**Recent Advances in Understanding the Complex Impacts of Rivers on Coastal and Continental Shelf Environments**

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*Abstract*- Deltaic coasts and shelves are produced where rivers enter the coastal ocean. Historically, these environments have played important socio-economic roles: deltas were the sites of early agriculture and formative civilizations and presently support some of world's largest urban centers (e.g. Shanghai, Bangkok and Cairo). Deltas are also sinks for terrestrial carbon and are sources of fossil fuel. At the most basic level, river-ocean intersections are distinguished by the delivery to the sea of *sediment, buoyancy and nutrients*. The interactions among these three factors and human-induced coastal modifications are profoundly complex. From the human perspective, the consequences may, at the same time be both beneficial and detrimental. Traditionally, sediment input by rivers has been important to land building but dams and river control projects have, in many cases, reduced or halted the vital supply. Coastal Louisiana in the lower Mississippi Delta is presently losing land at the rate of 65-90 $km^2yr^{-1}$, in part because a large fraction of the sediment load is now channeled into deep water by engineering works. The detrimental reduction in sediment load has been accompanied by delivery of an excess of nutrients from the vast Mississippi watershed leading to the hypoxia that plagues the shelf waters to the west of the active Mississippi delta. This situation is exacerbated by the buoyancy input which stratifies the water column and isolates the bed layer from the oxygenated surface layer. Over the past decade or so, there have been major advances in observing and modeling the processes associated with deltaic shelves and in the formulation of management strategies for these systems. In this presentation, these advances will be summarized with particular emphasis on new understandings of river-borne sediment dissemination and oxygen dynamics on deltaic shelves.