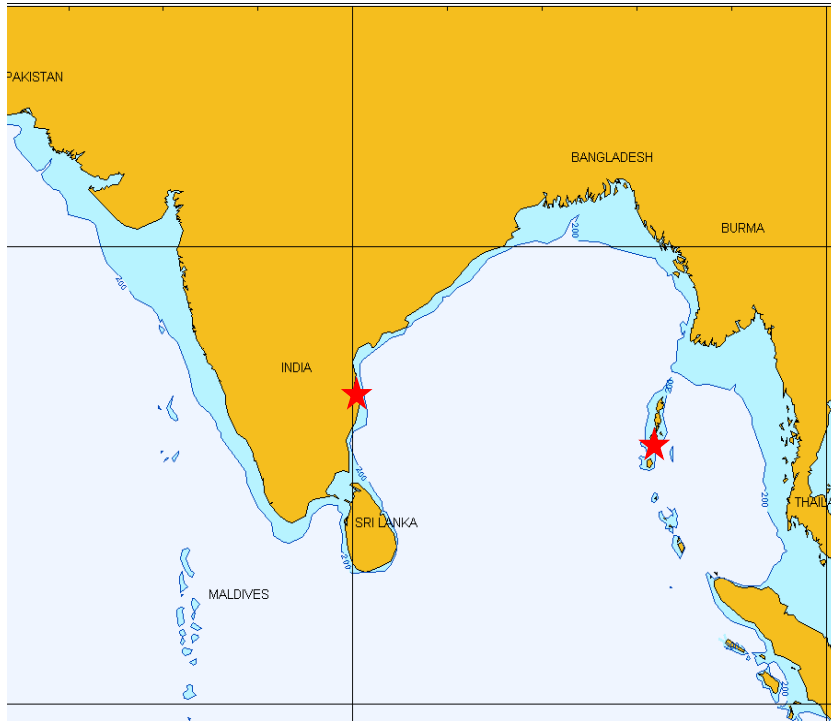




National Institute of Ocean Technology

NIOT is a technical arm of Indian Ministry of Earth Sciences. The main campus is located at Chennai and has a field station at Port Blair, Andaman Is.



NIOT has five major Groups working in technology Development in the fields of

- Deep sea mining
- Coastal and Environmental Engineering
- Energy and Freshwater from Sea
- Marine Instrumentation
- Ocean science and Technology for Islands

and two Operational Groups

- Vessel management cell
- National Data Buoy program

Coastal Processes Modeling

CEE group is involved in modeling of coastal processes.

The field data is sourced from own observation (tide, current, bathymetry and wave) for site specific studies, mostly funded by industry.

Industry sponsored studies like port development (wave tranquility, sedimentation, etc), effluent discharge, beach stabilisation, dredging quantification have been carried out.

MIKE models have been used for studies and open source models are being attempted (eg. ADCIRC for tidal propagation)

