



Analysis of Sea Level Rise in Singapore Strait

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Sea level in Singapore Strait is governed by various scale phenomena, from global to local. Global signals are dominated by the climate change and multi-decadal variability and associated sea level rise; at regional scale seasonal sea level variability is caused by ENSO-modulated monsoons; locally, astronomic tides are the strongest force. Tide gauge records in Singapore Strait are analyzed to derive local sea level trend, and attempts are made to attribute observed sea level variability to phenomena at various scales, from global to local. It is found that at annual scale, sea level anomalies in Singapore Strait are quasi-periodic, of the order of ± 15 cm, the highest during northeast monsoon and the lowest during southwest monsoon. Interannual regional sea level falls are associated with El Niño events, while the rises are related to La Niña episodes; both variations are in the range of ± 9 cm. At multi-decadal scale, sea level in Singapore Strait has been rising at the rate 1.2-1.9 mm/year for the period 1975–2009, 2.0 ± 0.3 mm/year for 1984–2009, and 1.3-4.7 mm/year for 1993–2009. When compared with the respective global trends of 2.0 ± 0.3 , 2.4, and 2.8 ± 0.8 mm/year, Singapore Strait sea level rise trend was weaker at the earlier period and stronger at the recent decade.