

International Tsunameter Partnership

Report to DBCP-26, Oban 2010

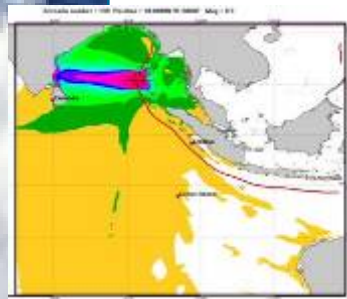


Ken Jarrott, Chair – ITP
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27 Sep 10

DBC-26, Oban

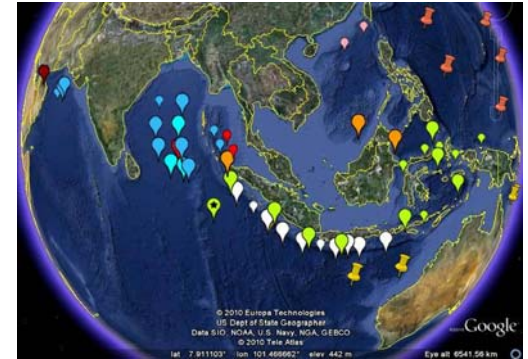
Sea Level Observations – Stages



Threat Appraisal

**Tsunami
Development &
Manufacture**

(Obs. Net. Design)

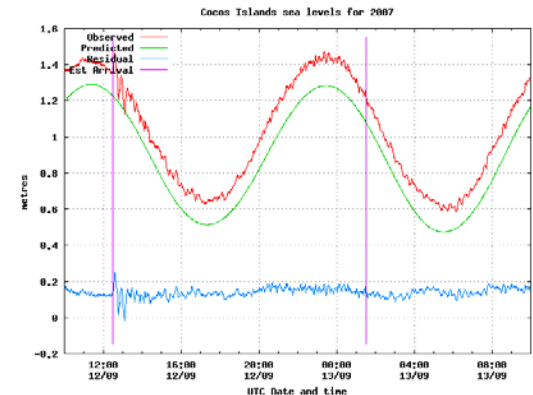


**Coastal and Deep Ocean
Network Establishment**

Operating and Sustaining

**Timely Data Exchange to
Agreed or Common Standards**

**Data Management
and Data / Metadata
Repositories**



The Last Year

■ Meetings

- April '10 – informal meeting of members of IOTWS Working Group 2 (Sea Level Data Collection and Exchange) – [Banda Aceh, Indonesia](#)
- [ITP-6 meeting to be held immediately following DBCP - Oban](#)



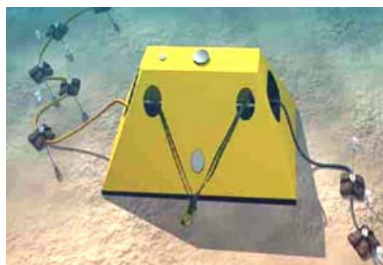
■ Product Developments (not all)

- Indian tsunameters re-configured for battery power (vandalism response)
- German GITEWS tsunameters with bottom pressure manufactured
- First commercial ETD DART produced by SAIC
- Cabled systems developed for Cyprus TWERC* – CSNet and others
* *Tsunami Warning and Early Response system for Cyprus*

Tsunameter Equipment Types (some)

