



An Update of Sea Level Rise in the northwestern part of the Arabian Gulf

Abdulaziz Alothman (1), Machiel Bos (2), Rui Fernandes (2,3)

(1) King Abdulaziz City for Science and Technology, National Center for Geodesy & Navigation Technology, Riyadh, Saudi Arabia (aalothman@kacst.edu.sa), (2) SEGAL (UBI/IDL), Portugal, (3) TU Delft, The Netherlands

Relative sea level variations in the northwestern part of the Arabian Gulf have been estimated in the past using no more than 10 to 15 years of observations. In Alothman et al. (2014), we have almost doubled the period to 28.7 years by examining all available tide gauge data in the area and constructing a mean gauge time-series from seven coastal tide gauges. We found for the period 1979-2007 a relative sea level rise of about 2mm/yr, which correspond to an absolute sea level rise of about 1.5mm/yr based on the vertical displacement of GNSS stations in the region. By taking into account the temporal correlations we concluded that previous published results underestimate the true sea level rate error in this area by a factor of 5-10.

In this work, we discuss and update the methodology and results from Alothman et al. (2014), particularly by checking and extending the GNSS solutions. Since 3 of the 6 GPS stations used only started observing in the end of 2011, the longer time series have now significantly lower uncertainties in the estimated vertical rate.

In addition, we compare our results with GRACE derived ocean bottom pressure time series which are a good proxy of the changes in water mass in this area over time.