

**ASSESSING ECOLOGICAL RISK AND CARRYING OF COASTAL SEAS:
THE CASE IN SAMUT PRAKARN PROVINCE AND MAB TAPUD
INDUSTRIAL ESTATE (RAYONG PROVINCE)**

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This study assessed carrying capacity and ecological risk in coastal marine environments of the coastal areas in Samut Prakan Province and Map Ta Phut Industrial Estate in Rayong Province, where water quality is impaired by mercury from point and non-point sources. The assessment focused on mercury as the stressor and formulated Hazard Quotient (HQ) and Carrying Capacity Quotient (CQ) to reflect exposure levels of a particular type of organism to mercury. Basically, the quotients compare stress conditions (EEL) with digestion rates of ingested food (TRV). The magnitude of EEL is dependent on concentration of mercury in water column and exposure characteristics (direct contact, food chain or both paths). The study used RMA2 model to estimate hydrological states of the areas as being influenced by wind, tide and river discharges. Results of the hydrological model were then used by RMA4 model to determine fate of mercury in water column, which is controlled by the chemical, biological and hydrological interactions. Furthermore, an ecological study was performed to assess the components of the coastal ecosystems of the study areas especially on structures of the food chains and living organisms. The data obtained from the models and ecological study eventually was used to determine the EEL values. For TRV, which inherently reflect the acceptable or threshold levels of mercury concentration in environment, the values were extracted both from toxicological literatures and toxicology studies conducted in the study for local organisms.

The risk assessment showed that most of ecological components within the food chain of the coastal areas of Samut Prakarn Province are subjected to somewhat high risk. Only organisms within the same level of the food chain as the keystone species (benthos) are not yet under such high risks while primary producers have lower risks. At Map Ta Phut Industrial Estate, the average risk levels were relatively lower compared to Samut Prakarn Province. The components of the food chain, from primary producers to top consumers, are under low risk conditions. In both study areas, it was observed that shrimps, which are bottom feeders, are under relatively high risks. The carrying capacity assessment revealed that most areas of the both study sites still have high capacity of dilution effect. However, in few areas where some organisms are considerably sensitive to mercury, carrying capacity was quite low.