Geophysical Research Abstracts
Vol. 19, EGU2017-5304, 2017
EGU General Assembly 2017

River salinity within a mega delta; tide and river interactions

Lucy Bricheno and Judith Wolf
National Oceanography Centre, Joseph Proudman Building, Liverpool, United Kingdom (luic@noc.ac.uk)

With an average freshwater discharge of around 40,000 cubic metres the BGM (Brahmaputra Ganges and Meghna) river system has the third largest discharge worldwide. The finite volume coastal ocean model (FVCOM) has been applied to the BGM delta in order to simulate river and coastal salinity under present and future climate conditions. Under future climate scenarios sea levels in the Bay of Bengal are (conservatively) projected to rise by between 0.38 m and 0.63 m by the year 2100. Rising sea levels and changes in river discharge rates will have a strong impact in river salinity within the delta.

The model connects the open ocean, and inland river catchments which meet and interact in the delta region. Here, strong freshwater currents in deep river channels meet and mix with an incoming ocean with a large tidal range in a complex estuarine system. The BGM delta contains a range of estuarine environments in single system; from highly saline 'dry' creeks which are tidally dominated; to the very fresh mouths of the Ganges where the bulk of the river discharge enters the ocean.

Forced by a combination of regional climate model predictions, and a basin-wide river catchment model, the 3D baroclinic delta model can determine salinity under the current climate, and make predictions for future wet and dry years. The river salinity demonstrates a strong seasonal and tidal cycle, making it important for the model to be able to capture a wide range of timescales. We will also present results on how salinity penetration inland will change under a range of sea level rise scenarios.