

PTWC Historical Keynote 2005 – 2015

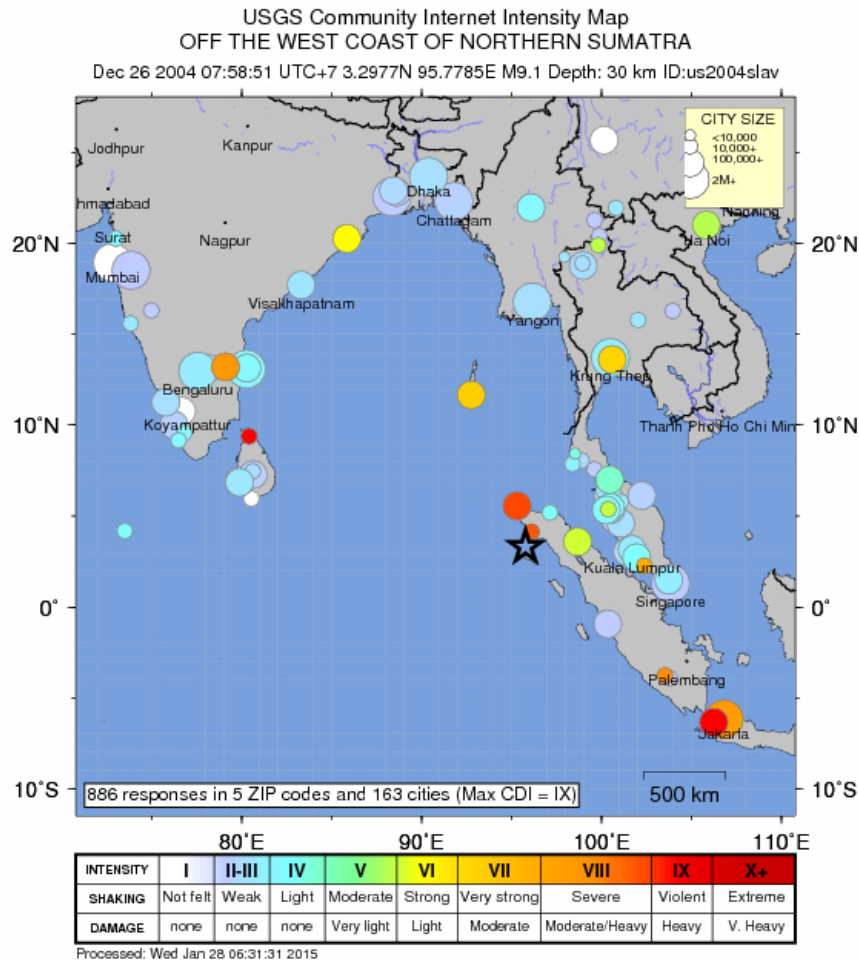
2004 Indian Ocean Tsunami

2011 Japan Tsunami

Masahiro YAMAMOTO

- 1972: Seismological Division, JMA
- 1997 – 2002 CTBTO
- 2004 – 2005 JMA, TWC
- 2005 – 2012 IOC/UNESCO

