



# Hydrographic Department, Royal Thai Navy : Tsunami response



# Outline

1. Background of the Scenario
2. Objective
3. Hydrographic survey
  - 3.1 Planning
  - 3.2 Equipment and platforms
  - 3.3 Output



# Outline

## 4. Real time tidal observation

### 4.1 Planning

### 4.2 Equipment and platforms

### 4.3 Output

## 5. Aids to navigation

### 5.1 Planning

### 5.2 Equipment and platforms

### 5.3 Output



# Outline

6. Outcome

7. Lessons learnt / best practices

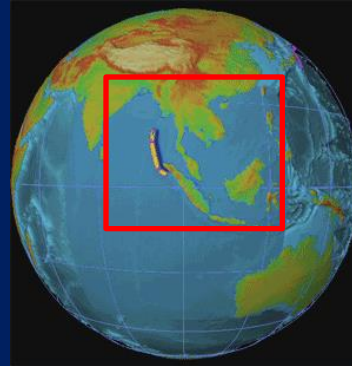
8. Conclusion and Recommendations



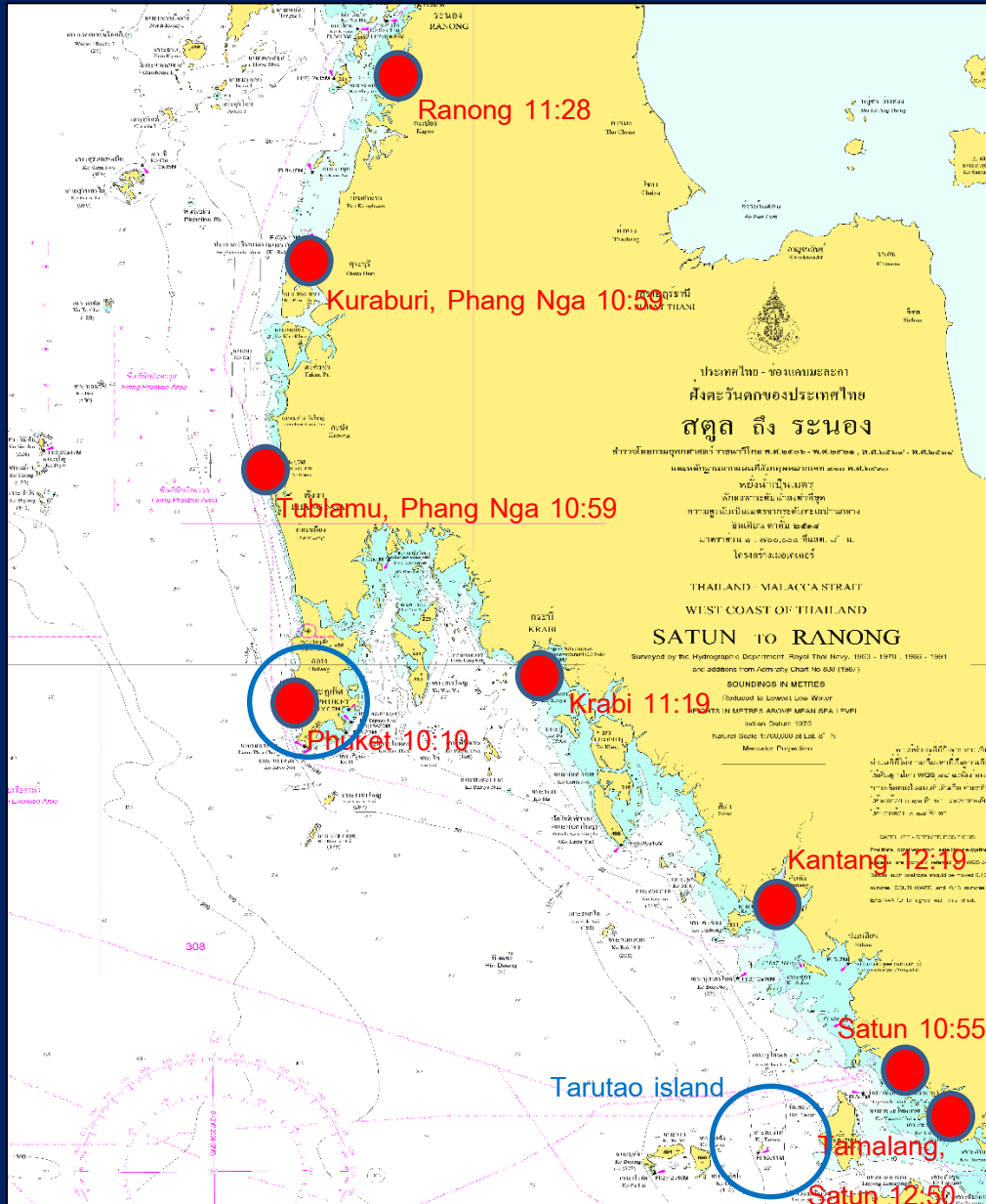


# 1. Background of the Scenario - Indian Ocean tsunami

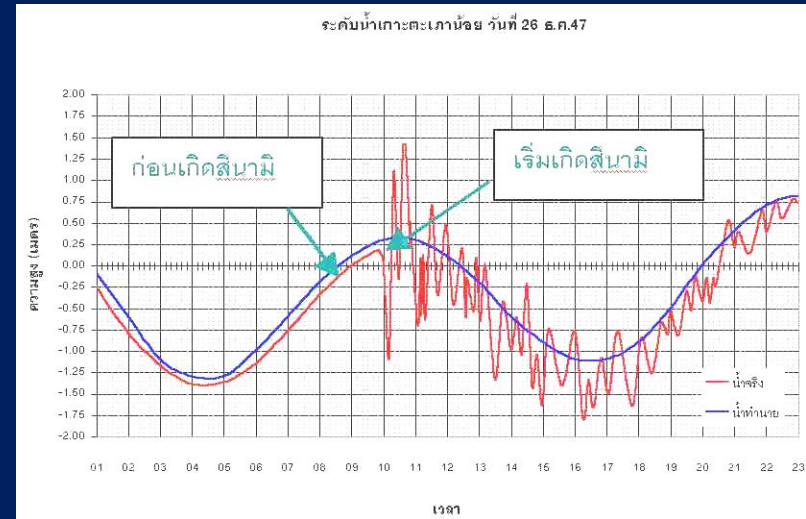
00:58 UTC (07:58 Local) 26 December 2004



