

# **PAKISTAN NATIONAL REPORT**

**14<sup>th</sup> NIOHC MEETING**

**BANGKOK, THAILAND**

**26-28 FEBRUARY 2014**

**BY  
PAKISTAN NAVY HYDROGRAPHIC DEPARTMENT**



# SCHEME

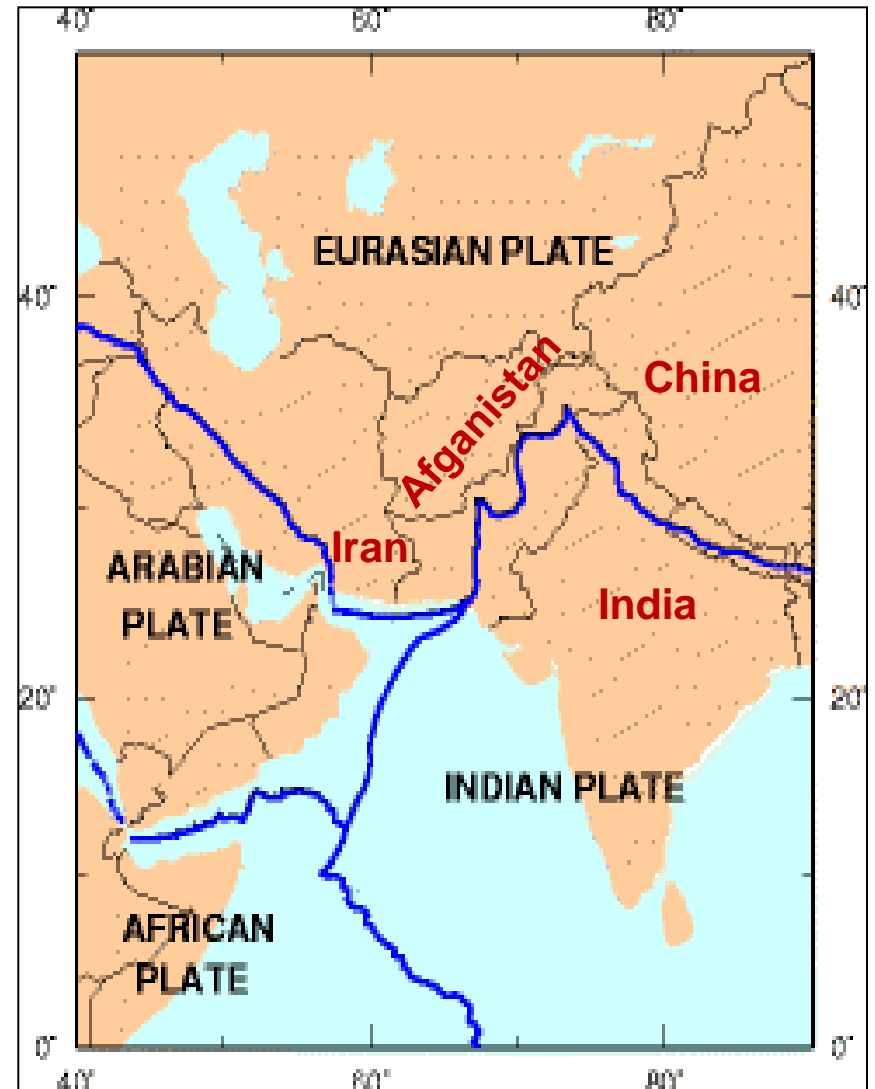
- Introduction
- Islets emergence along the coast
- Hydrographic Components
- Capacity Building
- Oceanographic Activities

# INTRODUCTION

- Pakistan Navy Hydrographic Department (PNHD) was established in 1949
- The department is equipped to
  - Undertake surveys as per IHO standards
  - Produce Nautical/ INT Charts/ ENC's and relevant nautical publications

