KOLKATA PORT, WEST BENGAL

Background
The Kolkata Port (KoPT), located on the left bank of Hugli River is the first major as well as the only riverine port in India. The Haldia Dock Complex (HDC) is located on the right bank of the river at the confluence of Haldi and Hugli rivers. It has longest approach Channel of 145 km. The Bhagirathi – Hugli river system is a major distributary of River Ganga in West Bengal. The entire stretch of 280 km of river is influenced by the tides extending from Saugor downstream to Nabadwip upstream. Small rivers like Haldi, Roopnarayan, Damodar, and Churni carry large amount of sediments into Hugli River during monsoon season. This is a tidal port with severe restriction in draft and very high maintenance dredging. The dynamic nature of estuary results in frequent shifting of the navigation channels.

Studies Conducted
- Initially, the studies related to KoPT mainly pertained to river training and bank protection works in the upstream reaches of Hugli river and in the upstream of Kolkata.
- Subsequently, the studies were carried for development of port facilities and navigation channel from Saugor to Kolkata including few estuarine training works.
- All these studies were carried out CWPRS right from 1950's on different scale models. Afterwards the existing Hugli model (scale 1:600 H and 1: 100 V) was constructed and extensive studies were carried out. Hugli model was equipped with automatic tide generating system, and arrangement to release varying upland river discharges. Later the mathematical models were developed using MIKE 21 HD/MT for upcoming studies and all proposals were studied using mathematical models.

Outcome and Benefits
- Improvement in river capacities in port reach by 41 MCM
- Salinity wedge pushed down from 30 km upstream of Kolkata to 30 km downstream
- Dredging requirement in Kolkata port reach reduced to nil
- Number of occurrence of bore days reduced from 150 to 20 per year
- Increase in container traffic from 30 TEU to 1,40,000 TEU
- Stabilization of low water crossings
- Reduction in turnaround time of ships
- Declaration of Inland Waterway (IW-2)
- Suitable remedial measures in the form of bank protection work etc.
- Flow diversion measures such as guide walls, spurs and orientation of jetties.
- Sedimentation and scouring phenomena and remedial measures.
- Design of navigation channels and their behavior

Numerical Model : Bed level Change
Central Water and Power Research Station, Pune

- Suitable reclamation techniques and measures for stability of islands
- Study of impact of upland discharges
- Development of minor ports and fishing harbours

Numerical Model: wind generated wave field