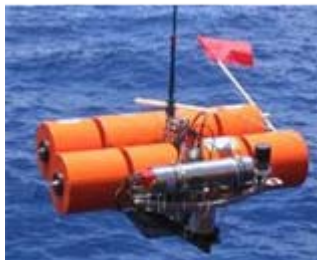


Surface Buoys



Ocean Floor Cabled Nodes

Ocean Bottom Units

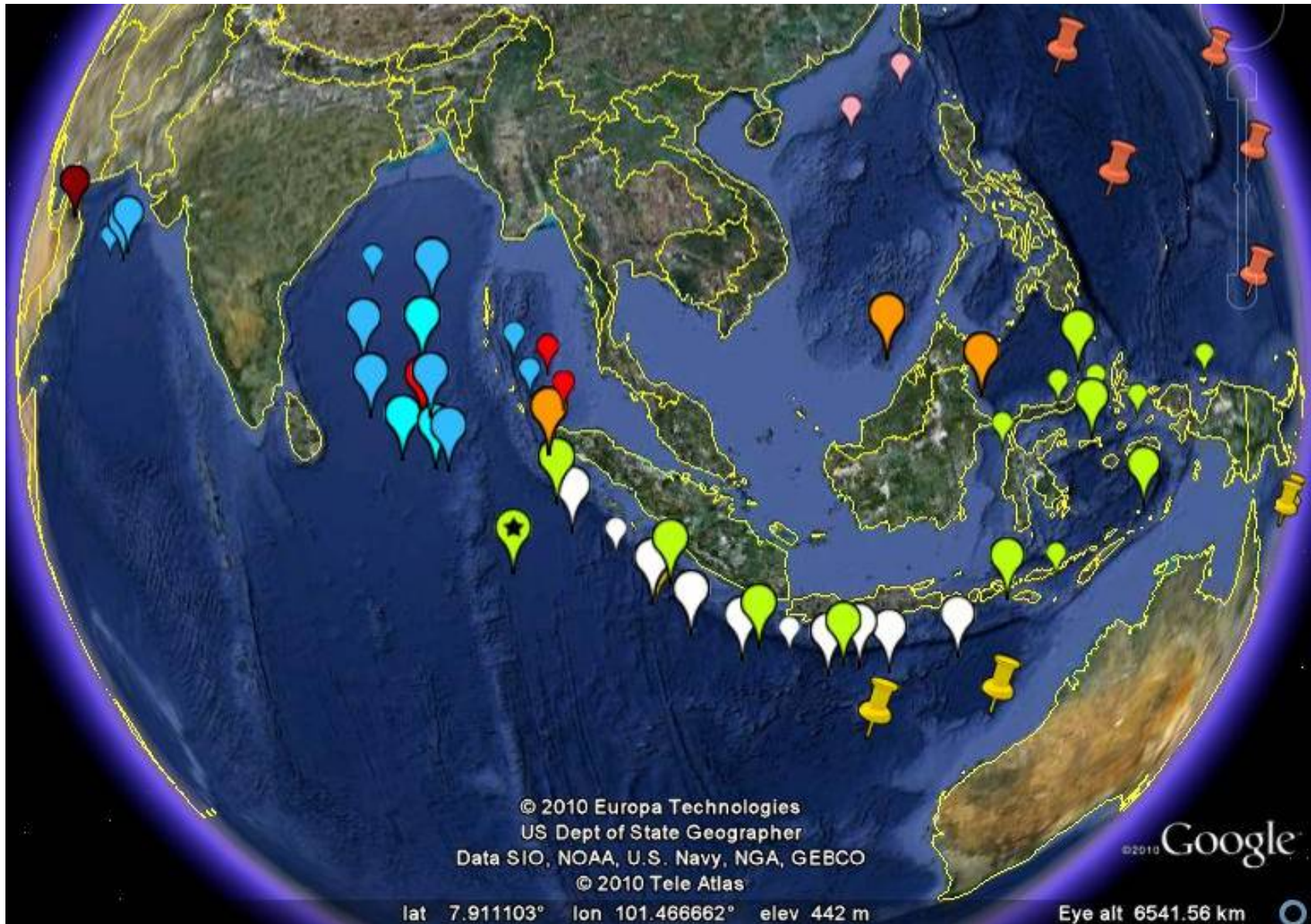


The Last Year

■ Network Establishment

- **Indian** network augmented with SAIC STB (another planned), and being re-seeded with updated Indian tsunameters (solar power)
- **Malaysia** deployed 3rd (final) station
- **Indonesia** - 4 new stations deployed
- **Australia** deployed 7th station (experimental ETD in Fiji Basin), with joint Indonesian trial ETD deployment planned by end 2010
- **Cyprus** TWERC ocean observing nodes (4) in place (pre-operational), Sep 10
- **Chinese** stations (2) - at or near deployment stage
- **Russian** station (1) deployment imminent
- **Thailand** to deploy (final) 2 stations by Dec 2010.

Networks being Established by Indian Ocean TWS



27 Sep 10

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Dual Use Cabled Systems - Oman and Cyprus



Dual-Use Cabled Systems – Oman and Cyprus

Country: CYPRUS
Local Station ID: N-4
WMO ID:
Agency: Cyprus Oceanography Center
Latest Update: 23/09/2010
Regional Tsunami Warning Network Membership: NEAMTWS

Location

Latitude (N)	Longitude (E)	Depth (m)
33 04.4869	32 16.0185	1560

Deployed

Test/Trial/Pre-operational	Operational- Local Real Time Data	Operational - Global Real Time Data
Pre-Operational	15-Jan-11	

Station Details

Tsunamieter Type (Supplier / Model)	CSnet Offshore Communications Backbone (OCB) - Sonardyne
Sea Level Sensor	sub-bottom broadband seismometer, differential pressure gauge, absolute pressure sensor (Paroscientific)

International Data Access

Non-GTS Data Access Means	Description
Data is sent to Network Op Cntr via satellite; distributed via internet	The data uses a modified Antelope script to view sensor traces

GTS Transmission Header	Description

lat 23.717990° lon 45.322314° elev 346 m
 Eye alt 2354.95 km

Status of DART Components of TWS Networks



- ◆ Stations with recent data
- ◆ Stations with historical data only
- ◆ Stations with no data in last 8 hours