# Pakistan's Geography

- ▶ Pakistan geologically overlaps with Indian and Eurasian tectonic plates
  - 2 provinces lie on the north-western corner of the Indian plate
  - Other 2 lie at the Eurasian plate



# HYDROGRAPHIC SUREVYS

- ▶ Pakistan coast is 990 Km long extending from Indian border in the east to the Iranian border in the west



# Coast Line of Pakistan

- Based on topography and physical features, the coast is categorized into two types; **Sindh** and **Makran coast**



# Low lying Area (LW)



# Low lying Sindh Coast



**Hilly terrain**



**Sandy beaches**



**Rigid coast**

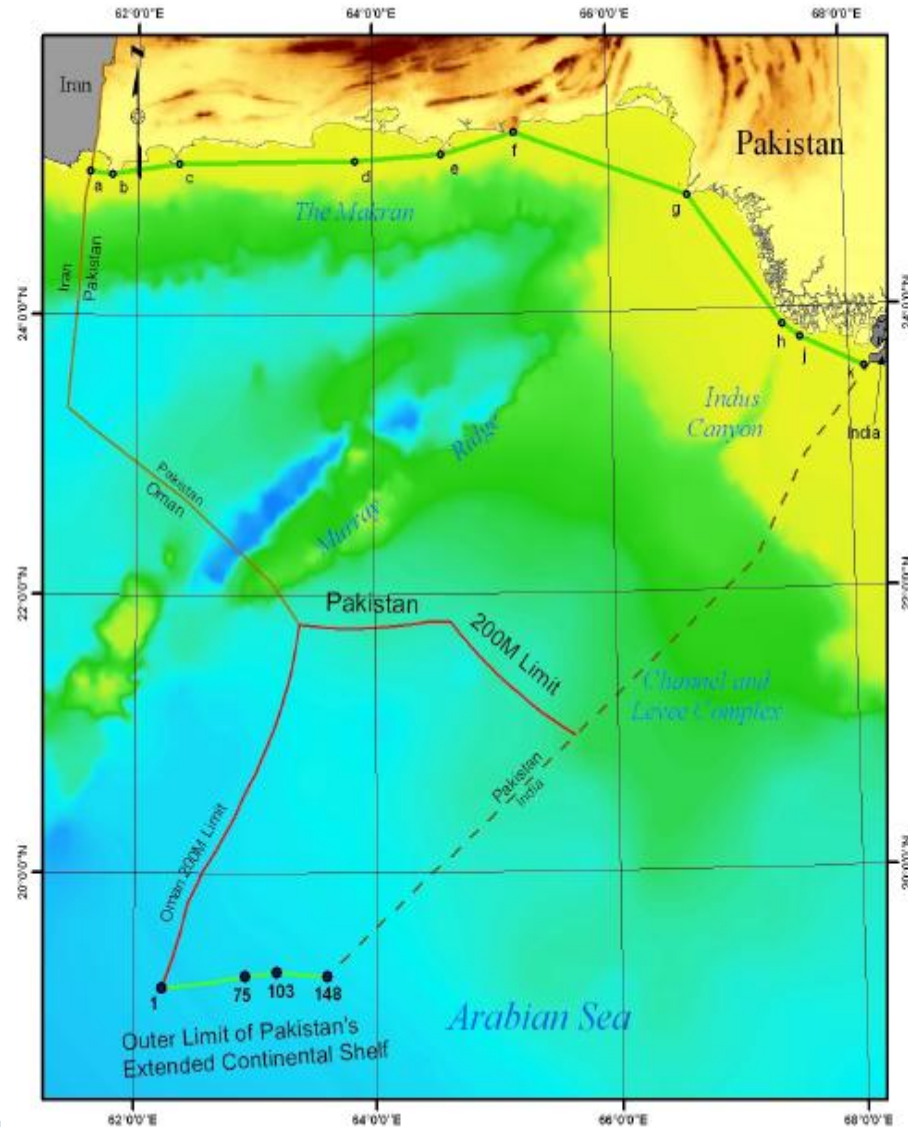


## Topography of Makran Coast

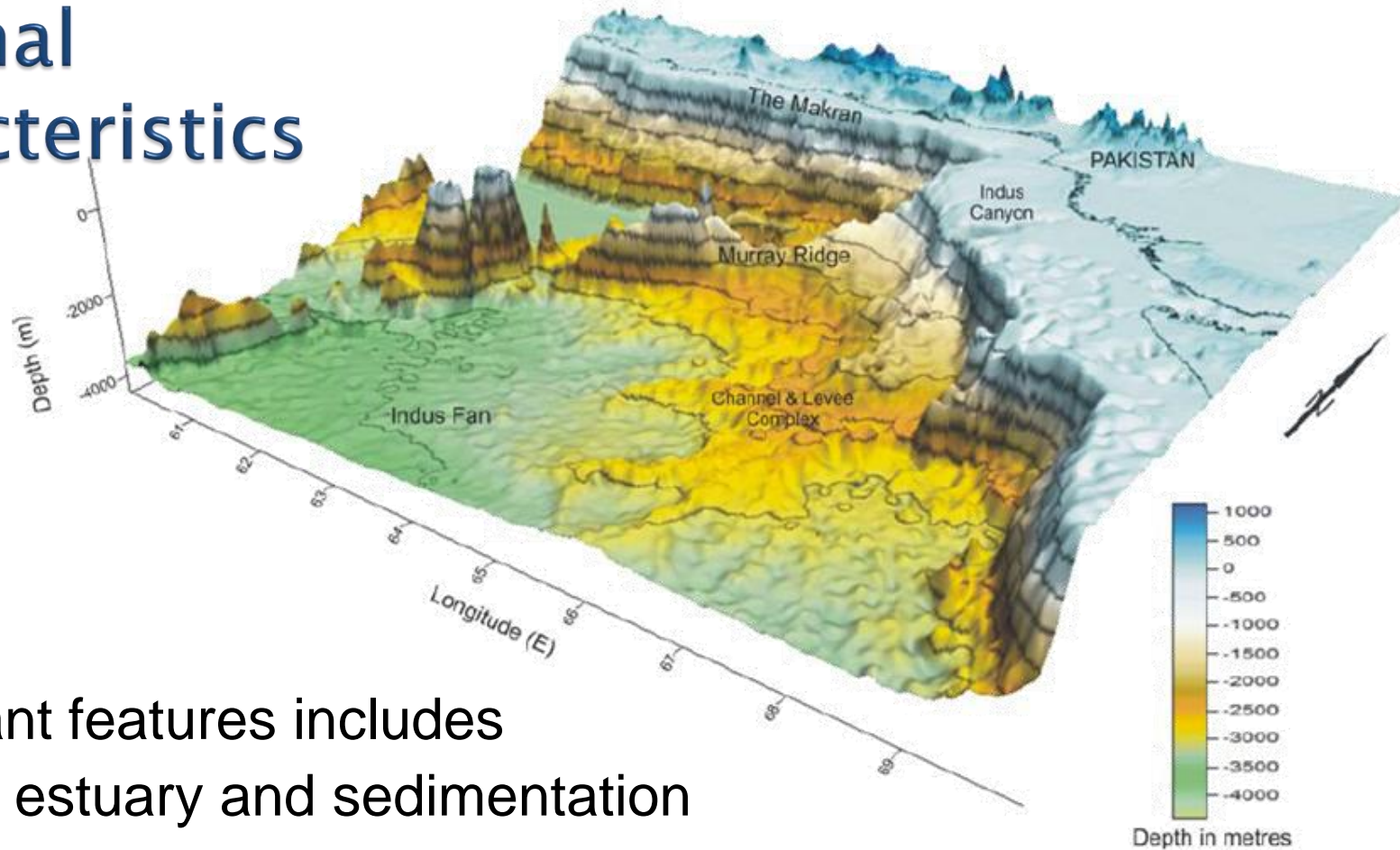


# Offshore Area

- ▶ EEZ is about 240K Sq Km
- ▶ Potential extension of continental shelf area of about 50,000 Sq Km
- ▶ As such, the total maritime zone of Pakistan is over 30% of the land area
- ▶ Pursuing for CS extension with UNCLCS
- ▶ Sub Commission has been formulated and analysis in progress