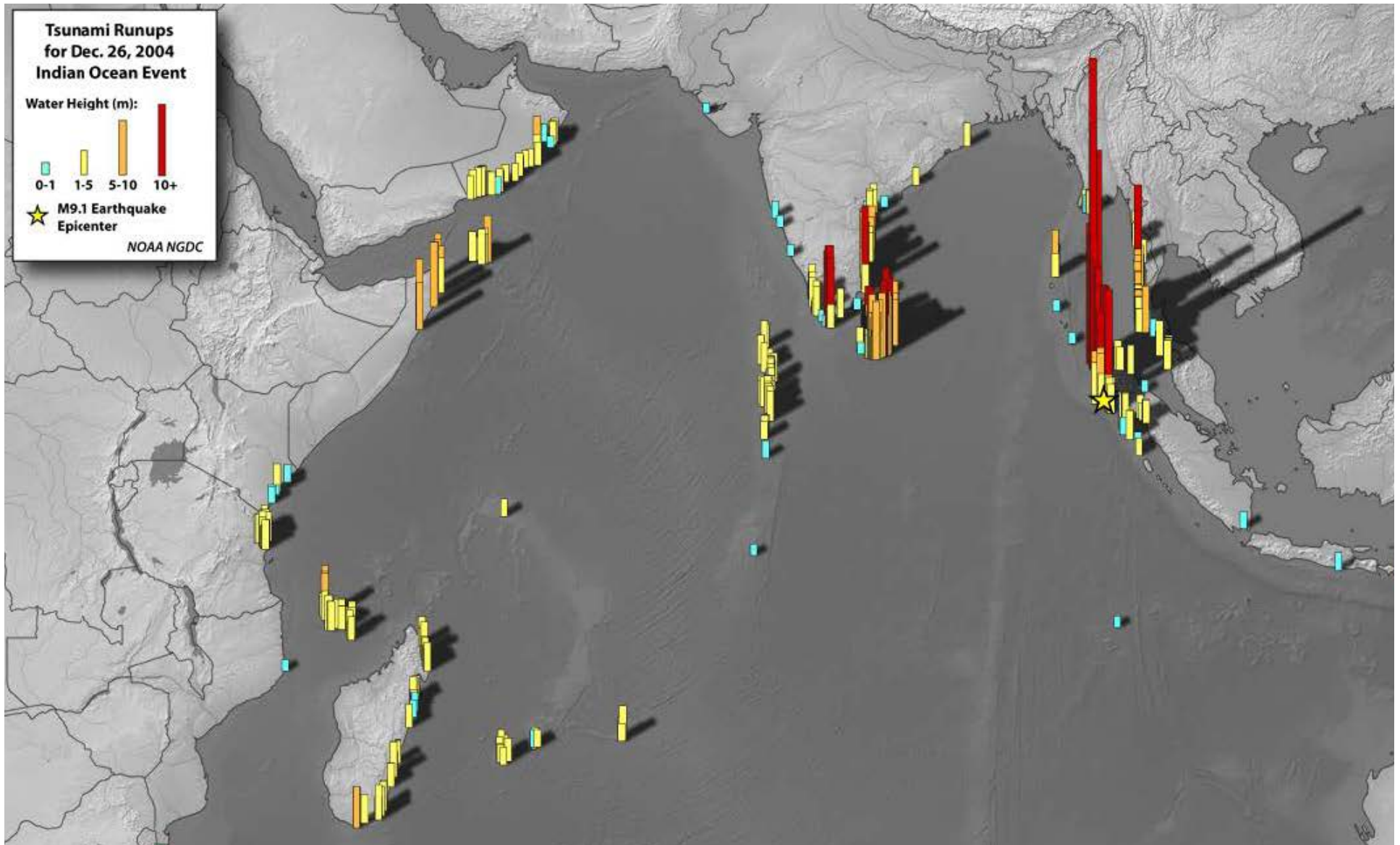
Off the west coast of SUMATRA



- 230,000 dead
- Magnitude: 9.1
- Sunday 07:58AM Local time
- 250km SSE of Banda Aceh, Sumatra
- 1590km NW of Jakarta

2004 Indian Ocean Tsunami

(NOAA Geophysical Data Center)

