Geophysical Research Abstracts
Vol. 14, EGU2012-2657-1, 2012
EGU General Assembly 2012

Optimal spatio-temporal design of an hydrographic sampling aimed to monitor climate change in the Mediterranean Sea

J. Llasses, G. Jordà, and D. Gomis
IMEDEA (Universitat de les Illes Balears-CSIC), Mallorca, Spain (josep.llasses@uib.es)

Monitoring climate change is a priority for environmental management, since an early detection of climate change signals would allow more efficient adaptation strategies to future scenarios. Concerning the temperature and salinity of the Mediterranean Sea, there are two key factors that hinder climate change detection: the fact that climate change signals are still much smaller than the short-term natural variability of the fields and the paucity and non-homogeneous spatio-temporal distribution of the available temperature and salinity measurements Thus, after a detailed study of historical databases such as MEDATLAS, Jordà et al. (2012) have concluded that the number and distribution of observations in the Mediterranean Sea are insufficient to properly characterize temperature and salinity long-term trends at different depths. More specifically, they have showed that the intra-annual variability is poorly represented, the interannual variability has significant errors and trends are largely underestimated. In this study we evaluate the suitability of different distributions of observations in the Mediterranean Sea to identify temperature and salinity climate change signals.

The methodology bases on the extraction of temperature and salinity pseudo-observations from the outputs of a numerical model in order to simulate different observational designs. The pseudo-observations are then used to generate gridded products using Optimal Statistical Interpolation. Finally we compare those products with the original model data to get a quantitative estimate of their accuracy, particularly regarding the estimation of long-term trends. The pseudo-observations have been generated with the NEMOMED-8 model (spatial resolution of 1/8º) forced with the outputs of the ARPEGE atmospheric model (50km resolution) run under the A2 scenario Different data distributions are tested, including the present one, doubling the number of observations or making a regular sampling at different spatial resolutions. In the presentation we will show the capabilities and shortcomings of each observational distribution in terms of the detection of temperature, salinity and steric sea level trends at different spatial and temporal scales.