High-resolution Climatology of the North-East Atlantic using Data-Interpolating Variational Analysis

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Numerous climatologies are available at different resolution and cover various part of the global ocean. Most of them have a resolution too low to represent suitably regional processes and are not able to not take into account the influence of physical effects (coast, boundaries, advection etc).

We developed a high-resolution atlas for temperature and salinity in the North-East part of the Atlantic Ocean on thirty-three depth levels. The originality of this climatology is twofold: (a) the data set: data were collected on all major databases and aggregated to lead to a dense data collection. (b) the method: climatological fields were constructed using Diva technique. The formulation allows the consideration of coastlines and bottom topography, and has a numerical cost independent on the number of observations. Moreover, only a few parameters are necessary in order to carry out an analysis. The method offers tools to determinate these parameters, making it as objective as possible and applicable to other regions.

Results show overall good agreement with World Ocean Atlas, but also reveal significant improvements in coastal areas. Error maps were generated according to different theories and emphasize the importance of data coverage for the creation of such climatological fields.

Diva own quality control allows the detection of suspect data not found by a priori quality checks and thus increase the overall quality of the climatology by removing unrealistic features.