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The prediction of cohesive sediment concentration and its transport is vital to managers in coping with problems such as wetland protection and restoration, maintenance of navigation channels, residual onshore sediment transport, etc. Detailed mathematical models including three dimensional codes are necessary tools for the development and application of this knowledge. It is well known that the transport and the fate of fine-grained sediments in dynamic environments like estuaries and coastal waters are a function of sediments effective settling velocity. Settling velocity is affected by flocculation process.

In this study, a three-dimensional hydrodynamics and sediment transport model that is called ECOMSED is used as the major model framework. ECOMSED is a state-of-the-art hydrodynamics and sediment transport model that is capable of computing and predicting water circulation, temperature and salinity; mixing, transport, deposition, and resuspension of cohesive and non-cohesive sediments. A model for flocculation is introduced and implemented in ECOMSED together with mass conservation and momentum equations, turbulence closure model, and a number of algebraic relations to relate floc size, settling velocity, mass and volumetric concentration together. Properties of soil are taken into account by constitutive equations for effective stress and permeability.

This model is created to describe the evolution of flocs' settling velocity as a function of various parameters, i.e. the dissipation parameter and suspended sediment concentration. Furthermore, the process of consolidation of soft mud is modeled by using Gibson equation. Hence, in the next step, with using this model will enable us to study the influence of 3-Gorges Dam and natural phenomena, e.g. tidal straining, on parameters like sediment transport, erosion and deposition in a local system that is comprised of Yangtze River, the Yellow Sea, East China Sea, and even Sea of Japan (Figs.1-2)

Fig.1 Local system comprised of Yangtze River and 3 seas

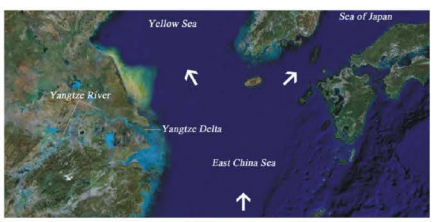

Fig.2 Yangtze River mouse and delta

Plant remains in the deltaic deposits of Indian subcontinent as environment assessment indicators during Holocene

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The deltaic deposits of Indian subcontinent lying in the tropical latitude have records of rich mangrove plant assemblage in the Holocene. The assemblages are represented in a distinctly identifiable ecosuccession developed by the influence of degree of salinity in the estuaries. The Ganga - Brahmaputra (GB) deltaic basin has maximum diversity of mangrove plants with distinctive ecosuccession as Swampy Mangrove, Tidal Mangrove, True Mangrove decline, Colonisation of Nonlittoral species and non Mangrove fresh water species. This ecosuccession has been utilized for environment assessment of the deltaic deposits in the west and east coast of Indian subcontinent. The assessment of the ecosuccession has identified the major events of change of environment such as the Flandrian Transgression, the phase of higher rate of precipitation and the phase of drier condition in all the deltaic basins. Critical survey of present day ecosuccession of the different delta indicates the natural process of development of the individual delta.

Deltas on Indian east coast: monsoon impact and human influences

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