50 Tsunami stations deployed
43 have reported in the past 8 hours

SOURCE: NDBC Web Site: 26 Sep 10
www.ndbc.noaa.gov

The Last Year

■ Data Exchange

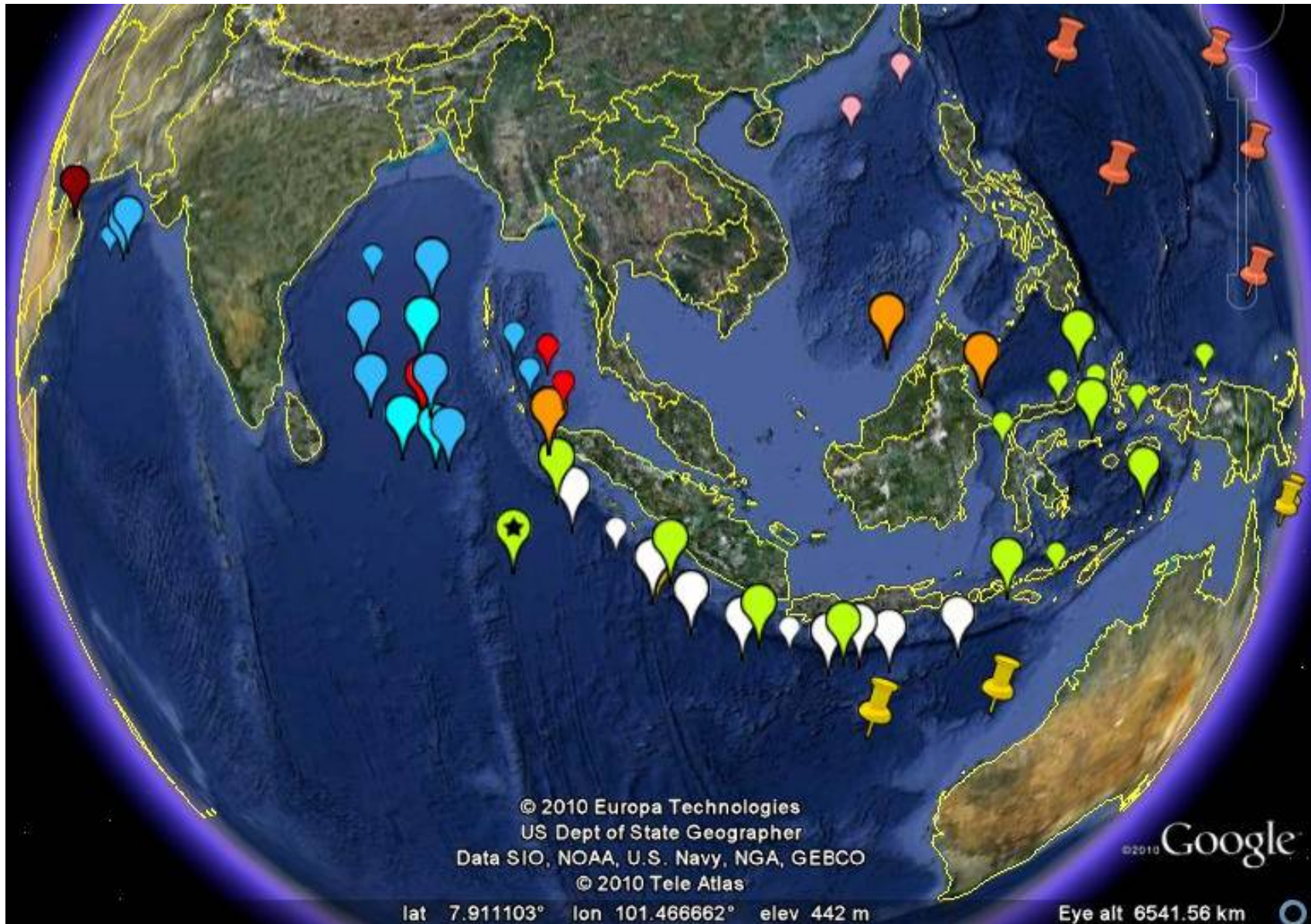
- All Australian stations delivering real time data on GTS in standard BUFR code
- All US-operated DART™, Thai STB delivering real time data on GTS, and via NDBC web site.
- Cyprus cabled system coding data in standard tsunameter code format
- SAIC has developed CREX coding for STB station – currently in trial
- India has developed BUFR coding of tsunameter sea level data – bilateral trial of GTS transmission underway with Australia
- German GITEWS GPS stations to explore data transmission via Uni of Flanders
- Oman considering data release from cabled system installed by Lighthouse R&D

BUT: No non-DART stations right now delivering real time data internationally in standard code forms

Operational Stations – Indian Ocean



Networks being Established by Indian Ocean TWS



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Operational Stations – Indian Ocean