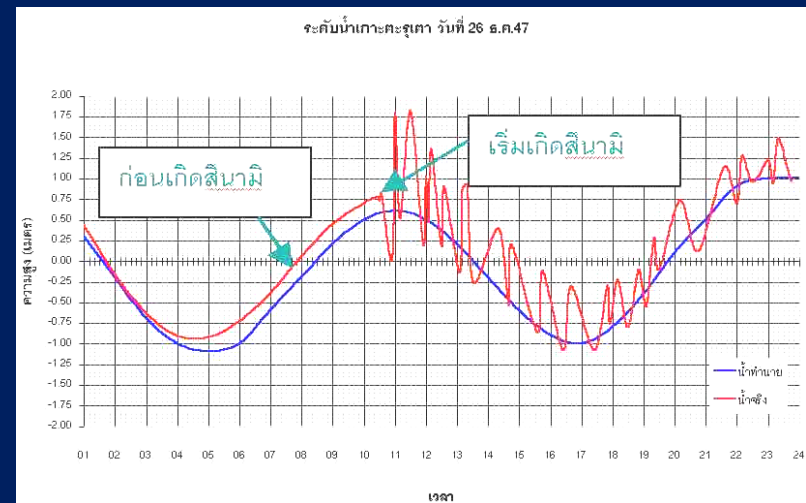
# Affected areas in Thailand



Tidal graph at Tapaonoi island station



Tidal graph at Tarutao island station





# Disaster

## Impact and debris



## Khao Lak, Phang-nga, Thailand



13 January 2003

26 December 2004

# Disaster relief and humanitarian aid





## 2. Objective

2.1 Navigation safety and port recovery within tsunami effected coastal areas;

2.2 Hydrographic information updating for update charts and cartographic products;

2.3 Implementation real time tidal station to facilitate hydrographic survey and Tsunami forecasting systems;

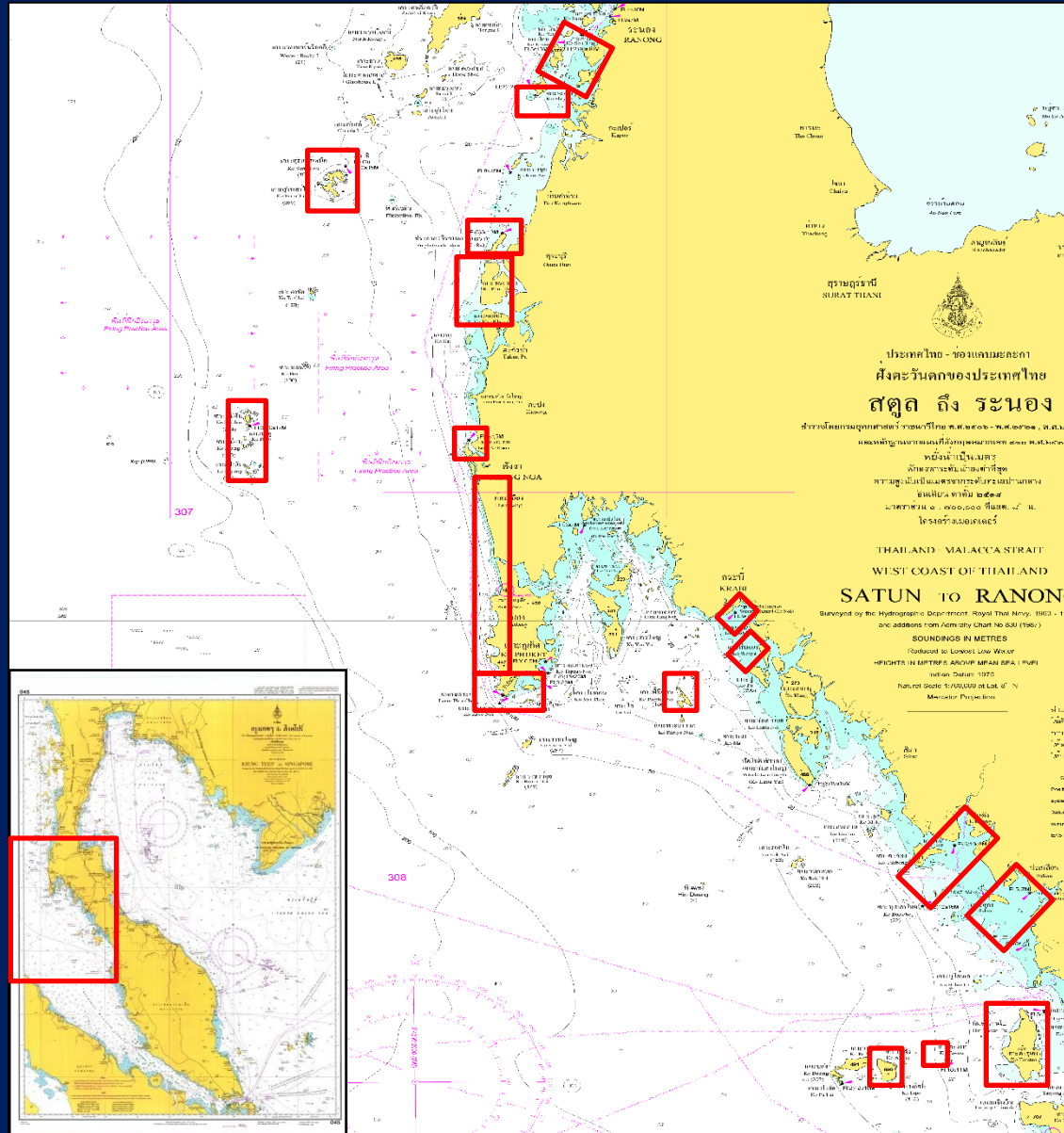
2.4 Recovery aids to navigation within affected areas;