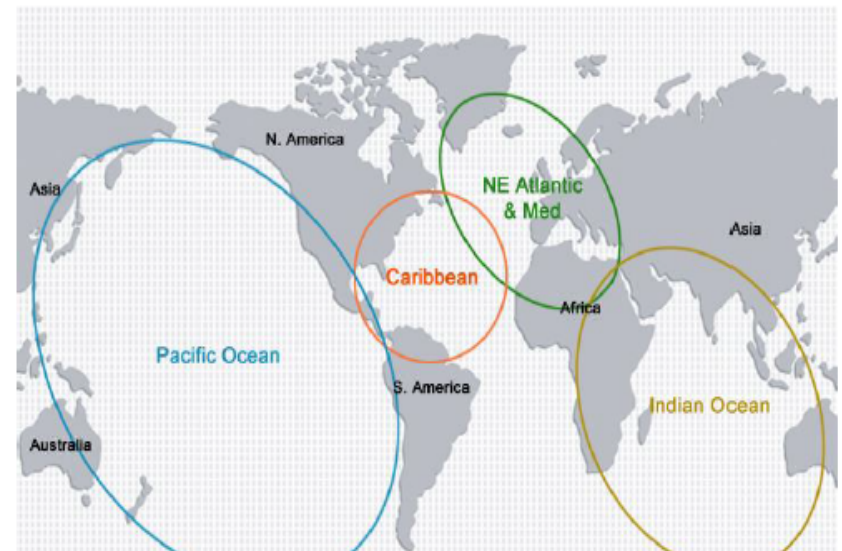


Tsunami Warning System

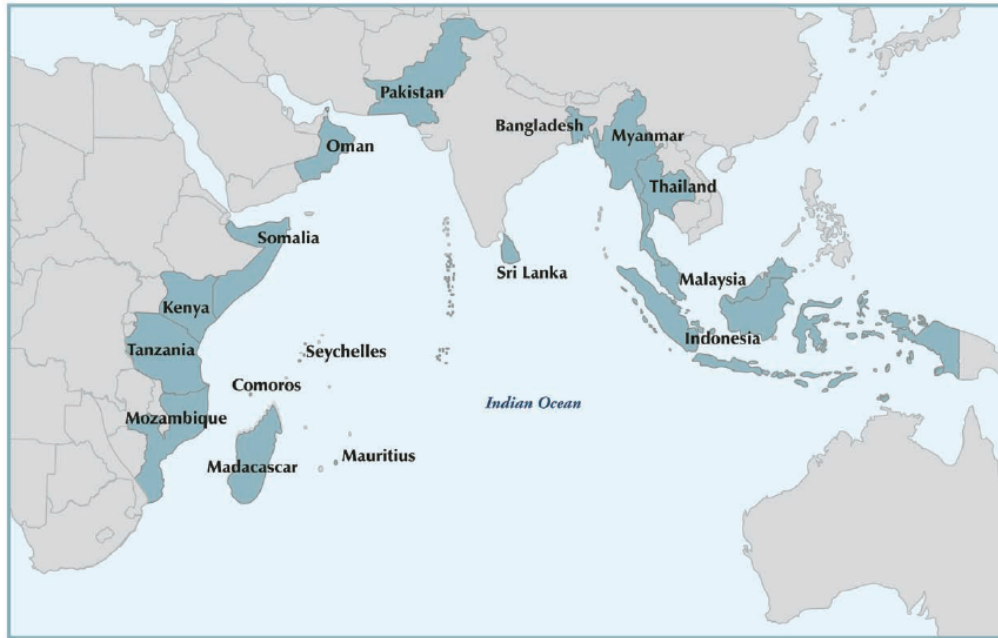
- **26 Dec 2004: Indian Ocean Tsunami**
- Jan 2005: WCDR, Kobe, Japan
- Mar: 1st Coordination Meeting, Paris
- **Mar: CTBTO & UNESCO (Data Share)**
- Apr: 2nd Coordination Meeting, Mauritius
- **Jun: UNESCO Assembly**

(ICG)

Indian Ocean,
NE Atlantic/Mediterranean
Caribbean



International Assessment Team



- May ~ Sep 2005
- IOC, ISDR, WMO, ADRC & international experts

16 counties; Indonesia, Malaysia, Thailand, Bangladesh, Sri Lanka, Pakistan, Oman, Somalia, Kenya, Tanzania, Mozambique, Seychelles, Madagascar, Mauritius

