

Recent Eutrophication Problems and their Impacts on Chlorophyll *a* and Hypoxia Condition in the Inner Gulf of Thailand

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Abstract

This research work was carried out during 2017-2018 with the objectives to clarify climate impacts on freshwater inflows, consequent increases of eutrophication problems, and related hypoxia situations in the Inner Gulf of Thailand. The changes during the past decade, and their impacts on primary productions (chlorophyll *a*) and related biological important factors were also analyzed. Results on spatial distributions and seasonal changes of chlorophyll *a* during early-, mid-, and late-loading periods had illustrated severe red tide outbreaks in particular estuarine and mid-gulf zones. Those occurrences were majorly rolled by integrated functions of inflows, current, and monsoon affected. The red tide outbreaks were recorded > 20 times during 2018. Chlorophyll *a* concentrations reached the highest levels (> 43.8 µg/L) during early- to mid- loading periods. Such phytoplankton blooms enhanced very high dissolved oxygen (maximum DO of 14.7 mg/L) in surface layers during the day times. Nevertheless, hypoxia with DO < 2-3 mg/L were noticed in sub-surface to bottom layers (with water depths of > 5 m) along various lower estuarine sites, particular during the mid-loading periods in 2018. Accordingly, mortalities of fishery resources along the eastern region of the Inner Gulf of Thailand were remarkably observed. The overall views reflected severe problems from eutrophication on either the ecological stability or the marine fishery resources. Effective co-managements on conservation and remediation of water qualities are, thus, urgently needed.