

ABSTRACT

Sea level prediction is highly needed for coastal communities. Mainly driven by tidal, the sea level predictions can be used for analyzing the disposal and movements of sediments, tracers and pollutants, off-shore engineering constructions, environmental observations, as well as for ship navigation. Prediction of tides usually use tidal harmonic analysis for long term tidal predictions. However, this tide harmonic analysis has several drawbacks i.e. the method can not be used for short-term and real-time forecasting or instant prediction. Moreover, the method requires a large number of tidal data measurements to obtain accurate prediction. In this paper, we propose a sea level prediction by using Artificial Neural Network (ANN) model approach, namely the Nonlinear Autoregressive Neural Network (NAR). The method is applied for predicting sea level in Tanjung Emas Harbor in Semarang, Indonesia. We compare results of the prediction by using NAR with prediction by using tidal harmonic analysis. The accuracy of the prediction is measured by calculating the RMSE value and R value. NAR produces R value 0.9566 for training data and 0.9567 for prediction data. The choice of number of hidden layers in the NAR can also affects the results of prediction, in term of RMSE value and R value. The results show that NAR method produces a better accuracy in predicting sea level than using the tidal harmonic analysis.

Keywords : tidal harmonic analysis, nonlinear, sea level, autoregressive neural networks, tidal level.