# Regional Characteristics



- ▶ Important features includes
  - Indus estuary and sedimentation
  - Monsoon and climatic change
  - Makran subduction Margin

# Subduction Zone along Makran Coast and Emergence of Islets

- ▶ Makran coastal belt lies over a subduction zone
- ▶ Tectonic activity in the area, usually results sudden emergence of islets
- ▶ Repeated events of islets emergence have been recorded in the past













# Emergence of Islet/ Island/ Mud Volcano

**SUDDEN APPEARANCE OF ISLET**





**Dim 220 X 150 X 15m**



**Views of Malan Island – 2010**





# Emergence of Islet/ Island/ Mud Volcano



September  
2013







300 feet above sea level.  
World's highest active mud volcano, **Chander Gup**,  
Hingol National Park, Balochistan-Pakistan  
Photo by Asif Khan - 06th December 2009





An aerial photograph of a sand volcano in a desert. The volcano is a conical mound of sand with a dark, circular crater at the top. The surrounding landscape is flat, sandy, and sparsely vegetated. The lighting creates long shadows, highlighting the texture of the sand.

**Offshore emergence of such islets  
poses great challenges to hydrography**



# PNHD COMPONENTS

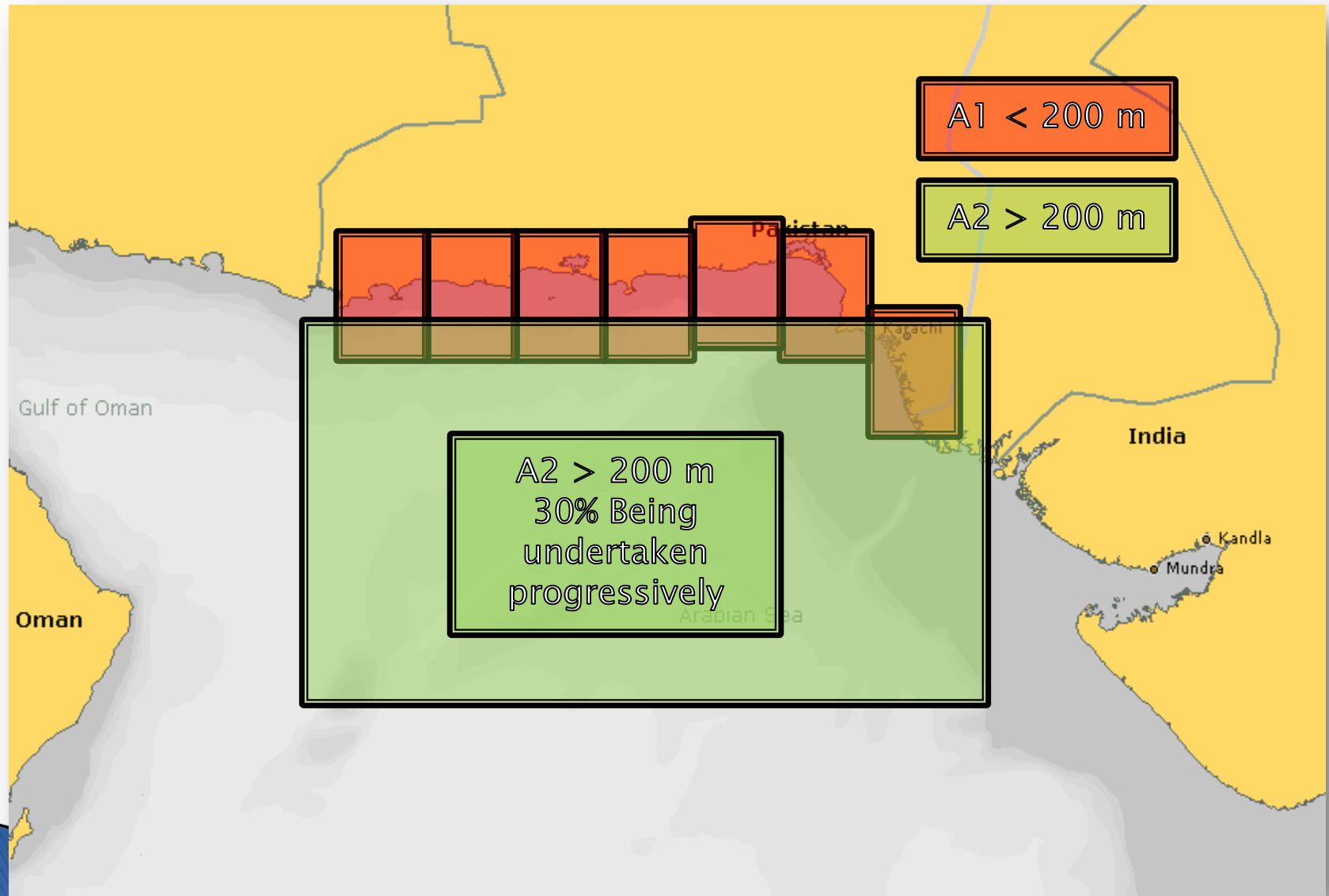
- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>■ Hydrographic Office (Karachi)</li><li>■ Cartographic Section</li><li>■ ENC Division</li><li>■ HQ Navarea-IX</li><li>■ PN Chart Depot</li><li>■ Dredging Wing</li></ul> | <ul style="list-style-type: none"><li>■ Meteorology Cell</li><li>■ NHDB</li><li>■ Survey Vessel &amp; SMBs</li><li>■ Dredging Vessel</li><li>■ Hydrographic School</li><li>■ Hydrographic Dte</li></ul> |
|--|---|

# HYDROGRAPHIC SUREVYS

- ▶ SV BEHR PAIMA carried out survey of entire Pakistan Coast along-with 2 SMBs



# PROGRESS OF HYDROGRAPHIC SURVEYING



# ENC DIVISION

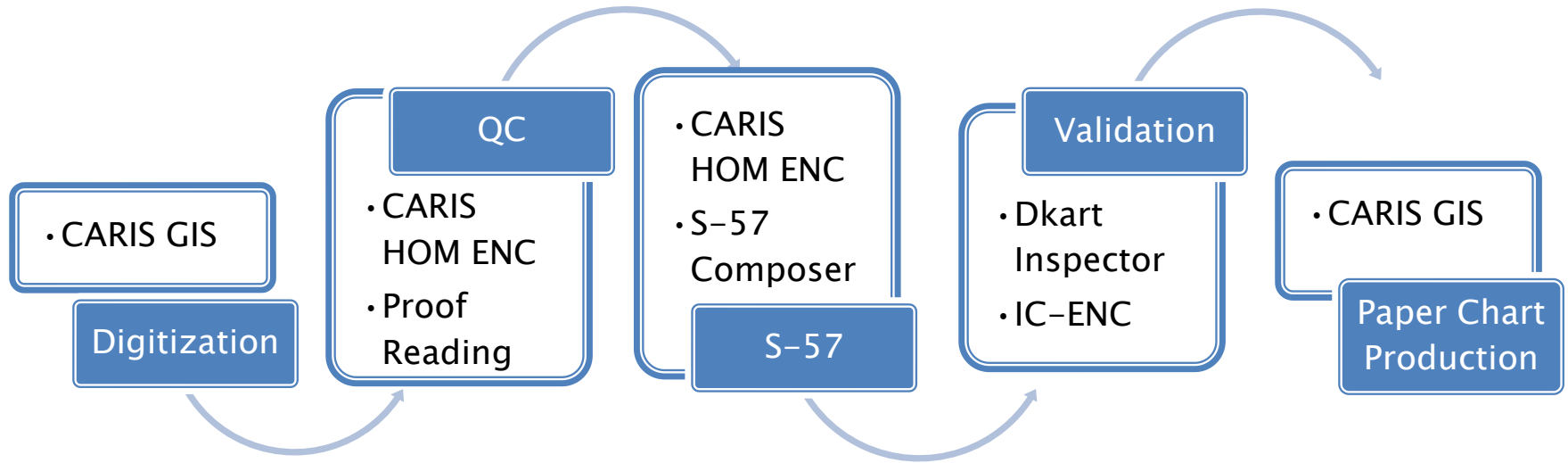
- ENC Division was established in 2005
- 14 ENCs have been produced so far out of 41
  - ENCs of major ports, Approaches and major shipping routes are available
- ENCs validated through IC-ENC prior dissemination

