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# IBIRYS: a Regional High Resolution Reanalysis (physical and biogeochemical) over the European North East Shelf

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Mercator-Ocean has developed a regional forecasting system at 1/12° resolution over the North East Atlantic (IBI: Iberia, Biscay and Irish), taking advantage of the recent developments in NEMO. A reanalysis, called IBIRYS, was performed with the IBI system on the 2002-2012 period. The physical model was coupled on-line with the biogeochemical component of NEMO based on the PISCES model. The model was forced by ERA-interim products (every 3 hours) including the atmospheric pressure. In addition to atmospheric forcing, the model included astronomical tidal forcing. This regional forecasting system used boundary conditions from the Mercator-Ocean global reanalysis (GLORYS: GLobal Ocean ReanalYses and Simulations).The assimilation component SAM2 (Mercator Ocean assimilation system), was based on a reduced-order Kalman filter (the SEEK or Singular Extended Evolutive Kalman filter). An IAU method (Incremental Analysis Updates) was used to apply the increments in the system. The error statistics were represented in a sub-space spanned by a small number of dominant 3D error directions. A 3D-Var scheme corrected for the slowly evolving large-scale biases in temperature and salinity. The data assimilation system allowed to constrain the model in a multivariate way with Sea Surface Temperature (AVHRR + Multi-satellite High resolution), together with all available satellite Sea Level Anomalies, and with in situ observations from the CORA-03 data base, including ARGO floats temperature and salinity measurements.
In this presentation, the results obtained with IBIRYS are compared to GLORYS results. The consistency of the IBIRYS and GLORYS results at large scales is demonstrated. The capacity of IBIRYS to provide useful information at high frequencies in the North East Atlantic is shown. The biogeochemical results of IBIRYS are evaluated.