



Direct and indirect estimates of Mediterranean mass variability.

Gabriel Jordà (1), R. Steve Nerem (2), Michael Croteau (2), and David Wiese (3)

(1) IMEDEA (UIB-CSIC), IMEDEA, Esporles, Spain, (2) University of Colorado, Boulder, USA, (3) Jet Propulsion Laboratory (JPL-NASA), Pasadena, USA

Changes in the mass content of the Mediterranean sea are characterized using a the new JPL-Mascons gravimetric product for the period 2003-2015. The results are compared with previous estimates also based on GRACE measurements and with indirect estimates obtained from a combination of hydrographic observations, satellite altimetry and numerical modelling. Our results show that the JPL-Mascons provide a good representation of the Mediterranean mass variability (correlation with indirect estimates up to 0.85), significantly improving the previous gravimetric products (correlation lower than 0.3). Also it is shown that most of the Mediterranean mass variations at interannual scales are due to mass redistribution due to wind forcing around the Strait of Gibraltar. Sea level changes in the nearby Atlantic is a secondary source of mass variability in the Mediterranean. Also, we have estimated the role of salt changes in the variability of gravimetric derived mass estimates. Although changes in the salt content have little effect on the seasonal to interannual time scales they are non-negligible in what concerns multidecadal and long term trends.