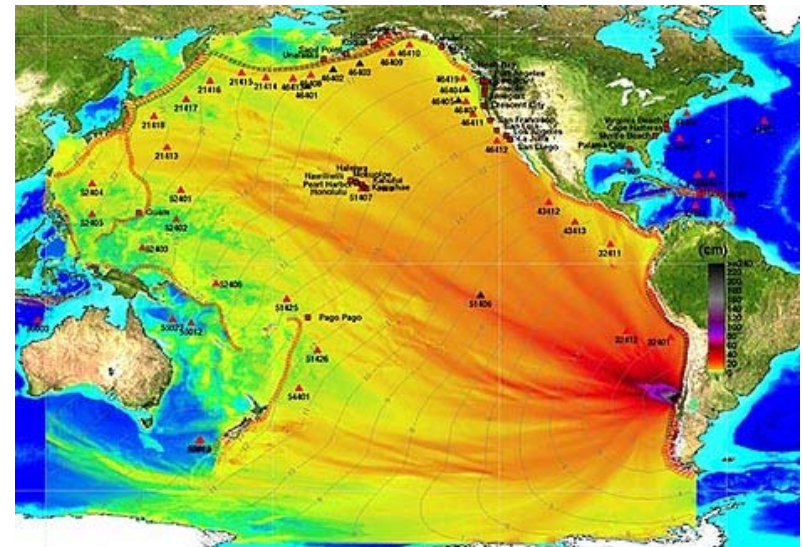
What Happens When it Matters?

Contribution to Tsunami Warning During Recent Events



Sumatra Event – April 2010 (small)

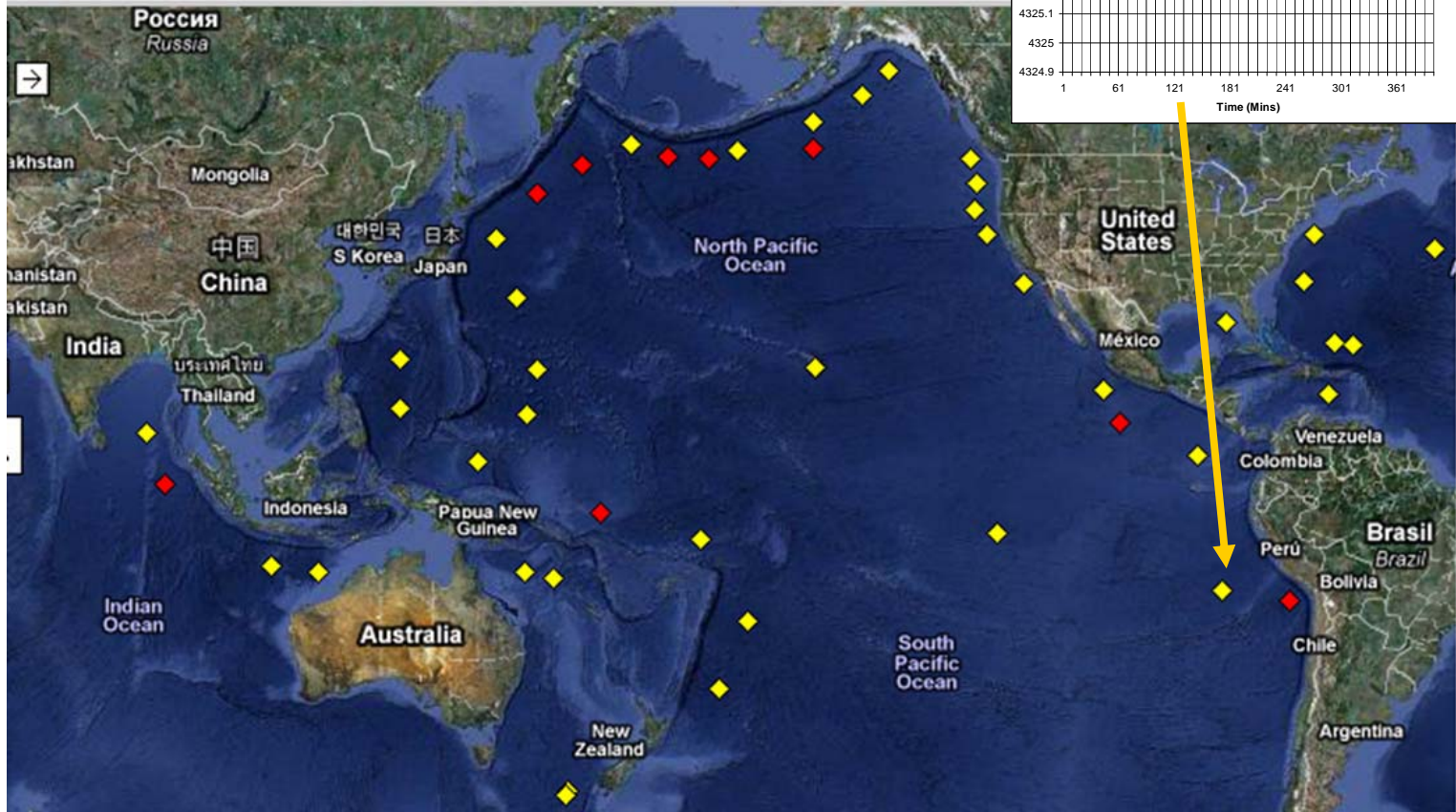
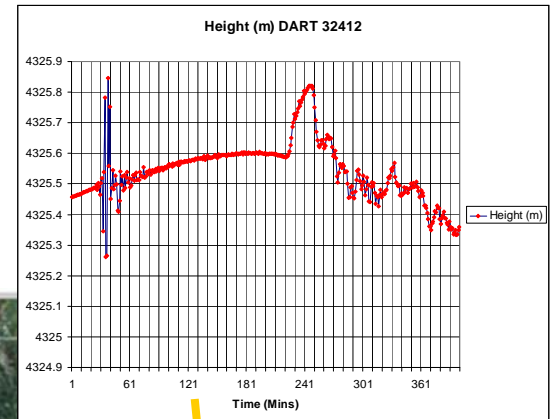
Chile Event – Feb 2010 (major)



