

NUMERICAL MODEL OF TIDAL CIRCULATION IN PHANGNGA BAY, THAILAND

By Pramot Sojisuporn¹, Björn Kjerfve² and Somkiat Khokiattiwong³

1. Harbour Department, Yota Rd., Sampantawong, Bangkok (10100), Thailand

2. Belle W. Baruch Institute, University of South Carolina, Columbia, SC 29208, U.S.A.

3. Phuket Marine Biological Center, P.O. Box 60, Phuket (83000), Thailand

ABSTRACT

Phangnga Bay is (western Andaman Sea coast of southern Thailand) 80 km wide at the mouth, 60 km long, and has a total area of 2,800 km². The average depth is 14 m, with a maximum depth of 40 m at the mouth. The bay experiences a semidiurnal tide with a mean tidal range of 1.8 m. The bay area is under the influence of the northeast and southwest monsoons, and it receives 2,500 mm rainfall annually with the heaviest rainfall during the southwest monsoon season.

A 2-dimensional, vertically-averaged tidal circulation-dispersion model was applied to the bay area. The model was forced by tidal oscillations along the open boundaries, wind fields on the water surface, and fresh water discharges. The results from the model simulations showed the absence of large-scale residual tidal circulation in Phangnga Bay. Residual tidal eddies were the prominent features in all the model runs. Wind-driven circulation was largely responsible for advection and salt transport while tidal oscillation enhanced mixing and dispersion of salt in the bay.