2.5 Establishment of Hydro Disaster Warning Center



3. Hydrographic survey, real time tidal observation and aids to navigation

# 3.1 Planning (Hydrographic survey)



-Support navigation safety and port recovery response

-Support humanitarian response

-Support and facilitate natural disaster response /relief





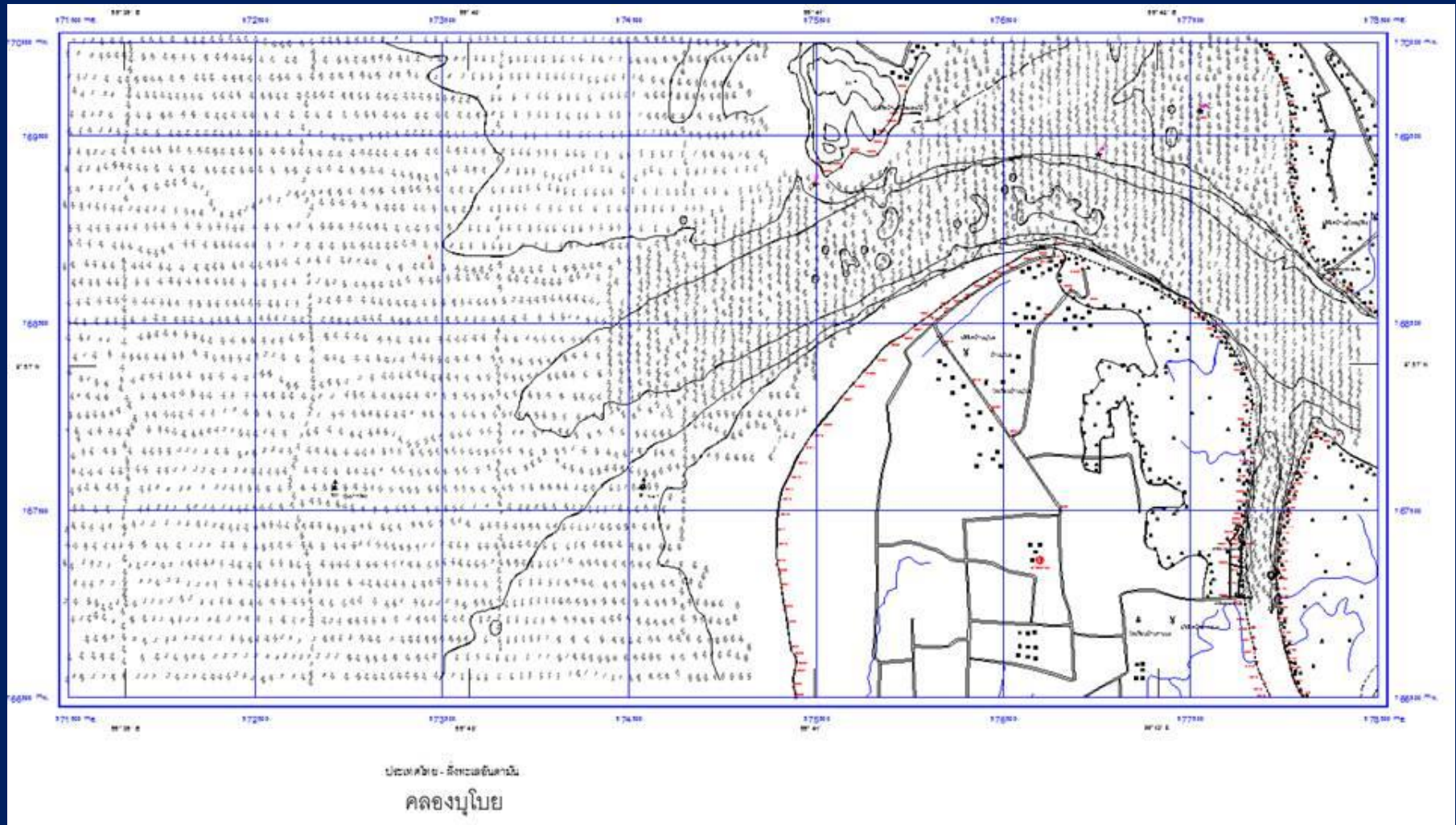
# 3.2 Equipment and platforms (Hydrographic survey)



## MBES L3 Elac Nautik seabean 1185

|                 |          |
|-----------------|----------|
| Made by         | Germany  |