# ENC DIVISION

- 4 new editions and updates of existing cells have been produced during last year
- Work is in progress on future plan which encompasses
  - Production of coastal navigation band ENCs
  - New Editions and updates of existing ENCs



# ENC & PAPER CHART - PRODUCTION FLOW LINE



- Additional S-57 production system – ESCGS (Electronic Sea Chart Generation System)

# Common ENC of “AREA I and J”

- 3 ENCs of INT series Charts have been prepared which are common in region “I” and “J” of S-11 (mainly in Area I)
- Such ENCs requires “M\_COVR” object finalization

# HQ NAVAREA IX at PNHD – MSIs

Pakistan is a Coordinator of NAVAREA IX since 1976

**NAVAREA IX consists of these 16 countries**



- **Bahrain**
  - **Djibouti**
  - **Egypt**
  - **Ethiopia**
  - **Iran**
  - **Iraq**
  - **Jordan**
  - **Kuwait**
  - **Oman**
  - **Pakistan**
  - **Qatar**
  - **Saudi Arabia**
  - **Somalia**
  - **Sudan**
  - **UAE**
  - **Yemen**
- NAVAREA IX warnings promulgated through International Safety Net

# CAPACITY BUILDING

- Assistance to regional countries:
  - Hydrographic surveys
  - Geodetic and bathymetric data processing / production of charts
  - Basic Survey Recorder / Technician Course
  - ENC production line procedures and quality management system
  - Handling of MSIs

# CAPACITY BUILDING

<b>COUNTRY</b>	<b>YEAR</b>	<b>COURSE NAME</b>
Sri Lanka	2009	Basic Hydrography Course
UAE	2009	
Sri Lanka	2009	Basic Cartographic Officers Course
Bangladesh	2009	Basic Hydrography Course
Sudan	2010	
Sudan	2010	Basic Hydrography Officers Course
Sri Lanka	2010	
Nigeria	2010	
Bangladesh	2010	
Azerbaijan	2011	
Sri Lanka	2012	Basic Cartographic Officers Course
Sudan	2012	
Sri Lanka	2013	Basic Cartographic Officers Course
Bangladesh	2013	
Sudan	2013	
Pakistan	2013	CAT 'B' Course on Hydrographic Survey



# OCEANOGRAPHIC ACTIVITIES

- ▶ Oceanographic activities conducted with National Institute of Oceanography
- ▶ Joint Oceanographic cruises are arranged for data collection
- ▶ In addition, PNHD also undertake research cruises for university students

