Thesis Title	The Development of a Mathematical Model for Predicting the Distribution of Salinity and Water Quality Parameters in Shallow Lake with Tidal Inlets.
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Abstract

This thesis is a study to develop a mathematical model for predicting the distribution of salinity and water quality parameters in a shallow lake with tidal inlets. The model developed comprised of a hydrodynamic model for predicting flow velocities and depths and a water quality model for predicting BOD and DO distributions. The hydrodynamic model was based on the two-dimensional depth-averaged momentum and continuity equations. The water quality model was formulated from the mass conservation principle. The governing equations were transformed into numerical forms by a Finite Difference scheme, employing the Alternating-Direction-Implicit (ADI) method for solution. The models were coded in Fortran and the results could be displayed graphically.

The models were calibrated and validated with Songkla Lake data. The results of the prediction were found to be of acceptable level of accuracy. Therefore, the models could be used as a management tool to study the effects of environmental on the water quality in a lake.

Keywords: Mathematical Models / Shallow Lake / Finite Difference / Water Quality / Salinity Distribution