The Efficiency of Neural Networks to Model and Predict Monthly Mean Sea Level from Short Spans Applied to Alexandria Tide Gauge

Adel H. EL-SHAZLY, Egypt

Key words: Neural networks , mean sea level, Hydrography, modelling, prediction

SUMMARY

Traditionally, mean sea level MSL has been considered as a stable reference datum representing the vertical datum i.e. geoid. Recently it has been proven that sea level varies spatially due to sea surface topography and temporally due to changing of local and global meteorological conditions. The temporal variation known by sea level rise should be taken into consideration to study its effect on shoreline and consequently on the engineering works near shore. The proper determination of sea level rise can be done using the available monthly mean sea levels and the associated meteorological data. Unfortunately, in Egypt there are a few number of Tide gauges with continuous records, and even with tide gauges the data were interrupted by the war periods or other reasons. So, the available data for Egypt may be insufficient to the proper model of sea level rise using the traditional technique i.e. Least Squares. In this paper, The Neural Networks technique is suggested to model the short span mean sea level data compared to the Least squares. The monthly mean sea level associated with monthly meteorological data for seven years were considered. The Mean square error was estimated for each method of neural network and compared with the value computed using Least Squares technique. The methods of neural networks prove to be more effective in modelling and prediction of monthly mean sea level.