Chile – 27 Feb 2010

Well observed by extensive Pacific Ocean tsunameter network and associated coastal (tide gauge) stations.

Nearest tsunameter not functional.



Network Readiness During Recent Event

Regional Sealevel Station Monitoring Facility

The displayed data is raw realtime data, and should not be used for operational services.

intro

gauge status

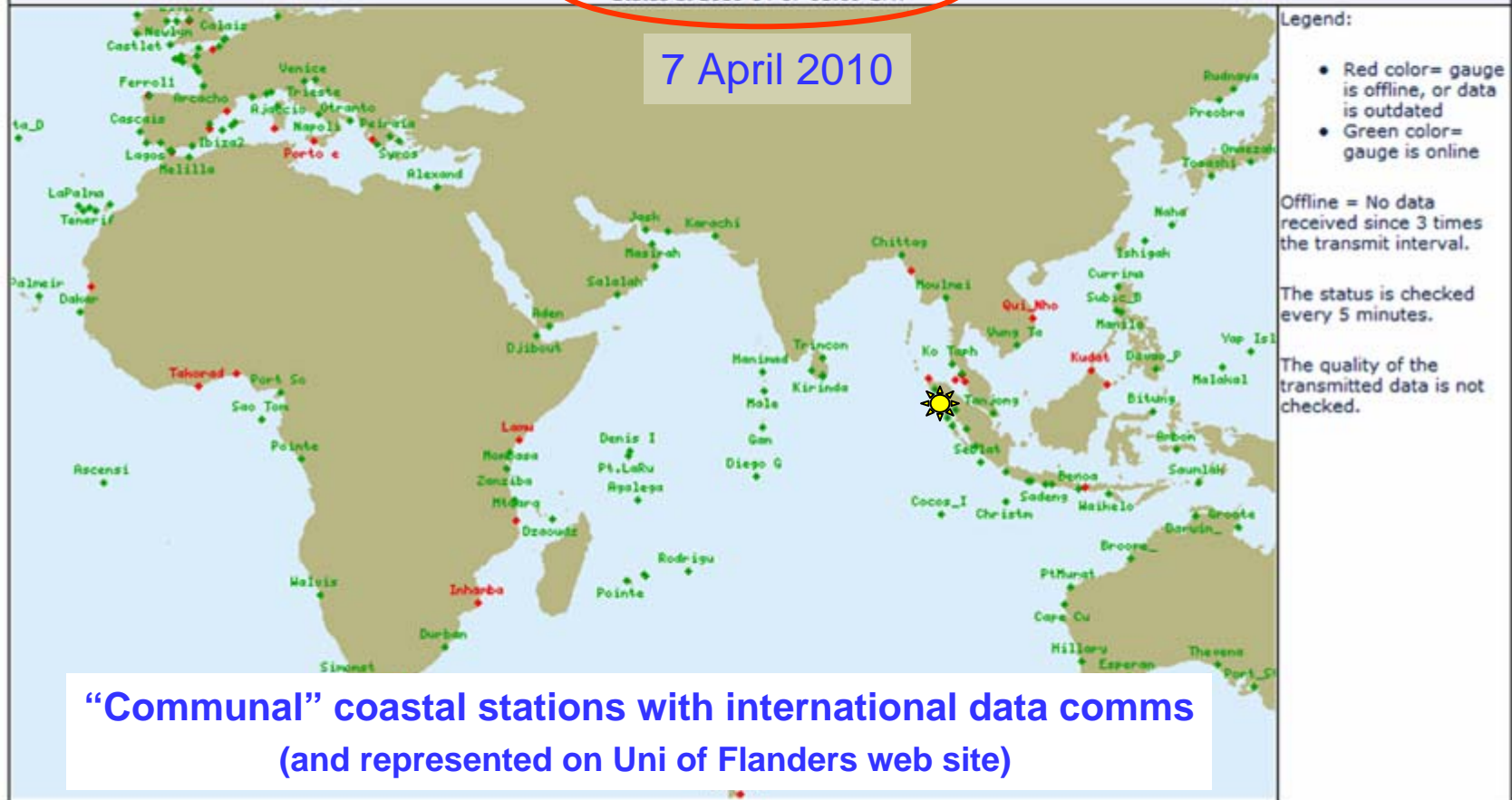
realtime data

database services

Sealevel stations

Status at 2010-04-07 01:09 GMT

7 April 2010

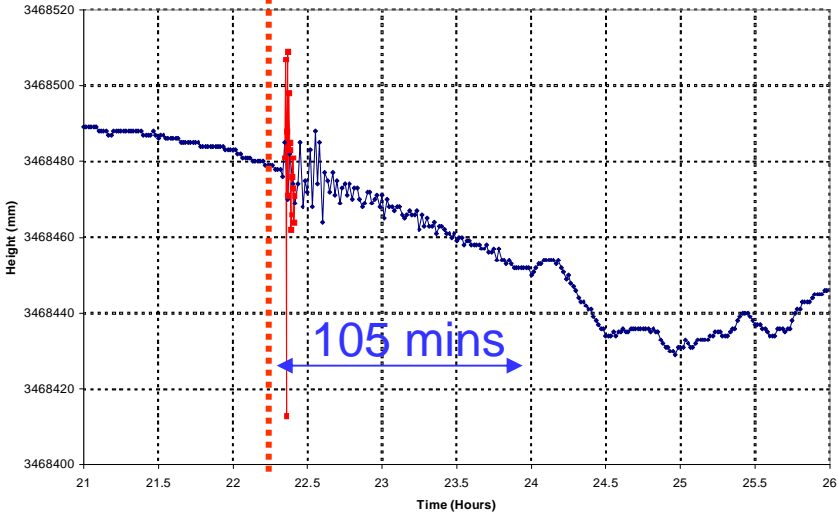


“Communal” coastal stations with international data comms
(and represented on Uni of Flanders web site)