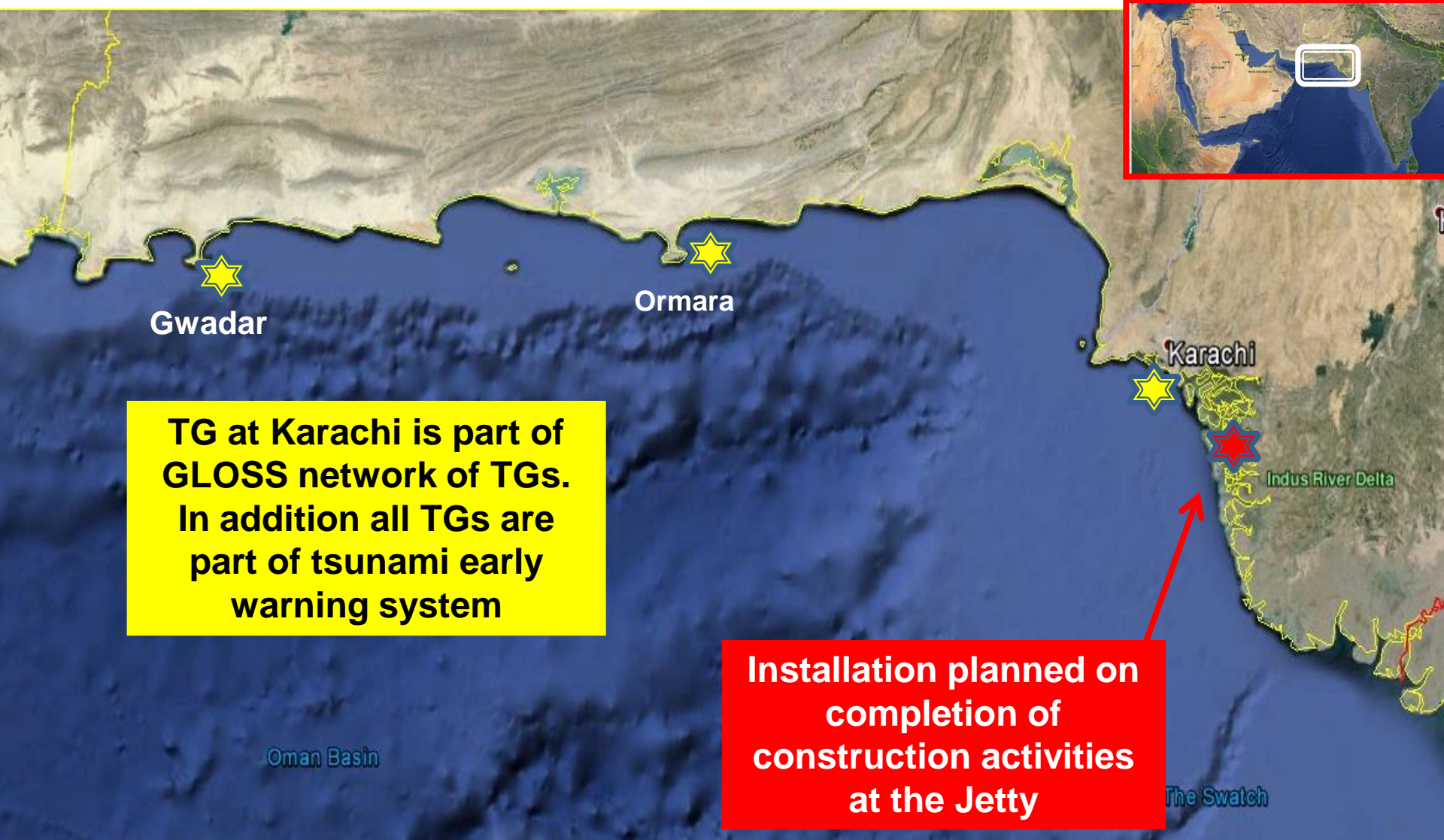
# OCEANOGRAPHIC ACTIVITIES

## ▶ TIDE GAUGE NETWORK

- Work on national network of automatic tide gauges is in progress
- Four satellite tide gauges are installed at various locations



