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Sea Level Rise in the northwestern part of the Arabian Gulf

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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 this study, 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 a relative sea level rise of 2.2 ± 0.5 mm/yr but we did not detect any significant acceleration. Using the subsidence observed at GPS stations in the area as an indication of the regional vertical land motion, the corresponding absolute sea level rise is 1.5 ± 0.8 mm/yr. By taking into account the temporal correlations we conclude that previous results underestimate the true sea level rate error in this area by a factor of 5-10. Based on the 1986–2005 period, we predict a relative sea level rise of 13 ± 3 cm by 2050 that falls within the range of the global estimate of 5-30 cm given by the Intergovernmental Panel on Climate Change.