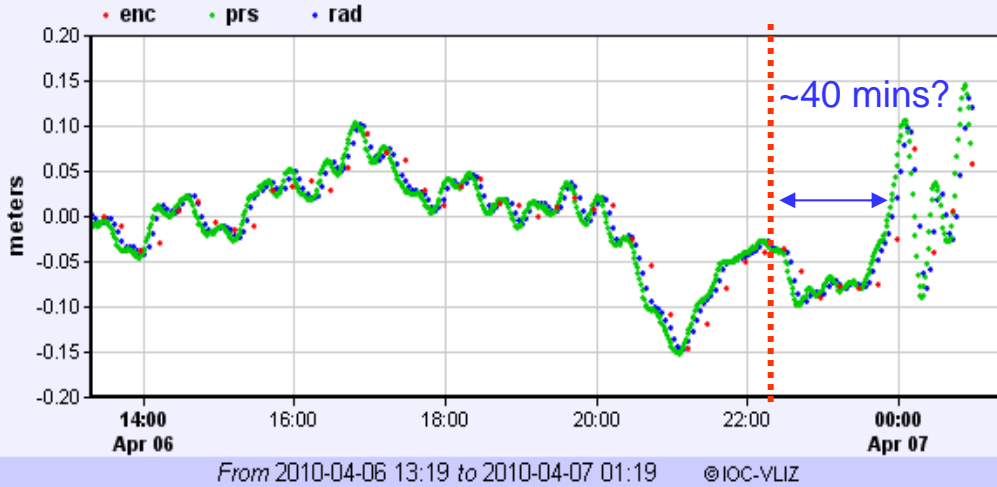
First Contact Stations

Thai STB Tsunameter Record

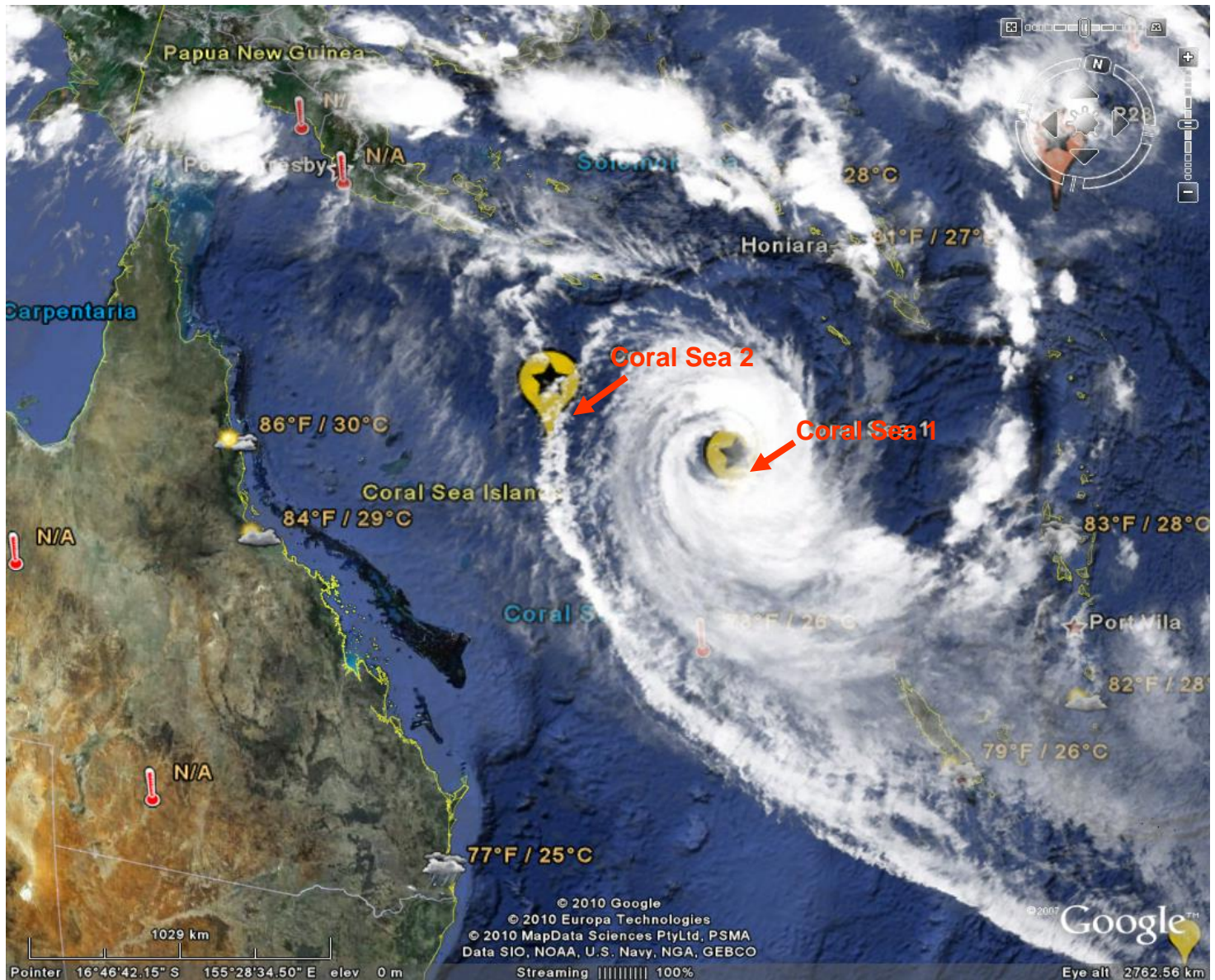
