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After the 2004 Indian Ocean tsunami

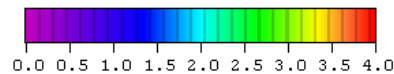
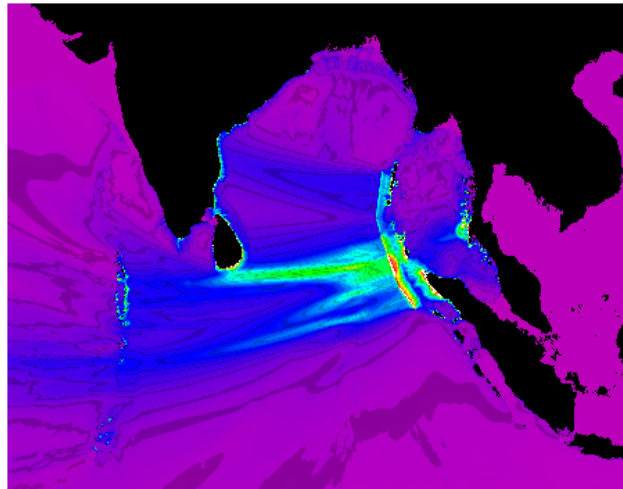
- ✓ Tsunami warning systems
- ✓ Tsunami evacuation and planning
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After the 2011 Tohoku tsunami

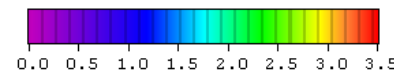
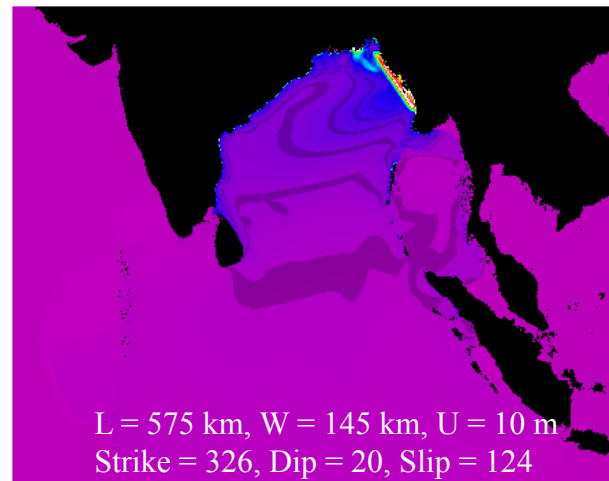
- ✓ 2012 Jakarta flood
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- ✓ Disaster reduction class

Computed maximum tsunami height: Indian Ocean

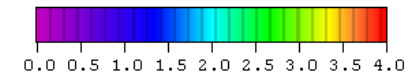
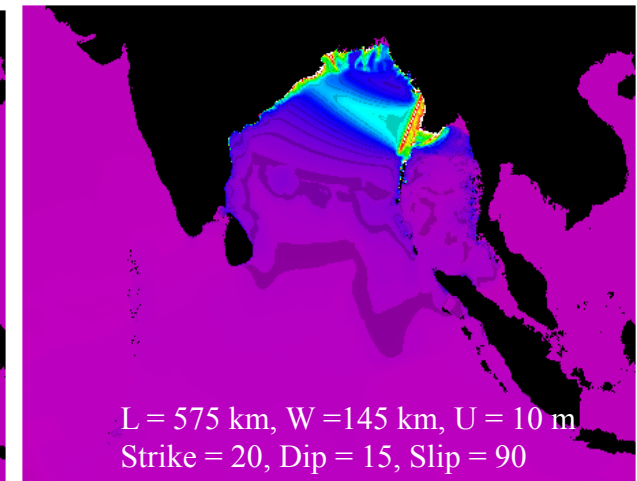
2004 Sumatra M_w 9.2



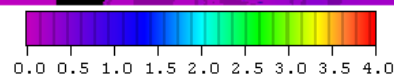
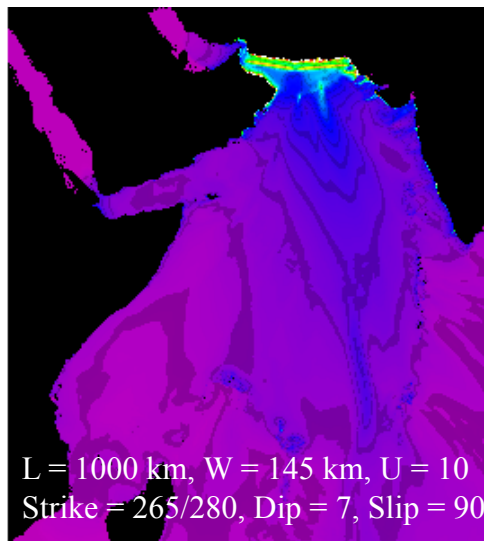
Arakan M_w 9.0