| Frequency       | 180 kHz  |
| Beam            | 126      |
| Accuracy        | 1.25 cm. |
| Max.Depth       | 300 m.   |
| Max Swath Width | 150      |

# 3.3 Output (Hydrographic survey)

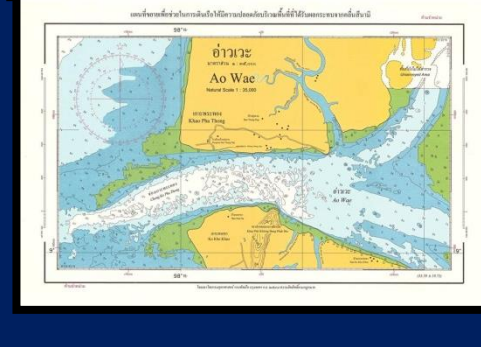
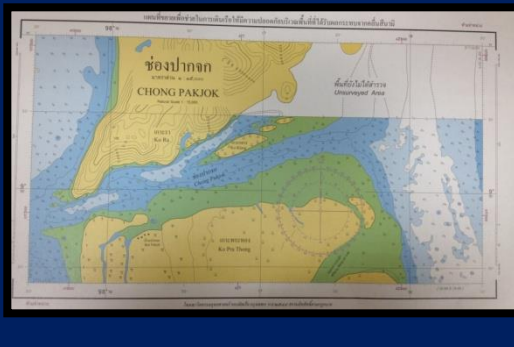
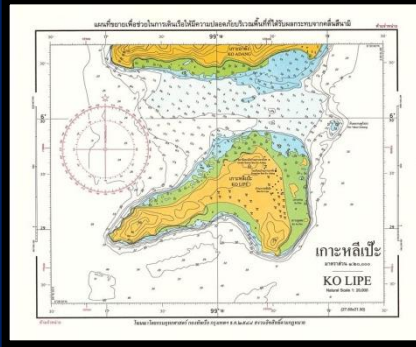
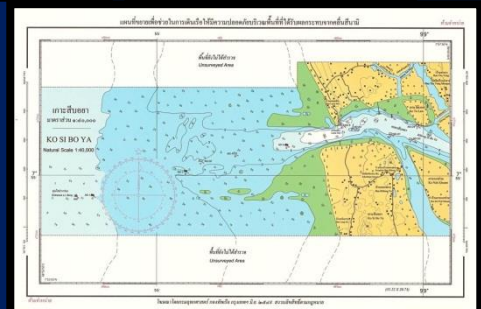
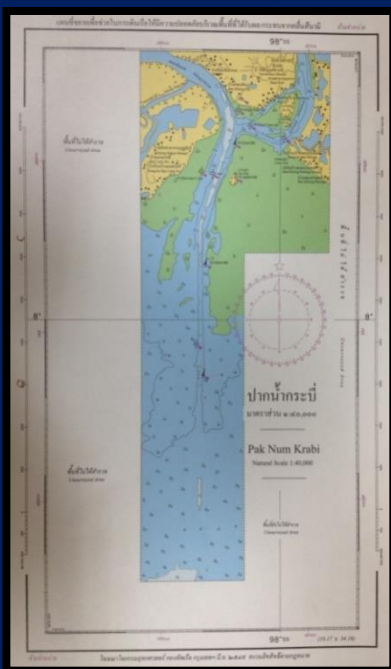
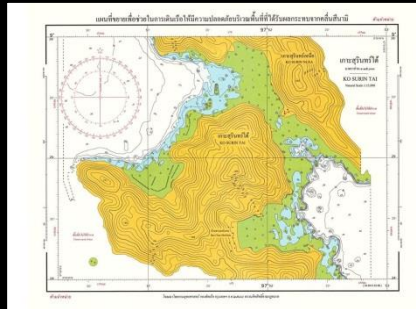
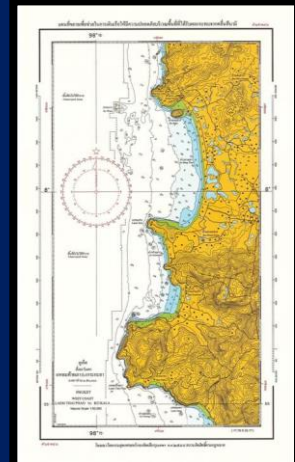
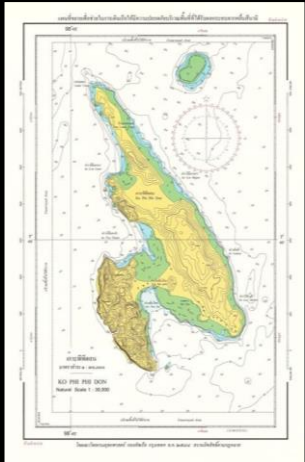




