RINGKASAN

AQSYAL SUMANTRI. Analisis Korelasi Regresi Elevasi Muka Laut dan Tekanan Udara di Perairan Pesisir Pulau Mantang, Kepulauan Riau. Dibimbing MARIO PUTRA SUHANA dan WIDODO SETIYO PRANOMO.

Perairan pesisir Pulau Mantang merupakan wilayah pulau kecil yang dipengaruhi oleh dinamika pasang surut astronomis dan non astronomis. Penelitian ini bertujuan untuk menganalisis karakteristik elevasi muka laut, hubungan tekanan udara terhadap residu elevasi muka laut, serta besar kontribusi dan respons residu terhadap perubahan tekanan udara. Data elevasi muka laut dianalisis menggunakan *toolbox t_tide* untuk memperoleh prediksi pasang surut dan residu muka laut. Sedangkan hubungan tekanan udara dengan residu dianalisis menggunakan uji normalitas *Lilliefors*, korelasi *Spearman*, *Pearson*, dan *Regresi linier* sederhana. Hasil analisis menunjukkan bahwa prediksi pasang surut mampu menjelaskan 82,3% variasi elevasi observasi, sedangkan 17,7% sisanya merupakan residu non astronomis. Komponen dominan pasang surut terdiri atas O1 sebesar 28,0 cm, M2 sebesar 26,1 cm, K1 sebesar 25,6 cm, dan S2 sebesar 12,3 cm dengan nilai Formzahl 1,395 sehingga tipe pasang surut termasuk campuran condong ke harian ganda. Hasil korelasi *Spearman* menunjukkan hubungan negatif yang signifikan antara tekanan udara dan residu elevasi muka laut dengan nilai -0,1633, p-value 0,000013, dan determinasi 2,67%. Hasil *Regresi linier* menghasilkan persamaan y = -2,9010x + 2927,7753 dengan R^2 sebesar 4,46%. Nilai slope menunjukkan bahwa setiap kenaikan tekanan udara 1 hPa cenderung menurunkan residu elevasi muka laut sebesar 2,90 cm. Dengan demikian, tekanan udara memiliki hubungan negatif yang signifikan terhadap residu elevasi muka laut, tetapi kontribusinya masih rendah sehingga bukan menjadi faktor utama dalam mengontrol perubahan residu selama periode pengamatan.

Kata kunci : Elevasi muka laut, Tekanan udara, t_tide, Korelasi, Pulau Mantang.

SUMMARY

AQSYAL SUMANTRI. *Correlation and Regression Analysis of Sea Level Elevastion and Air Pressure in the Coastal Waters of Mantang island, Riau islands*. *Supervised by* MARIO PUTRA SUHANA and WIDODO SETIYO PRANOMO.

The coastal waters of Mantang Island comprise a small island area influenced by both astronomical and non-astronomical tidal dynamics. This study aims to analyse the characteristics of sea level height, the relationship between air pressure and sea level height residuals, and the magnitude of the residuals' contribution and response to changes in air pressure. Sea level data were analysed using the t_tide toolbox to obtain tidal predictions and sea level residuals. Meanwhile, the relationship between air pressure and the residuals was analysed using the Lilliefors normality test, Spearman's and Pearson's correlations, and simple linear regression. The results of the analysis show that tidal predictions account for 82.3 per cent of the observed variation in sea level, whilst the remaining 17.7 per cent constitutes non-astronomical residuals. The dominant tidal components consist of O1 at 28.0 cm, M2 at 26.1 cm, K1 at 25.6 cm, and S2 at 12.3 cm, with a Formzahl value of 1.395; thus, the tidal type is classified as a mixture tending towards a double daily tide. The Spearman correlation results indicate a significant negative relationship between air pressure and sea-level elevation residuals, with a value of –0.1633, a p-value of 0.000013, and a coefficient of determination of 2.67 per cent. The results of the linear regression yielded the equation y = -2.9010x + 2927.7753 with an R^2 of 4.46%. The slope value indicates that every 1 hPa increase in air pressure tends to reduce the sea-level height residual by 2.90 cm. Thus, air pressure has a significant negative relationship with the sea-level height residual, but its contribution remains low and therefore does not constitute a major factor in controlling changes in the residual during the observation period.

Keywords : Sea level elevation, Air pressure, t_tide, Correlation, Mantang Island.