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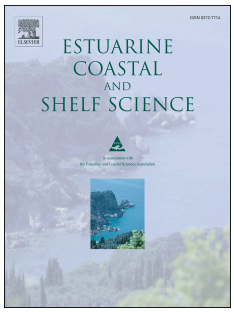

Tidal intrusion within a mega delta: An unstructured grid modelling approach

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PII: S0272-7714(16)30379-1

DOI: 10.1016/j.ecss.2016.09.014

Reference: YECSS 5254

To appear in: *Estuarine, Coastal and Shelf Science*

Received Date: 18 July 2016

Revised Date: 13 September 2016

Accepted Date: 20 September 2016

Please cite this article as: Bricheno, L.M., Wolf, J., Islam, S., Tidal intrusion within a mega delta: An unstructured grid modelling approach, *Estuarine, Coastal and Shelf Science* (2016), doi: 10.1016/j.ecss.2016.09.014.

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Tidal intrusion within a mega delta: an unstructured grid modelling approach.

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Abstract

The finite volume community ocean model (FVCOM) has been applied to the Ganges-Brahmaputra-Meghna (GBM) delta in the northern part of the Bay of Bengal in order to simulate tidal hydrodynamics and freshwater flow in a complex river system. The delta region is data-poor in observations of both bathymetry and water level; making it a challenge for accurate hydrodynamic models be configured for and validated in this area. This is the first 3D baroclinic model covering the whole GBM delta from deep water beyond the shelf break to 250 km inland, the limit of tidal penetration.

This paper examines what controls tidal penetration from the open coast into an intricate system of river channels. A modelling approach is used to improve understanding of the hydrodynamics of the GBM delta system. Tidal penetration is controlled by a combination of bathymetry, channel geometry, bottom friction, and river flow. The simulated tides must be validated before this delta model is used further to investigate baroclinic processes, river salinity and future change in this area. The performance of FVCOM tidal model configuration is evaluated at a range of

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