

AN ASSESSMENT OF WAVE CLIMATE VARIABILITY USING ENERGY FLUX METHOD: A CASE STUDY IN THE COASTAL AREA OF NEGOMBO TO WADDUWA

RSG Ranatunga^{1*}, GP Gunasinghe¹, RMRM Jayathilaka²

¹ Faculty of Built Environment and Spatial Sciences, General Sir John Kotelawala Defence University, Southern Campus, Sri Lanka

² National Institute of Oceanographic Marine Sciences, National Aquatic Resources Research and Development Agency, Sri Lanka

*sitharagethmini@gmail.com

Wave climate can be described as the distribution of wave characteristics averaged over a period of time and for a particular location. Coastal erosion has significant impact from change of wave climate. The West coast of Sri Lanka is identified as a severely eroding coastline according to the Master Plan for Coast Erosion Management. This study quantifies the wave climate variability in the West coast of Sri Lanka using ECMWF (European Centre for Medium-Range Weather Forecasts) wave data, in particular, ERA 5 collected over the years from 1979 – 2019. The significant change in long-term wave climate variability and short-term wave climate variability, the variation in wave energy and extreme significant wave heights in the area were assessed in the study area. The significant increment can be seen in yearly average of wave parameters such as significant wave height, wave period, wind speed, sea surface temperature, wave energy and erosion rate during the short term (2010-2019). Therefore, short term wave climate variability has been significantly increased. As well as an increment of the power of wave energy with the height of the waves can be seen. With the effect of monsoon and the changes in wave parameters and wave energy the considerable coastal erosion is happening in West coast of Sri Lanka.

Key words: wave climate, wave parameters, energy flux, short-term, long-term, monsoon, coastal erosion, wave data