# 3.3 Output (Hydrographic survey)

## Humanitarian response

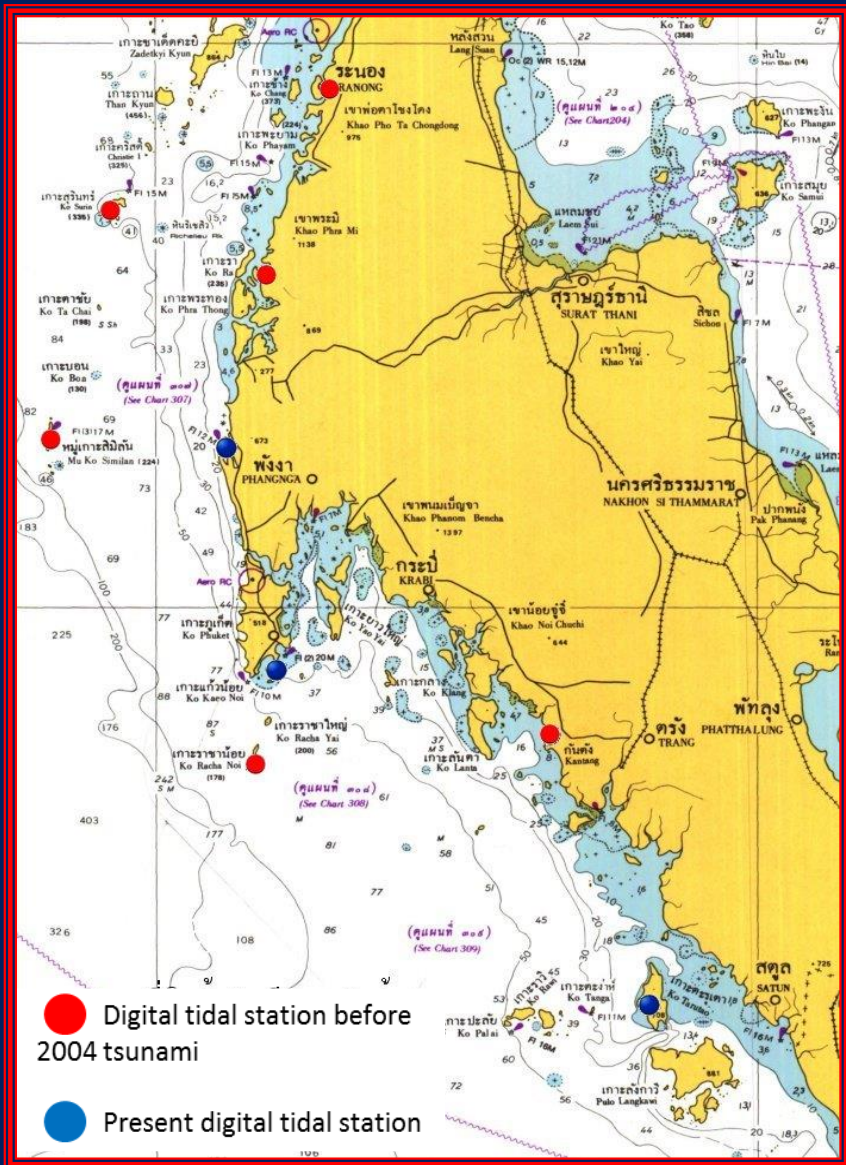
## Navigation safety and port recovery response