Thailand Event Apr 6 2010



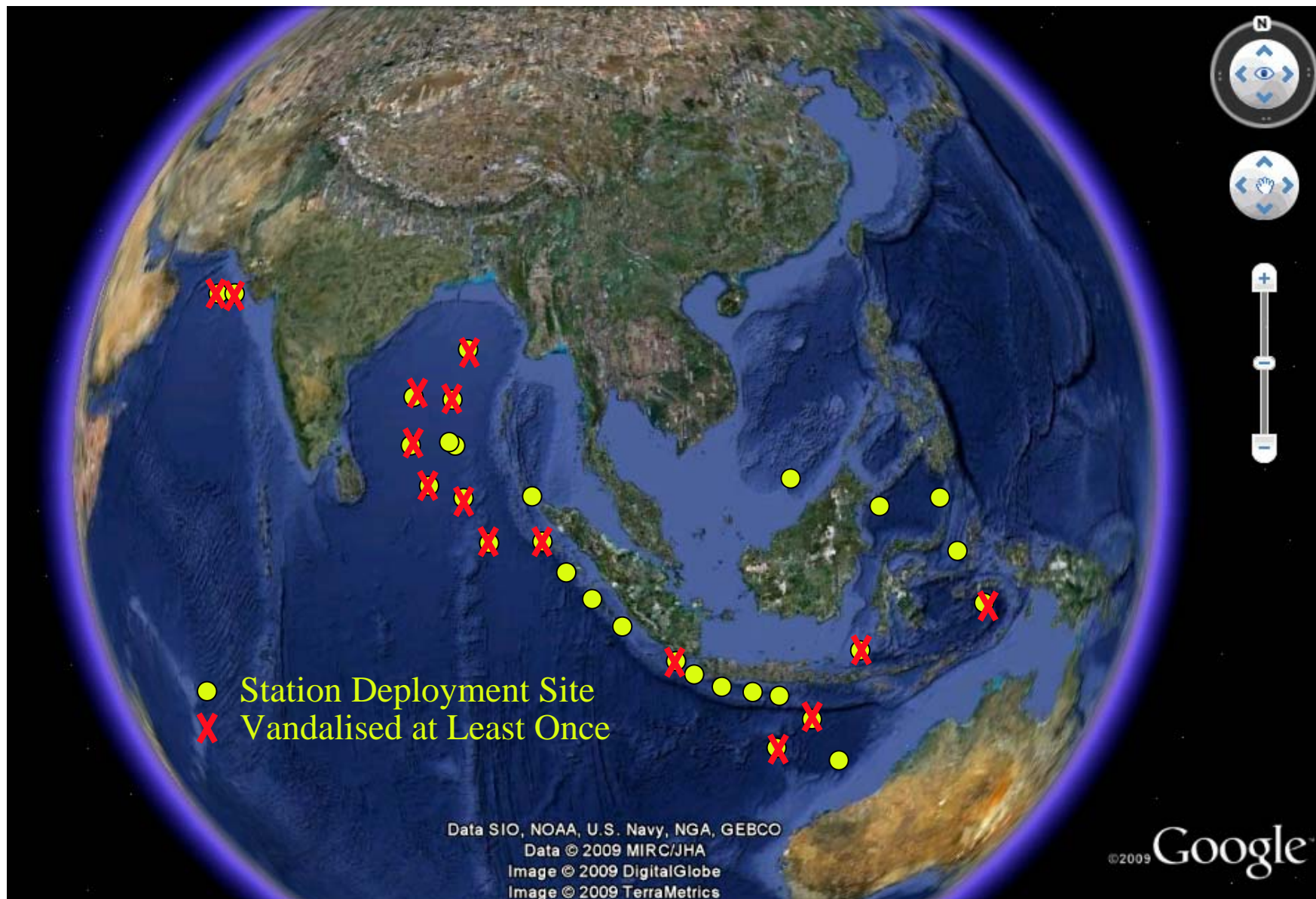
Sealevel at Sibolga station - (6.725 m)