(3 countries in later) Iran, Yemen, Timor Este

Missions in 2005

2005	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1			Vienna					Perth		Chile		
2			Paris					Perth		Chile		
3			Vienna					Perth		Chile		
4			Paris					Perth		Chile		
5			Vienna					Perth		Chile		
6			Paris					Perth		Chile		
7			Vienna							Chile		
8			Paris							Chile	Jakarta	
9			Vienna			Myanmar				Chile	Jakarta	
10			Paris			Pakistan				Chile	Jakarta	India
11						Myanmar					Jakarta	India
12				Mauritius		Pakistan			Hawaii	Paris	Jakarta	India
13			Indonesia	Mauritius		Myanmar		Mauritius	Hawaii		Jakarta	India
14			Indonesia	Mauritius		Pakistan		Thailand	Hawaii			India
15			Indonesia	Mauritius		Myanmar		Bangladesh	Hawaii			India
16			Indonesia	Mauritius	Vienna	Pakistan		Mauritius	Hawaii			India
17			Indonesia	Mauritius	Vienna			Thailand				India
18	Kobe		Indonesia	Mauritius	Vienna			Bangladesh				India
19	Kobe			Mauritius	Vienna	Paris		Mauritius			Singapore	India
20	Kobe	Vienna		Mauritius		Paris		Thailand			Singapore	
21	Kobe	Paris		Mauritius		Paris		Bangladesh			Singapore	
22	Kobe	Vienna			Thailand	Paris		Mauritius			Singapore	
23		Paris			Thailand	Paris		Thailand			Singapore	
24	Beijing	Vienna			Thailand	Paris		Bangladesh			Singapore	
25	Beijing	Paris			Vietnam	Paris		Mauritius			Singapore	
26	Beijing	Vienna			Vietnam			Dysentery			Singapore	
27	Beijing	Paris			Vietnam			Hospital				
28		Vienna			Vietnam			Hospital				
29					Vietnam			Hospital				
30								Hospital				
31								Hospital				