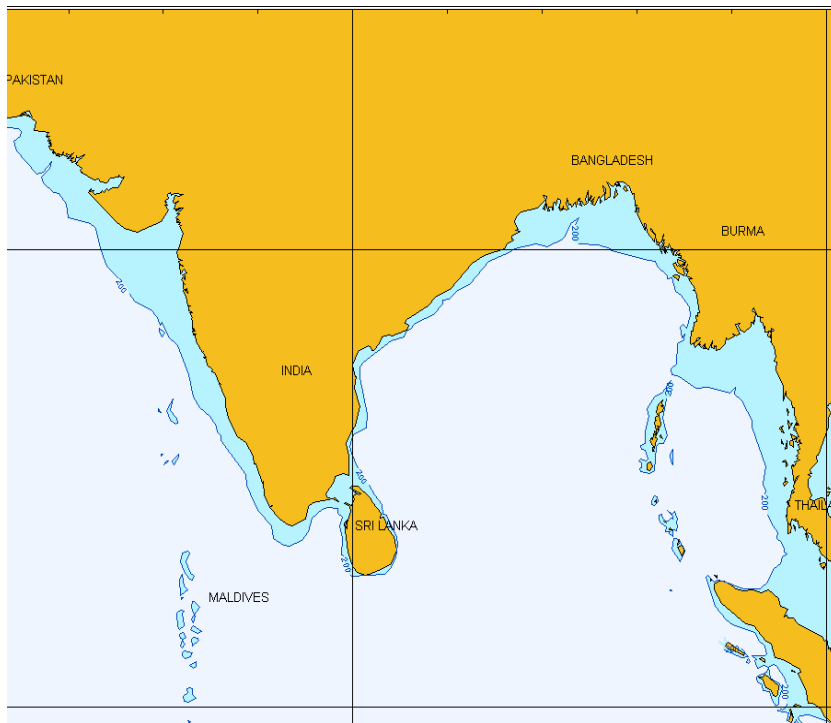
Studying Coastal Processes

- Under XI-five year plan (2007-12) following programs have been initiated
 - Creation of Technical criteria atlas for Indian Coast
 - Sustainable shoreline management
- Some part of work will overlap between these projects (eg. site characterization).
- Preliminary study using secondary data is in progress.

Technical Criteria Atlas

The project aims to create a reference atlas for coastal engineering parameters

The parameters to be covered –



- design wave heights with return periods
- Currents at select sites
- sediment transport rate
- Tidal variation

Planners for coastal engineering work do not have access to such data at present

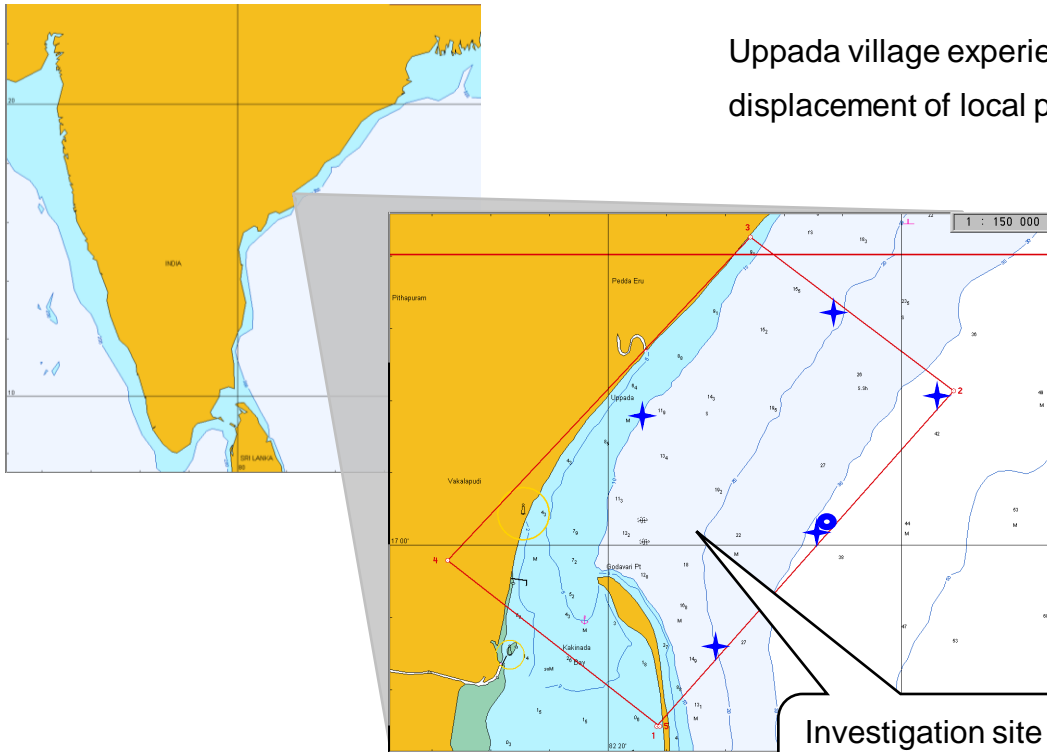
At planning level and site selection process this will play an important role and avoid expensive site specific data collection before committing to the project

Sustainable Shoreline Management program

- The program aims to study sites that are prone to coastal erosion and mitigation on experimental basis.
- Two sites (Uppada, AP and Ennore TN) have been selected in the first stage.
- The work involves
 - site characterization by field data
 - modeling to mimic the present state
 - predict the effect of engineering intervention
 - Install protection scheme (beach nourishment, offshore breakwater, seawall, etc)
 - Monitor on long term observation (bathymetry, grain size distribution, beach profile)
 - Improve the model effort to converge on actual behavior so that refinement on shore protection is possible.