“Stuff Happens” - Coral Sea Cyclone – 18 Mar 2010



“Stuff Happens” - IO Tsunameter Vandalism Incidents



The Journey – Where Are We?

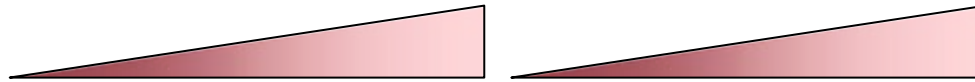
NOW

NEXT Very Soon!!

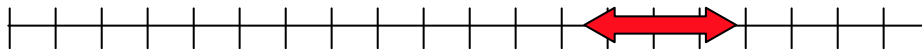
Delivering on Mission

Realising Potential

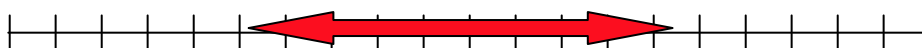
Sustaining the Mission



■ Deployments to Deliver Net Design ...



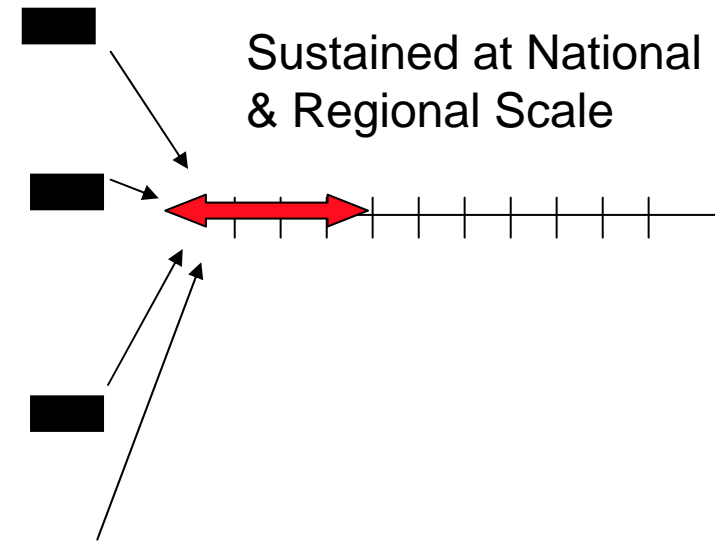
■ of Interoperable, Dependable Systems



■ that Deliver Real-time Data to Local Warn Centres that Know How to Use It



■ and Distribute that Data Globally, Quickly.



Where to From Here? – “technical”

- **Getting ALL technology & products to mature state** – best practice exchanges to reveal improvement & innovation targets; inter-comparison and system qualification practices. Establish best practice framework.
- **Sustainable (viable) and healthy global supply chains:**
 - **NOW** (excluding cabled systems): network plans for ~100 stations; 8 product variants; 4 commercial and 3 government-based R&D / product suppliers; active product R&D. High operating costs.
 - **2015+** what transitions / new linkages ?????
- **Data Exchange – Data Exchange – Data Exchange**
- **Warning Centres engagement in acceptance, data exchange, data interpretation**
- **Data and metadata repositories and visualisation tools**
- **Near-field tsunami detection** – ocean wave signal in seismic noise + , challenge of warning results for immediately threatened communities. Platform and processing technology; modelling science; warning interpretation.

Where to From Here? (2)

- **Vandalism and sustainability responses**
- **Communal collaboration facilities – web based**
- **Engagement with new countries and TWS's** - other regional tsunami warning “users” or stakeholders, including China, Russia, Europe counterparts
- **Relationships and governance transitions** – IOC, ICG/IOTWS after restructure of exist Work Groups; global TWS Task Teams; **DBCP**.
- **New leadership appointments**