Unexpected 2011 Japan Tsunami

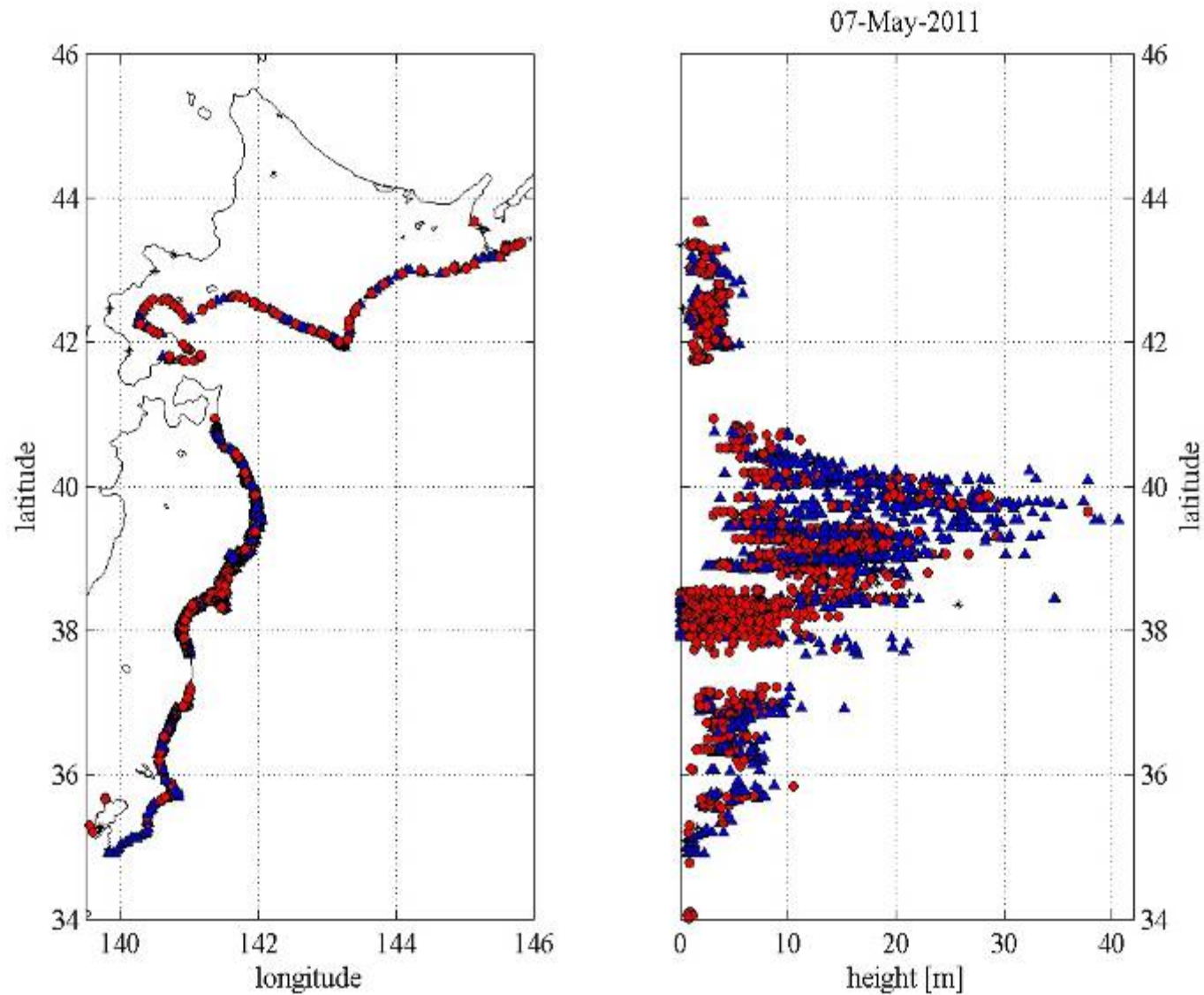


Minami-Sanriku
Disaster Management Center



Tsunami heights
red: inundation height, blue: run-up height

<http://www.coastal.jp/tjt/index.php>



Great Tsunami Wall



Japan - UNESCO - UNU INTERNATIONAL SYMPOSIUM

The Great East Japan Tsunami and Tsunami Warning Systems: Policy Perspectives

Summary Statement

ユネスコ・国連大学 国際シンポジウム

－人はなぜ逃げられなかったのか－

東日本大震災と津波警報システムのあり方を問う

－政策の観点から

ウ・タント国際会議場、国連大学（東京都渋谷区神宮前）

16 - 17 February 2012

U Thant International Conference Hall

United Nations University Tokyo

Symposium:

Lesson Learned & Policy Implications

- **S 1: What was unexpected? What is a new strategy to prepare for the unexpected?**
- **S 2: Education in schools and communities. Why do some people not evacuate?**
- **S3: What is an understandable and effective Tsunami Warning?**
- **S4: What is the role of mass media?**
- **S5: What is the role of international organization?**

Some Facts

- **M 9 EQ & Tsunami were unforeseen**
- **92.4% of deaths: drowning**
- **65% of deaths: over 60 years old**
- **More than 10 m run-up heights: 530 km coast**
- **Coastal tsunami protecting structures were destroyed: 190 km out of 300km**
- **Underestimated Warning & Tsunami walls delayed Immediate evacuation in some cases**

After 10 Years?

- **INCREASE (Revolution)**

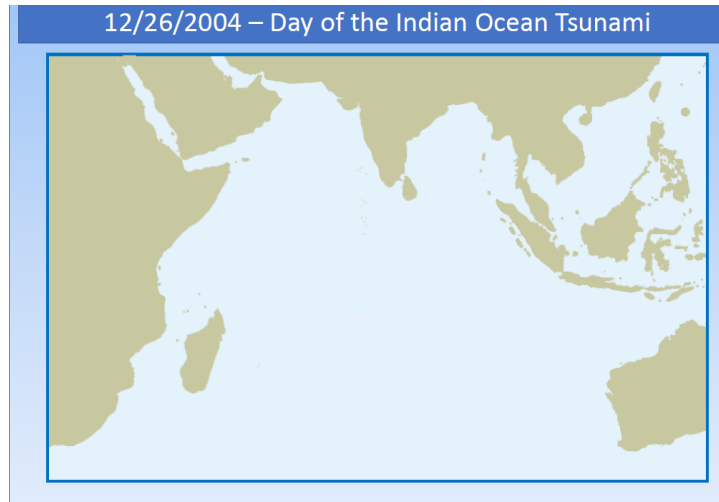
1. Many newly National TWCs are established
2. International Tsunami Warning Centers;
Indonesia, Australia, India, France, Greece,
Turkey, Italy
3. Number of seismic and sea-level stations
4. Regional collaboration: SE, SW & Central
Pacific and South China Sea

