



Monitoring the ocean from observations

S. Guinehut, M.-H. Rio, S. Mulet, A.-L. Dhomps, and G. Larnicol
CLS, Space Oceanography Division, Ramonville Saint-Agne, France

Producing comprehensive information about the ocean has become a top priority to monitor and predict the ocean and climate change. Complementary to modeling/assimilation approaches, an observation-based approach is proposed here. It relies on the combination of remote-sensing (altimetry and sea surface temperature) and in-situ (temperature and salinity profiles) observations through statistical methods.

The method uses first a multiple linear regression method to derive synthetic T/S profiles from the satellite measurements. These synthetic profiles are then combined with all available in-situ T/S profiles using an optimal interpolation method. The thermal wind equation with a reference level at the surface is finally used to combine current fields from satellite altimetry with the thermohaline fields to generate the global 3D current fields. Global temperature, salinity and current fields are thus available at a weekly period from the surface down to 1500-meter depth and a reanalysis is available for the 1993-2009 periods.

To assess the quality of this reanalysis, diagnostics from the common MyOcean WP4 validation protocol have been applied. In particular, we have compared our results to independent in-situ observations as the PIRATA/TAO/RAMA array. Also, a 1993-2010 long time series of the maximum Atlantic Meridional Overturning Circulation strength has been computed that shows good agreement with results from RAPID-MOCHA monitoring project and GLORYS Mercator-Ocean reanalysis. Finally, volume transports through various sections have been computed and compared to literature.