Shore Stabilisation at Uppada, AP

Uppada village experiences severe erosion resulting in large scale displacement of local people.



NIOT has initiated a long term program in line with XI-plan proposals to study and find a solution.

Under this program it is proposed to install shore parallel geotubes (long cylinder of geosynthetic textile filled with sand) as protection against erosion.

The program includes observation of long shore sediment movement before and after installation of shore protection scheme

Investigation site
on erosion near
Uppada

Shore line Stabilization

Uppada, AP

- Data analysis in progress
- NCEP wind model to derive long term wave statistics in progress



Ennore, TN

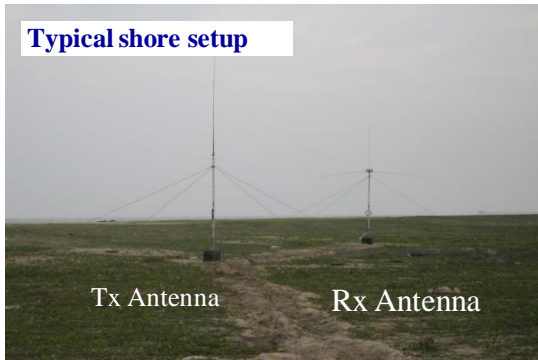
- Study based on available data is completed
- Geosynthetic based Low crested structure will be installed in jun-jul 2008.
- Monitoring and modeling effort will be continued for possible refinement



Tsunami Early Warning System

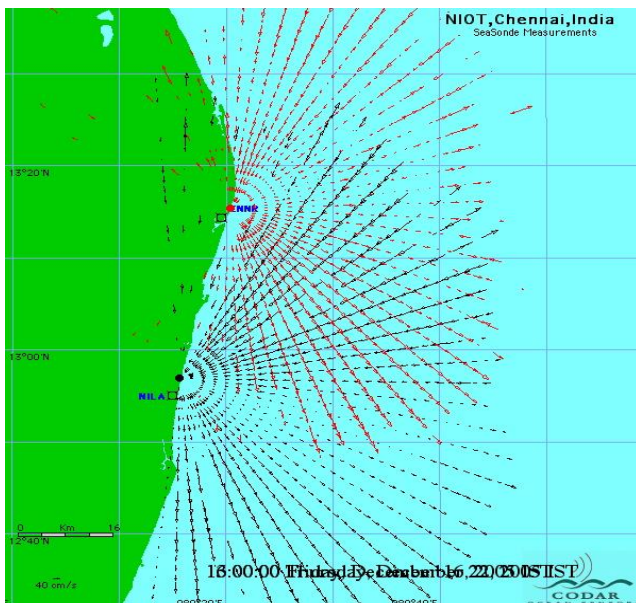
- NIOT contributes to TEWS by way of
 - Installing and maintaining deep water bottom pressure recorders to observe tsunami propagation
 - Installing and maintaining a network of 15 tide gauges in the islands and mainland to detect tsunami occurrence
 - Installing and Maintaining 5 pairs of HF radars for observation of coastal surface current pattern

Regional Surface Current Measurement (HF Radar)