- **CHALLENGE**

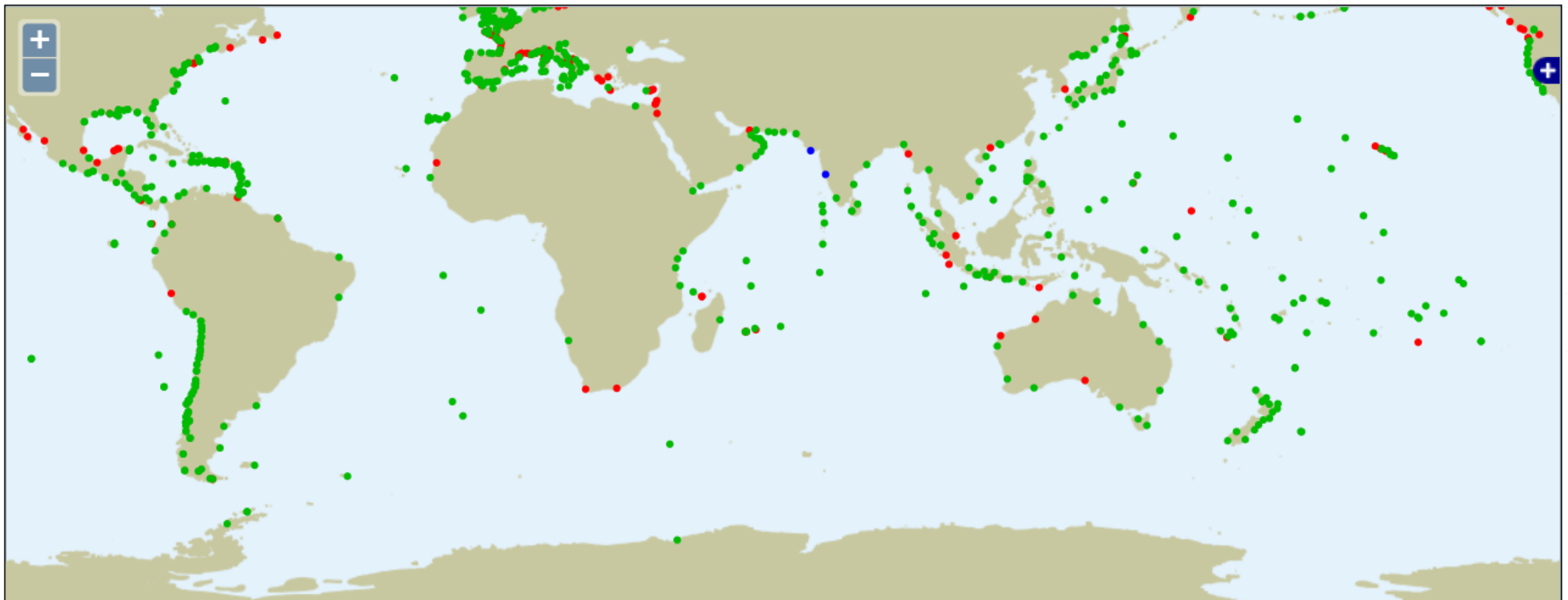
Sustainability!!! (Budget & Staff)