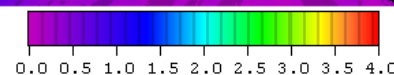
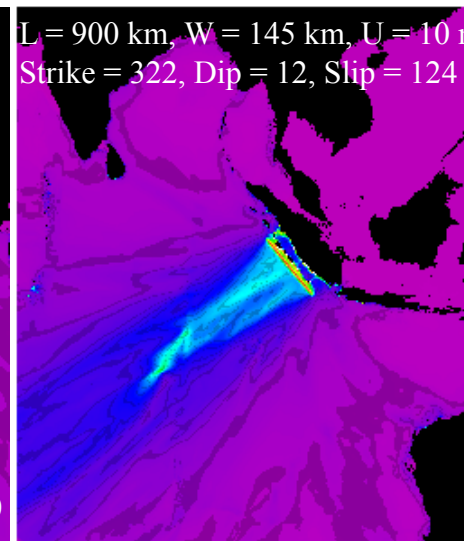
Andaman M_w 9.0



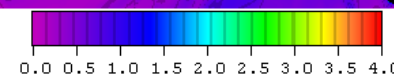
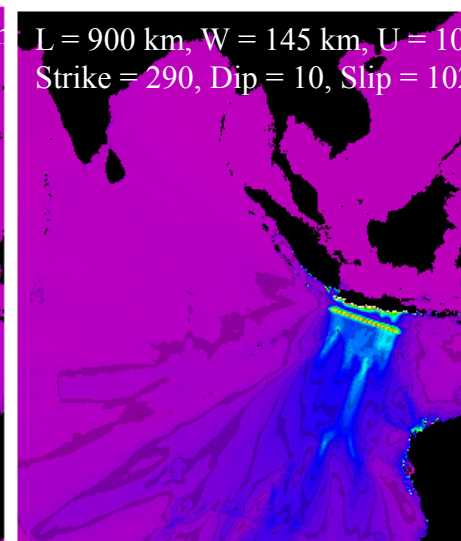
Makran M_w 9.0



Sumatra M_w 9.0



Java M_w 9.0



-- Calculation condition --

❖ Far-field tsunami simulation in spherical coordinates in linear term with neglecting effect from bottom friction.

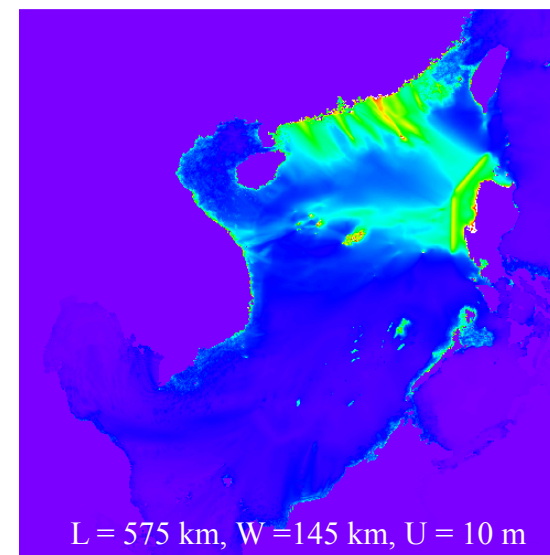
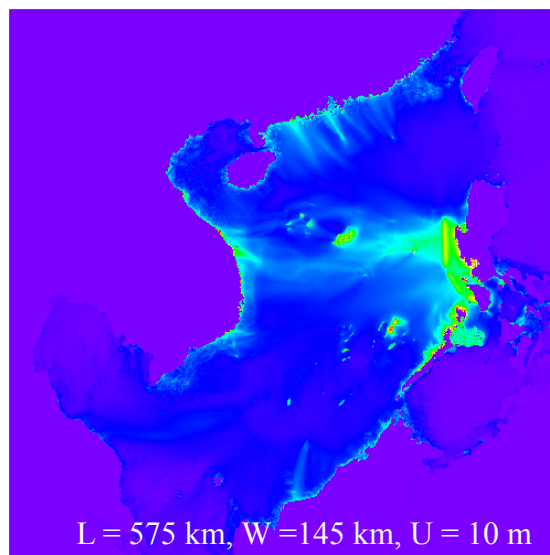
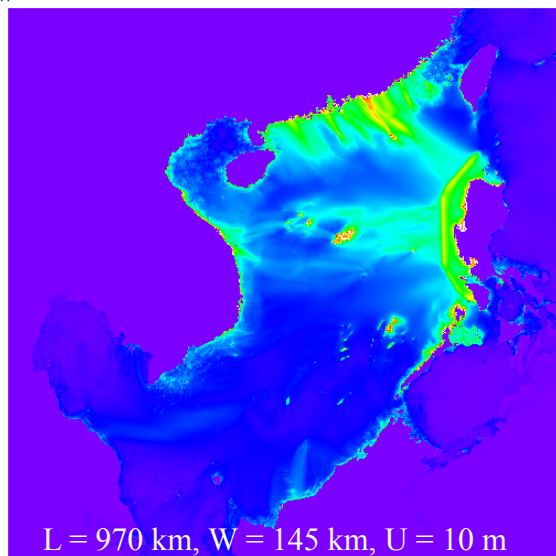
❖ $\Delta x = \Delta y = 1.855$ km and

