



Observing System Simulation Experiments in the Marmara Sea

Ali Aydog˘du (1,2,3), Tim Hoar (4), Tomislava Vukicevic (5), Jeffrey Anderson (4), Alicia Karspeck (4), Nadia Pinardi (6), Jonathan Hendricks (4), Nancy Collins (4), and Francesca Macchia (7)

(1) Science and Management of Climate Change, Ca' Foscari University of Venice, Italy, (2) Centro Euro-Mediterraneo sui Cambiamenti Climatici, Bologna, Italy, (3) Nansen Environmental and Remote Sensing Centre, Bergen, Norway, (4) National Center for Atmospheric Research, Boulder, Colorado, (5) Office of Water Prediction, National Weather Service NOAA, USA, (6) Department of Physics and Astronomy, University of Bologna, Italy, (7) Centro Euro-Mediterraneo sui Cambiamenti Climatici, Lecce, Italy

An observing system simulation experiment (OSSE) is presented in the Marmara Sea. A high resolution ocean circulation model (FESOM) and an ensemble data assimilation tool (DART) are coupled. The OSSE methodology is used to assess the possible impact of a ferrybox network in the eastern Marmara Sea. A reference experiment without assimilation is performed. Then, synthetic temperature and salinity observations are assimilated along the track of the ferries in the second experiment. The results suggest that a ferrybox network in the Marmara Sea may improve the analysis significantly. The salinity and temperature errors get smaller in the upper layer of the water column. The impact of the assimilation is negligible in the lower layer due to the strong stratification. The circulation in the Marmara Sea, particularly the Bosphorus outflow, helps to propagate the error reduction towards the western basin where no assimilation is performed. Overall, the proposed ferrybox network can be a good start to design an optimal sustained marine observing network in the Marmara Sea for assimilation purposes.