## 4. Real time tidal observation

# 4.1 Planning (Real time tidal observation)



- Support navigation safety and port recovery response
- Support humanitarian response
- Support and facilitate natural disaster response /relief



## 4.2 Equipment and platforms (Real time tidal observation)

### Measurement and Recorder



Antenna

Radio  
Transponder

Control Panel  
& Recorder

Pressure Sensor



### Receiver and Display

Antenna Receiver

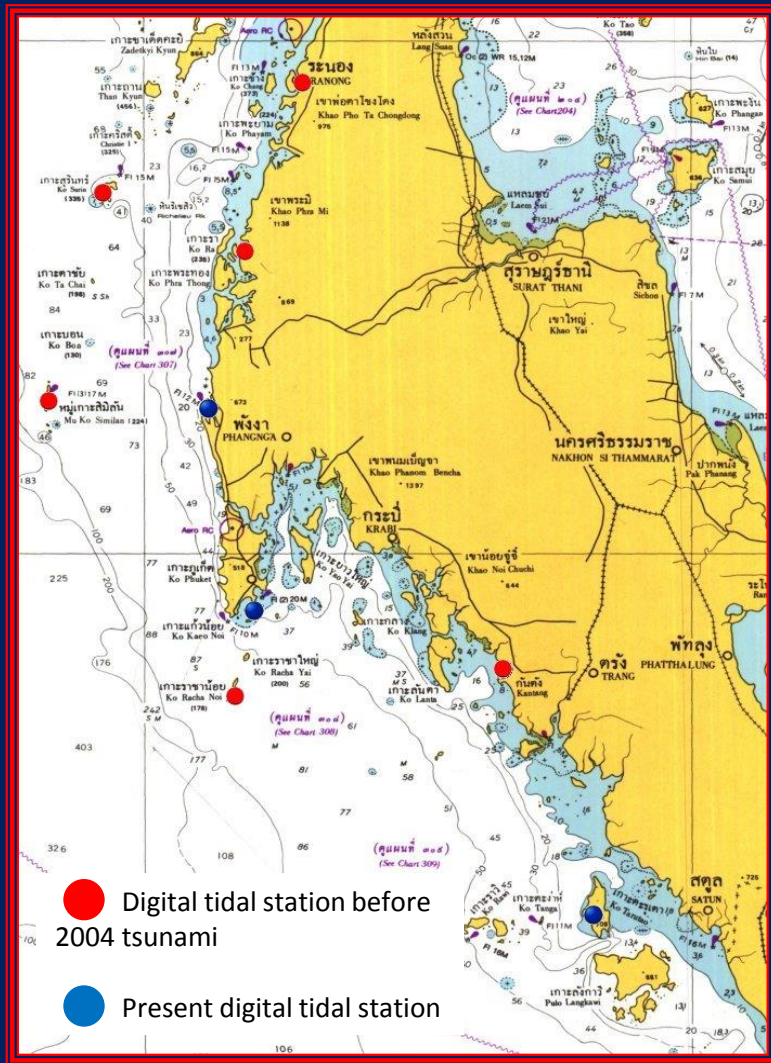
Radio  
Receiver

Monitor

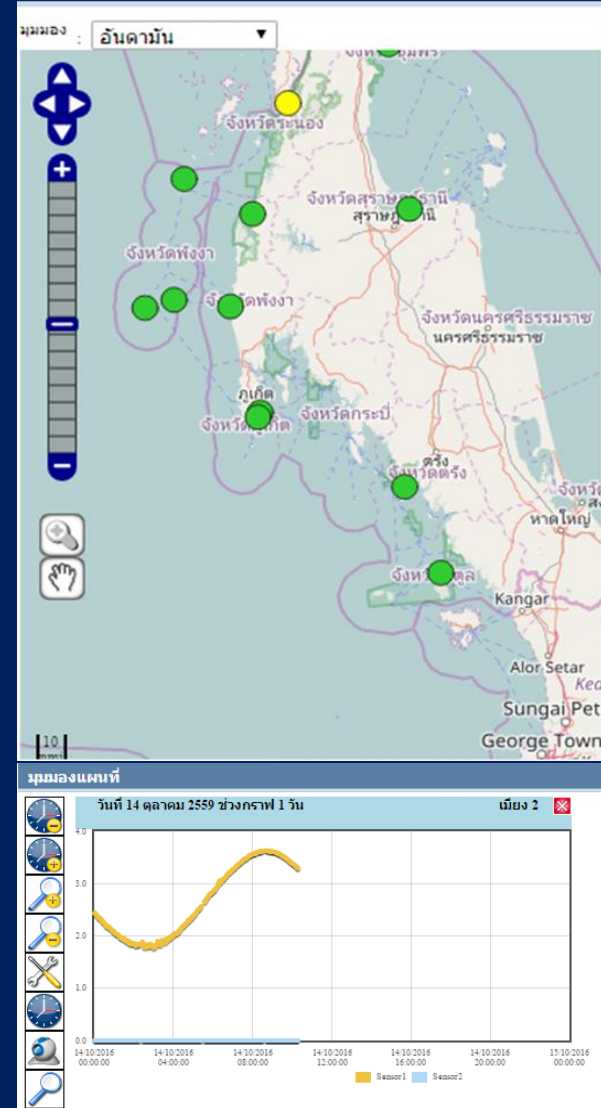




# 4.3 Output (Real time tidal observation)



Digital tidal station before 2004



Present digital tidal stations

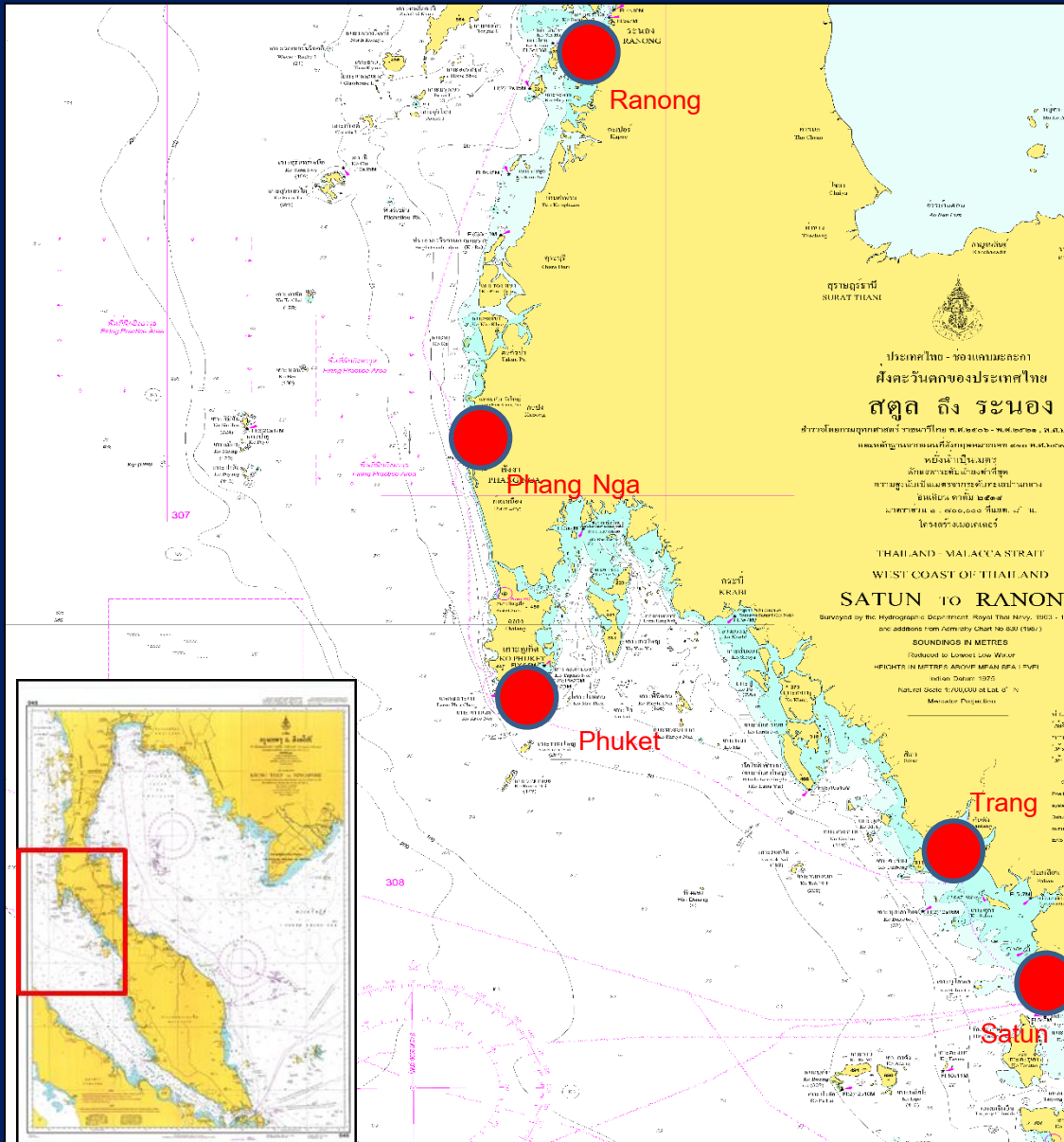




