

## **Abstract**

Sea level prediction is important for many coastal engineering applications, such as for designing of engineering structures in coastal or in offshore, routing of vessels, predicting and preventing flood in low land coastal areas, etc. One classical method to predict sea level is by using the Tidal Harmonic Analysis, in which the sea level is approximated by summation of tidal components. The method usually needs long historical time series data, and it cannot predict non-tidal anomaly or sea-level anomaly. In this paper, we propose a sea level prediction by using the Autoregressive Integrated Moving Average (ARIMA) and the Seasonal Autoregressive Integrated Moving Average (SARIMA) to predict sea level. We choose a study case in Tanjung Mas Harbour in Semarang, Indonesia. Several input combinations for the ARIMA and the SARIMA are investigated for finding the best fit parameters. Results of prediction by using both methods are compared with the classical Tidal Harmonic Analysis. The accuracy of each method is investigated by calculating the RMSE and R value. Despite of the seasonal data that is used in this paper, the ARIMA method gives the best prediction

**Keywords:** *tidal harmonic analysis, autoregressive integrated moving average, seasonal autoregressive integrated moving average, tidal, sea level.*