



The Copernicus Marine global “blue” ocean reanalysis: past, present future

The Copernicus Marine Service is the marine component of the Earth Observation Copernicus program of the European Union. It provides free, regular and systematic authoritative information on the state of the Blue (physical), White (sea ice) and Green (biogeochemical) ocean, at global and regional scales. It is funded by the European Commission and implemented by Mercator Ocean International. In this context, Copernicus Marine proposes global ($1/12^\circ$ and $1/4^\circ$) blue and white ocean reanalysis (model/data combinations) covering the 3 last decades, among others reanalysis products. With more than 1.2 Peta octet downloaded and 5000 users in 2023 over last year, these reanalyzes are ones of the most more downloaded product of Copernicus Marine catalogue. This presentation, firstly, provides a description of 2 global blue reanalysis products distributed by Copernicus Marine: the $1/12^\circ$ (GLORYS12V1) targeting a robust representation of meso-scale activity and the multi product reanalysis at $1/4^\circ$ resolution (GREP) proposing a small multi-model ensemble approach. Then, an overall assessment of these 2 products is proposed, by inter-comparing them to each other and to observed data. This validation aims to highlight the level of performance in terms of temperature and salinity representation, transport estimates, trends and the reliability of the eddy-resolving physical reanalysis to represent meso-scale activity. In a third part, case studies and downstream applications done by users are presented. Finally, we describe the ongoing developments and first results of the next version of blue global reanalysis developed at Mercator-Ocean International (improvement of Global Mean Sea Level and mass/steric repartition, global trends, comparison to observed data).

R. Bourdallé-Badie¹, J.-M. Lellouche¹, E. Greiner², G. Garric¹, M. Drévillon¹, L. Parent¹, A. Melet¹, C. Regnier¹ ¹Mercator Ocean International, Toulouse, France ²CLS, Ramonville Saint Agne, France