Real-time Reporting Sea Level Stations

**Present
> 100**



**Dec 2004
none**

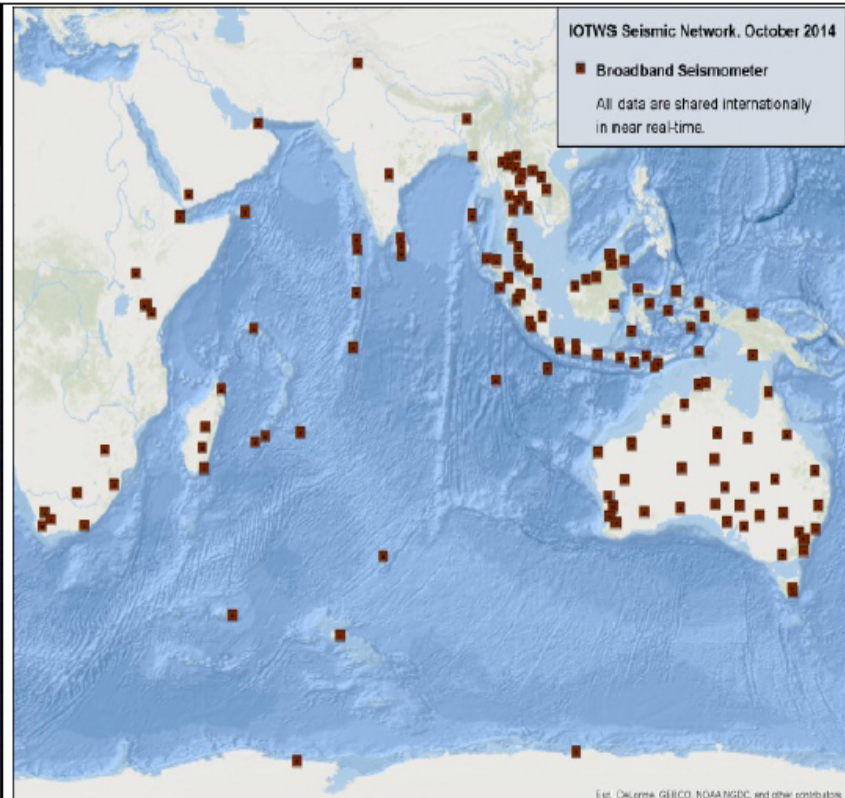
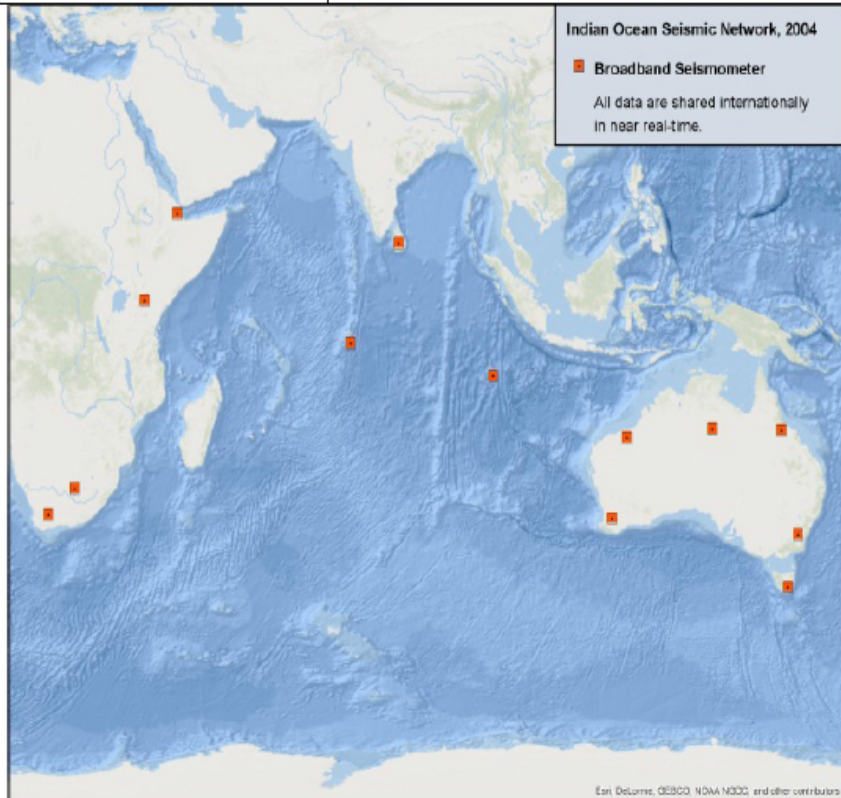


Seismic Network

IOTWS Core Seismic Network

Number of broadband seismometers sharing data in near real time:

