

ABSTRAC

THE STUDY OF BATHIMETRY CHANGE THROUGH MATHEMATICAL MODEL (CASE STUDY OF BENGKALIS STRAIT)

This research was aimed to know the bathimetry change through mathematical model based on the low tide flow circulation phenomenom. It was conducted in the beginning of January to March 2004. The model simulation result indicated there was a flow movement at open channel in whicle the flow went from left side to right of model domain. The existence of jetty at model domain caused a flow rotation in the right side. The maximum flow happened at $1,76 \text{ ms}^{-1}$. The result of model simulation at bathimetry change shown that flow crashed at bathimetry surface made erotion and sedimentation. The great erotion happened at the edge of jetty ran 100 mm/hour, while sedimentation maximum in upstream and downstream at 25 mm/hour. The tidal on Bengkalis Strait is the diurnal with the highest tide at 1,26 m (full moon session) and the lowest tide at 0,27 m. From the low level of sea water to high tide, the flow went from west to the edge at $0,094\text{-}0,758 \text{ ms}^{-1}$ and $0,014\text{-}0,101 \text{ ms}^{-1}$. While the flow went to west when low tide to high tide was $0,046\text{-}0,458 \text{ ms}^{-1}$ in the full moon and $0,045\text{-}0,439 \text{ ms}^{-1}$. In the month of real time of model simulation there was a change both sedimetation (around $0,1 \times 10^{-9} - 5,4 \times 10^{-9}$) and depth of sea level (around $0,1 \times 10^{-9} - 0,5 \times 10^{-9}$) on the Bengkalis Strait. Maximally it happened at south sea shore of Bengkalis Strait. The analysis rate of these actions in one month, so the netto was sedimentation process with the sedimentation fast was around $0,2866 \times 10^{-9} \text{ m/month}$ that influenced by the movement action of low tide in Bengkalis Strait.