
|---|---|---|---|
| • Variables | PHY | Sea water salinity | psu |
| | | Sea water potential temperature | °C |
| | | Sea surface height above geoid | m |
| | | Sea water x velocity | m/s |
| | | Sea water y velocity | m/s |
| | | Mixed layer thickness sigma-theta | m |
| | | Sea water potential temperature at sea floor | °C |
| | ICE | Sea ice thickness | m |
| | | Sea ice fraction | [0;1] |
| | | Sea ice x velocity | m/s |
| | | Sea ice x velocity | m/s |
| • Geographical coverage | | Global Ocean (180°W-180°E; 77°S-90°N) | |
| • Grid and spatial horizontal resolution | | 1/12°~9.3km at the equator on ORCA025 Native Grid (ARAKAWA C, no interpolation) | |
| • Spatial vertical resolution | | 50 vertical levels (from -5500.0m to 0.0m) | |
| • Temporal resolution | | Daily-mean for 3D - hourly-mean for 2D and monthly-mean | |
| • Temporal coverage | | Analyses (27/12/2006) up to 10 day-forecast | |
| • Update frequency | | Daily update | |



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**Domain** : Global Ocean (180°W-180°E ; 77°S-90°N)
**Physic or Biogeochemistry** : Physic
**Code and Version** : Nemo3.1

**Grid and resolution** : ORCA12 [1/12°; 50 levels]
**Grid size** : 4322*3059 *50 (partial steps)
**Data Assimilation**: Yes **/ Tide** : No
**Sea Ice** : Sea Ice model LIM2 EVP
**Bathymetry**: ETOPO1 for the deep ocean and GEBCO8 close to the cost and slope.
**Time step** : 360s
**Update** : daily with 10-day forecast

| Reference GLO12V3R1 | |
|---|---|
| **Forcing and Data Assimilation** | |
| **Data assimilation** | Yes |
| **Data assimilation scheme** | SAM2 (SEEK Kernel)<br>+ IAU + 3D-Var bias correction (1 month time window) |
| **Data assimilated** | Sea Level - In-Situ TS Profiles – SST - Sea Ice Concentration and/or Thickness |
| **Atmospheric or Biogeochemical forcings:** | - Operational forcing : 3 hours from ECMWF<br>- Bulk formulation : CORE |
| **Runoff:**<br><br>**Open boundary conditions:** | Coastal runoffs and 100 major rivers from the Dai et al. (2009) database (instead of Dai and Tren berth (2002).<br>No |
| **Initial Conditions and Relaxation** | |
| **Initial Conditions** | Levitus (2009 T and S) for the ocean. Ifremer/Cersat data for ice concentration and GLORYS2V1 for ice thickness. |
| **Surface relaxation** | relaxation toward WOA 2013 at Gibraltar and Bab-el-Mandeb |
| **Water column (3D) relaxation** | No |
| **Convection** | By increasing vertical mixing |
| **Parametrisation** | |
| **Surface Physics parametrisation** | Free surface (explicit+filtering) |
| **Bottom friction** | No linear (constant bottom friction) |
| **Lateral friction** | Partial slip (shlat = 0.5) ; Mediterranean and Indonesia (shlat=2) and in Canadian straits and Cap Horn (shlat = 0) |
| **Vertical mixing** | Cf PSY4V3R1 ; weekly average of log10(kz) is performed |
| **Advection** | Turbulent closure model (order 1.5 and mixing length of 30m) adapted by Blanke and Delecluse (1993 |
| **Tracer diffusion** | Laplacian lateral isopycnal diffusion on tracers |
| **Momentum diffusion** | Horizontal biharmonic viscosity for momentum |
| **Horizontal diffusion coefficient for tracers and momentum** | aht0 = 80 m2/s<br>ahm0 = -1 1010 m2/s |
| **Vertical diffusion coefficient for tracers and momentum** | avt0 = 1. 10-5 m2/s<br>avm0 = 1. 10-4 m2/s |

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