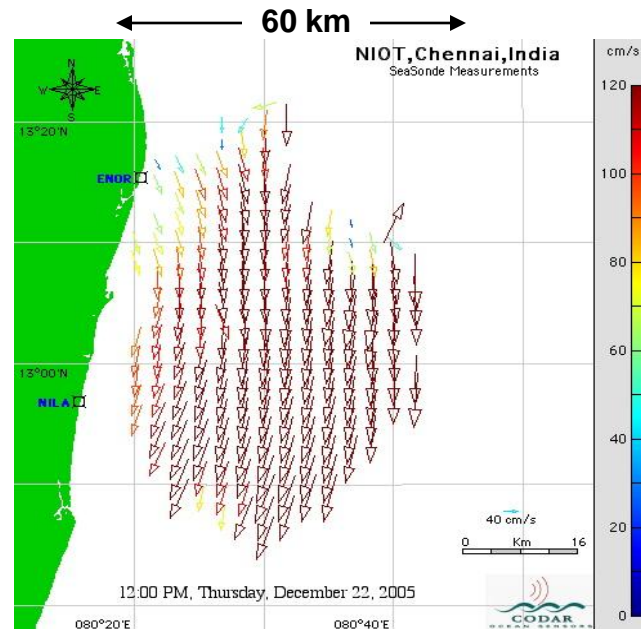


HF Radar Measures reflected signals from sea surface and works out surface current and Wave parameters. A pair of HF radar stations can cover about 3000 sq. km area off-shore.

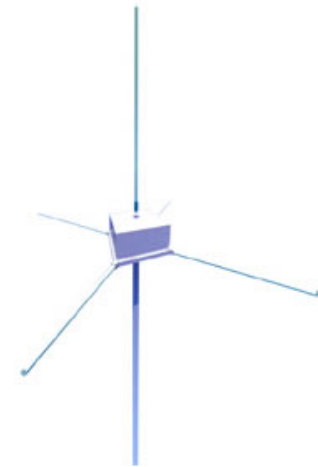
The Installation at Chennai consists of two stations a Neelangarai (south) and Ennore (north) and has a coverage from Pulicat lake to Muttukadu and 60 km in the sea.



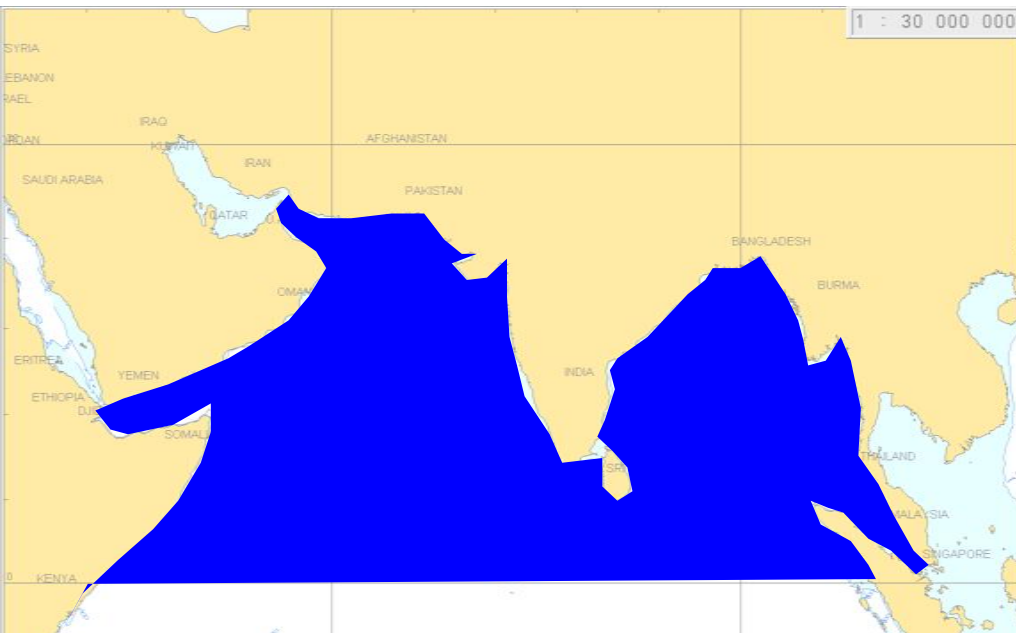
Observed Current Radial



Observed Current Vector



Regional Tide model



Its is proposed to create a regional tide model for the Indian Coast (North Indian Ocean Tide Model - NIOTM). This model will be part of XI-plan project (Technical criteria Atlas) and will also help to establish a operational tide prediction facility on the web, accessible for various users.

Thank You