- 2004: = 13 broadband seismometers
- 2014: >140 broadband seismometers





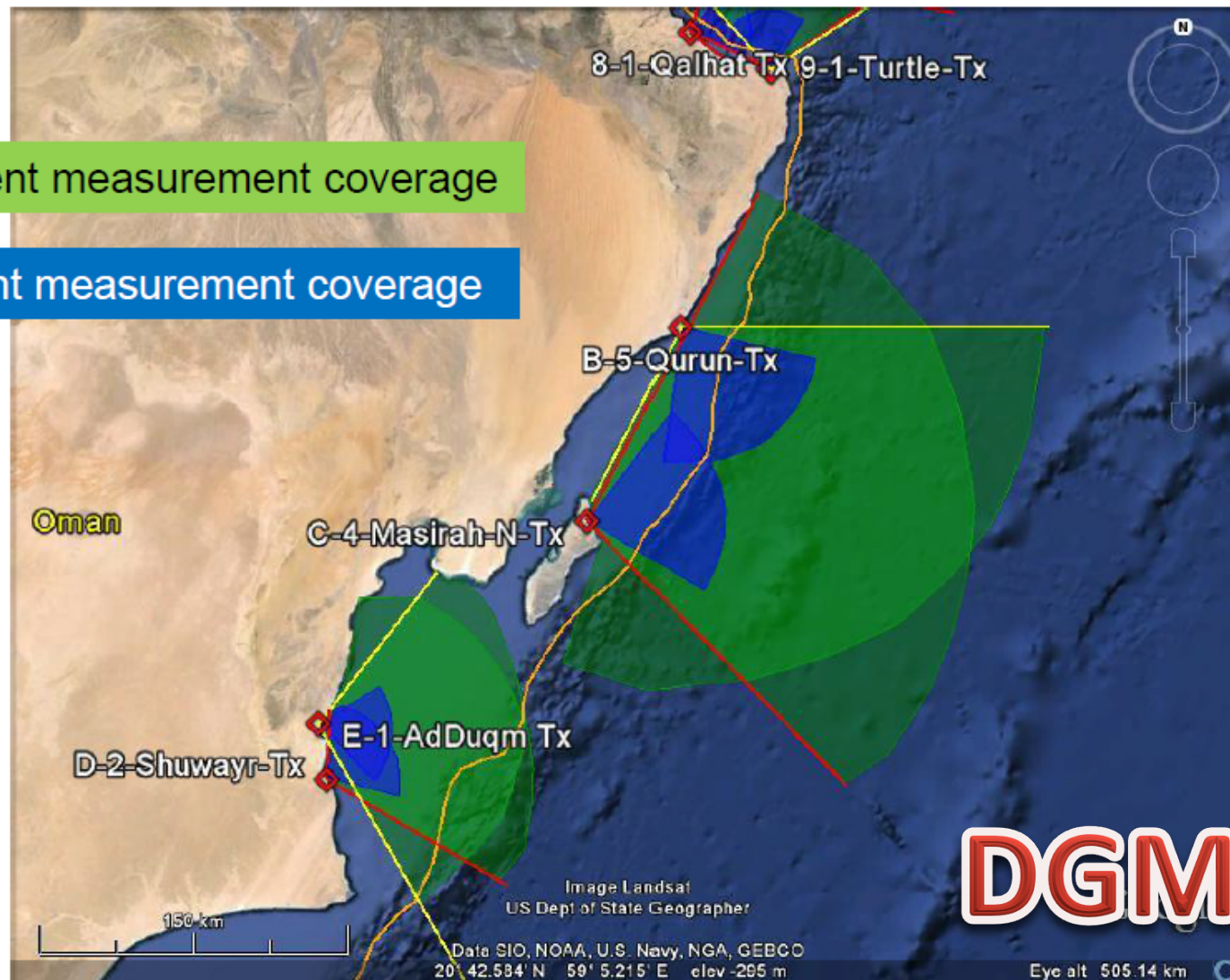
Oman New MH System (Start from March 2015)



WP-2. Wave Radar in the East coast; 4 WERA stations 9Mhz and 13Mhz at Duqm.

Wave current measurement coverage

Wave height measurement coverage



Tsunami Unit in 2008



A large, mature cherry blossom tree is in full bloom, its branches heavily laden with white flowers. In the foreground, a field of bright yellow rapeseed flowers is visible. Several people are standing on a gravel path, taking photos of the tree. One person is using a camera on a tripod. The sky is blue with some light clouds.

**Toward
A Timely/Accurate Warning
&
Safety Evacuation**

Thank you!