## 5. Aids to navigation



# 5.1 Planning (Aids to navigation)



Recovery aids to navigation within affected areas

- Ranong
- Phang-nga
- Phuket
- Trang
- Satun

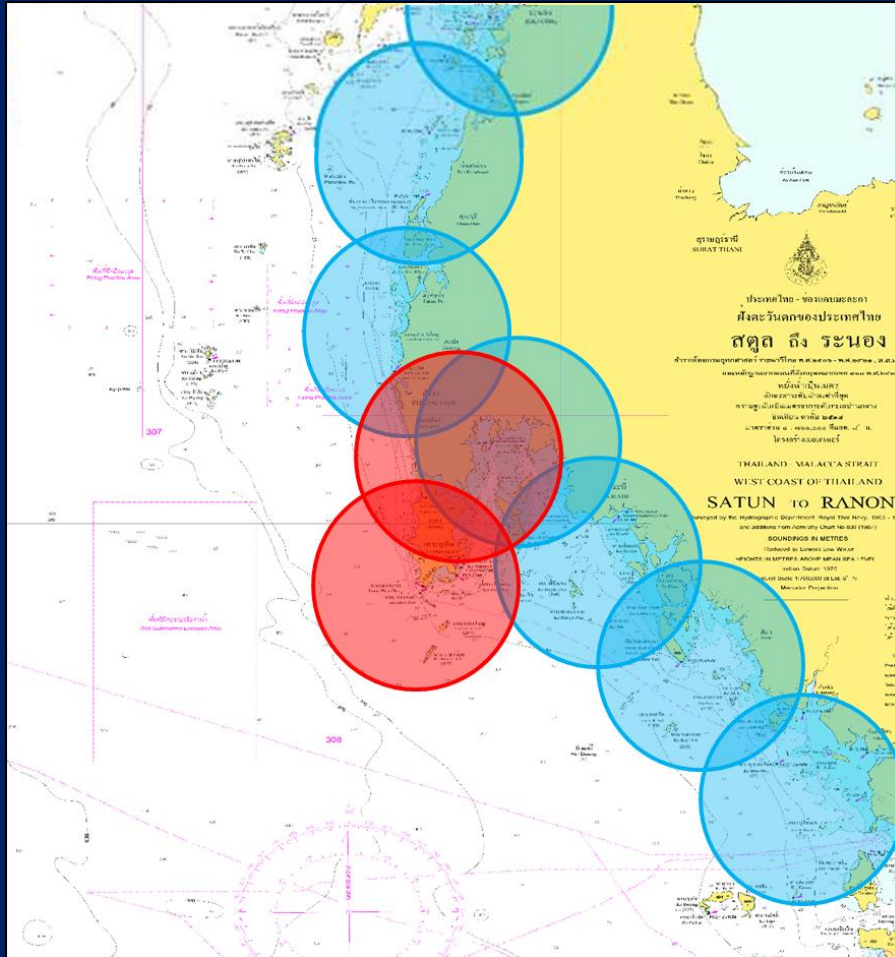


## 5.2 Equipment and platforms (Aids to navigation)





# 5.3 Output (Aids to navigation)



-Recovered aids to navigation

- Andaman sea AIS network:

2 Repeater sites

7 Remote Sites





# 6. Outcome

6.1 Timely charts for SAR and support natural disaster response

(reduce compilation time and improve working process)

6.2 Coverage of tidal stations, and utilization for monitoring and

prediction

6.3 Navigational Aids' recovery

6.4 Utilization of existing aids to navigation for broadcasting warning

message system



# 7. Lessons learnt/best practices

7.1 Access to affected areas very important (suitable platform/vessel to entrance to navigable water, channel and port)

7.2 Acceptability of IHO standard for charts (High quality standard VS the need of chart to support tsunami response)

7.3 Size and number of surveying teams

7.4 Mobility of the surveying platform and equipment

7.5 Portable chart printer



## 8. Conclusion and Recommendations

### Before tsunami impact

- Tsunami monitoring and prediction system are vital for tsunami warning and evacuation.
- Well-organized communication channel and broadcast.
- Evacuation plan and practice.

### After tsunami impact

- Readiness of surveyors, equipment and platforms.
- Reduce chart compilation time and process.





*Thank you*

