CHAPTER 4

CONCLUSION

The study of the effect of oxygen and salinity on metal concentrations in overlying water under controlled conditions showed that in oxic condition metal was removed from water body faster than anoxic condition. The adsorption and complexation processes may be dominant process in controlling metal concentration in oxic condition while in anoxic condition solubility is a dominant process. The removal of Cd, Cu and Pb from water body occurred at high salinity. The declination profile of Pb showed different pattern of Cd and Cu profiles.

The benthic fluxes of dissolved Cd, Cu, Pb, Fe and Mn across sediment-water interface were studied using translucent and opaque lab-built benthic chambers. Metals exchanges in the light and dark chambers were examined for 30 and 56 hours at two stations, which have different salinity (Kor-Yor; 10 psu and Khoa-Daeng; 30 psu) in the Outer Songkhla Lake. Positive fluxes were found in the light chambers at Kor-Yor, which suggested that Cd, Cu, Fe and Mn were removed from sediment into the water column while in the dark chambers, Pb and Mn were released from sediment into the overlying water. At Khao-Daeng, the seasonal fluxes were examined. The dry season, the results suggested that Cd, and Mn in light chamber were removed from water body into sediment surface while in dark chambers, Fe and Mn were released from sediments to the overlying water. The mobility of metals in light chambers may exhibit the biogeochemical process in shallow lake which is an aerobic condition while the behaviour of metals in the dark chamber represented the hypoxic condition particularly during the period of algae bloom. In wet season, benthic fluxes indicated the removal of Cd, Cu and Pb from water body into sediment in both light and dark conditions. The difference of benthic fluxes at the Kor-Yor and Khao-Deang may derive from differences in the environmental conditions (temperature, salinity, organic carbon content) or from the evolution of the physico-chemical parameters (oxygen and pH) during the experiments.

The transportation of dissolved metals from pore water in the sediment into the overlying water or so-called diffusive flux was investigated. Diffusive fluxes of all metals were positive values indicating that the sediment was a source of these metals to the overlying waters of the Lake. Mn has the highest diffusive flux values followed by Fe, Pb, Cu and Cd. In addition, diffusive fluxes in this study are within the same range of the fluxes of metals from the Bang Pakong estuary reported by Chevaporn et al. (1995). No significant differences of diffusive fluxes of most metals were found between light and dark chamber in wet season, while small difference of the diffusive fluxes of Fe and Mn was observed in dry season. The enrichment of Cd, Cu, Pb, Fe and Mn in the pore water relative to the overlying water was found. Similar behaviors of metals were occurred in Bang Pakong estuary (Chevaporn et al.; 1995).

Upon comparison of benthic flux and diffusive flux, they were different. However, the benthic flux and diffusive flux of Cd Cu and Pb were in the same order of magnitude while benthic fluxes of Fe and Mn were significant different from the diffusive fluxes in one to two orders of magnitude. These fluxes were derived from samples collected in different time, this could be responsible for the differences. The significant difference in the benthic fluxes and diffusive fluxes of Cu, Fe, Ni and Zn were also reported by Ciceri *et al*. (1992) and Turetta *et al*. (2005).