# Tide Gauges Network along the Coast



# Tide Gauge at Karachi



## SEA LEVEL STATION MONITORING FACILITY

Intro

Map

Station lists

Station details

Services

[previous station] Station  at GMT [next station]

[more details]

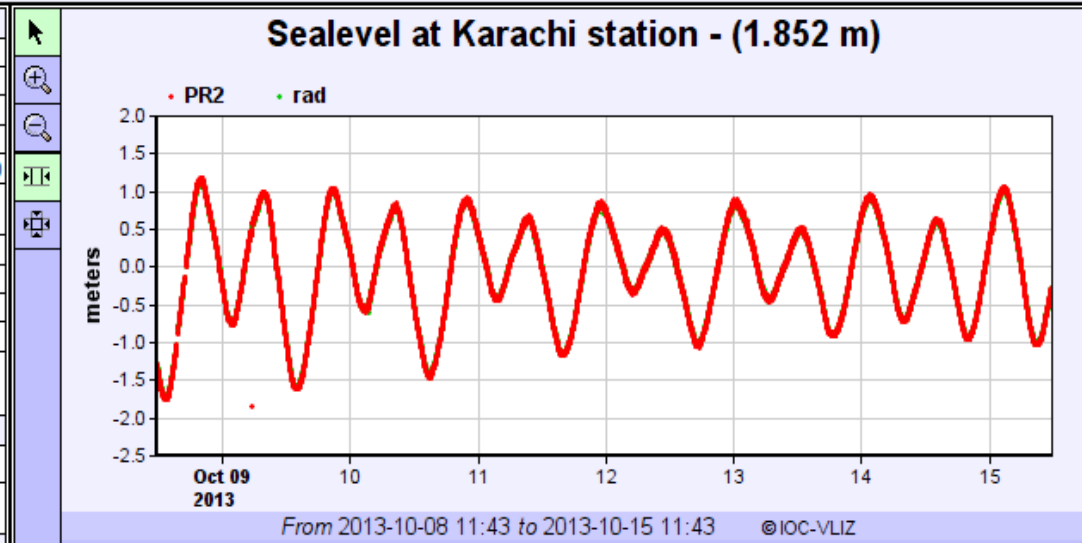
[GTS message]

[show data]

[show on map]

[monitor]

Station metadata	
Code	kara
Country	Pakistan
Location	Karachi
Status	Operational
Local Contact	Karachi Port Trust ( Pakistan )
Other Contact	Pakistan Navy Hydrographic Department ( Pakistan )
GLOSS ID	30 <a href="#">[goto handbook]</a>
Latitude	24.8117
Longitude	66.975
Connection	GTS message
GTS message type	SXXX33
Sensor 1	
Type of sensor	rad
Sampling rate (min)	1
Sensor 2	
Type of sensor	pr1
Sampling rate (min)	1
Sensor 3	
Type of sensor	PR2
Sampling rate (min)	1



Period	Signals	Data
<input type="text" value=""/>	<input checked="" type="checkbox"/> rad	<input checked="" type="radio"/> Relative levels= signal - average over selected period
<input type="radio"/> 12h	<input type="checkbox"/> pr1	<input type="radio"/> Absolute levels= as received
<input type="radio"/> day	<input checked="" type="checkbox"/> PR2	<input type="radio"/> Offset signals= relative signals + offset
<input checked="" type="radio"/> 7 days	<input type="checkbox"/> Remove outliers	
<input type="radio"/> 30 days	<input type="checkbox"/> Remove spikes	

Tip: use left icons to zoom & scroll

# Considerations for NIOHC

- Mid and advance level CB in hydrography and Oceanography required for better QA of hydrographic products
- Overlapping INT-ENCs (M\_COVR object) of adjacent countries require settlement prior finalization



**THANK YOU**