



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics
and
Department of Ocean Science

JOINT SEMINAR NOTICE

**A comparative study of hypoxia and acidification in
two large river dominated coastal ocean systems
(northern Gulf of Mexico and East China Sea)**

by

**Prof. CAI Wei-Jun
School of Marine Science and Policy
University of Delaware, Newark,
USA**

Abstract

The northern Gulf of Mexico (nGOM) and the East China Sea (ECS) face similar physical drivers and anthropogenic stressors. Both systems are strongly influenced by large river discharge and intense eutrophication due to agriculture and population growth. Bottom water hypoxia and acidification appear to grow more severe in recent years in both systems. In the surface water of the nGOM and ECS, the spatial distributions of O₂ and pH are associated with the trajectory of the river plumes and *in situ* biological activity driven by riverine nutrients. In both plume regions the highest O₂ and pH values and lowest pCO₂ values were observed at intermediate salinities where light and nutrient were both favorable for phytoplankton production. In the bottom layer, low O₂ and pH values were observed in hypoxic waters. The subsurface pH shows correlations with DIC and apparent oxygen utilization (AOU), suggesting that decomposition of organic matter was the dominant factor regulating pH variability. In addition to the low O₂ and pH in the hypoxic bottom water, there was a layer of low O₂ and pH at mid-water depth in the nGOM. T-S diagrams and numerical modeling suggest that this mid-water acidification and hypoxia was mainly a result of intrusion of low O₂ and pH water from a nearshore bottom layer. This extension of hypoxia and acidification from the nearshore bottom to the offshore mid-depth can form rapidly after a storm disruption and can then extend further to the bottom. Lateral transport also plays an important role in the formation of hypoxia and acidification in the ECS. I will discuss the common drivers and the differences between these two large-river dominated, eutrophic coastal systems.

Date : 21 October, 2019 (Monday)
Time : 2:00pm – 4:00pm
Venue : Room 2408 (Lift no. 17/18)
HKUST, Clear Water Bay, Kowloon

(Host faculty: Prof. GAN Jianping)

All Are Welcome!