

(97)

Sea Level Rise in the Southern Coast of Sri Lanka

Indika K.W.

*Oceanography Division, National Aquatics Resources Research and Development Agency,
Colombo, Sri Lanka
iweligamage@yahoo.com*

Abstract

Sea level variation is short and long term fluctuation of water level by the forces of the location's astronomical, meteorological and hydrological properties. The volume of the ocean has been increasing by absorption of additional heat accumulated in the atmosphere by natural and anthropogenic activities during the last few decades. The high-frequency *in-situ* sea level observation from Mirissa station and satellite altimetry data from ECMWE, AVISO were used for the analysis of sea level dynamics from 1993 to 2021 in the southern coast of Sri Lanka. The Harmonic analysis tool for MATLAB version was used to quantify tidal constituents and derivation of tidal pattern based on form factor as presented Hicks in 2006. The resulted in tidal pattern is mixed semidiurnal ($F=0.275$, Range: 0.25 to 1.5), which is included two high tides (50 cm) and two low tides (11 cm) per day with different strengths within the micro-tidal category in the southern coast of Sri Lanka. The most dominant tidal constitutes are semidiurnal lunar (M2) through 0.082 cph frequency with 95% of significant level. The Power Spectral Density (PSD) of the tidal spectrum was captured two dominant peaks related to M2 and S2. The satellite-derived monthly average sea level fluctuation shows a significant seasonal signal with a range of 18-22 cm during the last 22 years on the southern coast of Sri Lanka. The maximum seasonal sea level variation was recorded from December to January, while the minimum from July to August. The peak month on the southern-coast is slightly later and lower than the peak month on the east-coast. The seasonal variation of the Southern coast is comparable to that of Sri Lanka's west coast. During the last five years, the maximum extreme sea level height recorded was less than 1 m. The long term sea level variation is a positive trend with approximately 3.12 mm per year in the Southern coast of Sri Lanka.

Keywords: Sea level, Seasonal, Sea level rise, Tide, Extreme height