**Session II – Envisioning New Approaches to Managing Great Deltas, Great Rivers, and Great Lakes**
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# Water Quality Assessment at Klong U-Tapao Wetland, Southern Thailand by the Mike 11 Model

Piyakarn Teartisup, Ph.D.

Assistant Professor, Faculty of Environment and Natural Resource Studies, Mahidol University, Thailand, Email: enptt@mahidol.ac.th

## Abstract

Klong U-Tapao wetland is the tributary of Songkhla Lake Basin, Southern Thailand. The water quality in this area was assessed through mathematic model MIKE 11. The researcher analyzed hydraulic, dispersion characteristics and water quality coefficients. There were 3 key parameters used to represent the hydrodynamic and water quality conditions of surface water: 1) water flow data in 2005 at the minimum average value of 20 percent, 2) BOD, and 3) DO. Three core modules of the MIKE 11 model predicted that changes of water quality would occur in 2007, 2012, 2017, 2022 and 2027. These changes will happen under the condition of BOD loading from the livestock sector being reduced to lower than 60 mg/l, community and industry sector contribution reduced to lower than 40 mg/l, and wastewater cut to lower than 10 mg/l of total loading. The result of calibration using the NAM Model found that the water level, from calculations and surveying, had a correlation coefficient = 0.812 (good relevance). A suitable factor derived was the Transport Dispersion Model, of which the selected dispersion coefficient was 100 $m^2/s$. The results from the Water Quality Model, from which BOD, DO and water temperature were calibrated, were as follows: $1^{st}$ order degradation constant for BOD at 20 degree Celsius = 0.15 per day maximum oxygen production by photosynthesis, at 20 degree Celsius = 1 $g.O_2/m^2/day$, and the respiration of plants and animals at 20 degree Celsius = 1 $g.O_2/m^2/day$. Water quality survey and calculation results show that water quality gradually worsened from upstream to downstream. In general, the Klong U-Tapao wetland depends on wastewater discharge and river water flow. The results of this paper show that reduction in BOD loading from all activities, as well as wastewater, are 10 percent of total loading. The water quality of this wetland will be lower than 2 mg/l, fairly good for Thai water quality standards.