❖ $\Delta t = 3$ sec

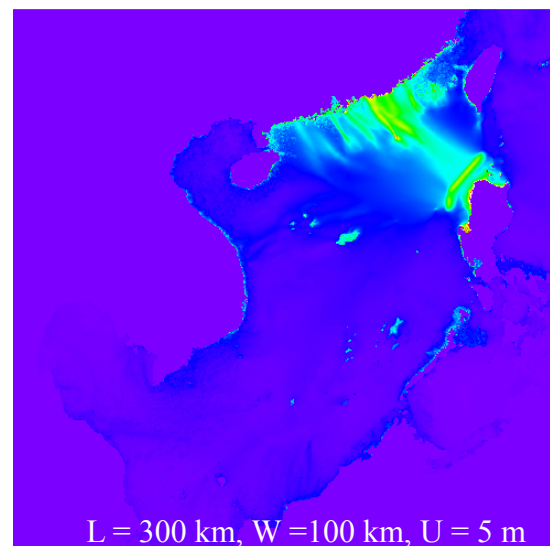
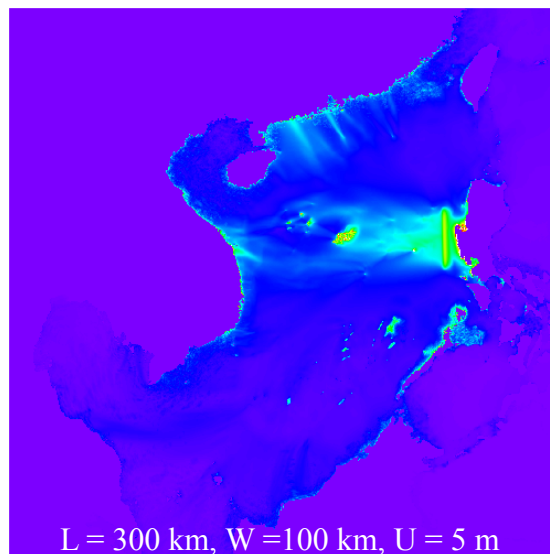
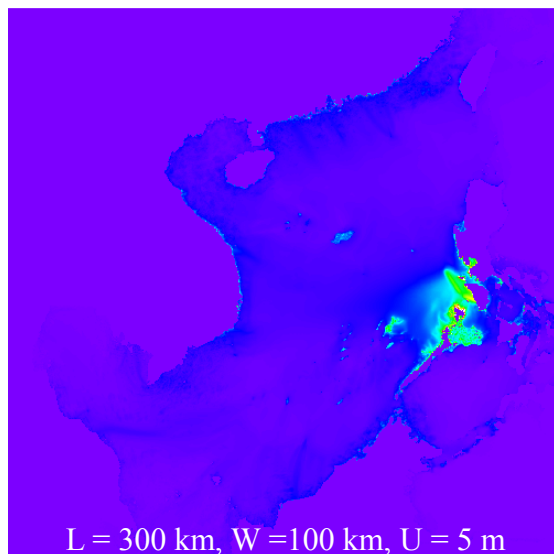
Suppasri, A., Imamura, F. and Koshimura, S. (2012) Tsunami hazard and casualty estimation in a coastal area that neighbors the Indian Ocean and South China Sea, Journal of Earthquake and Tsunami, 6(2), 1250010.

Computed maximum tsunami height: South China Sea

$M_w = 9.0$ class



$M_w = 8.5$ class



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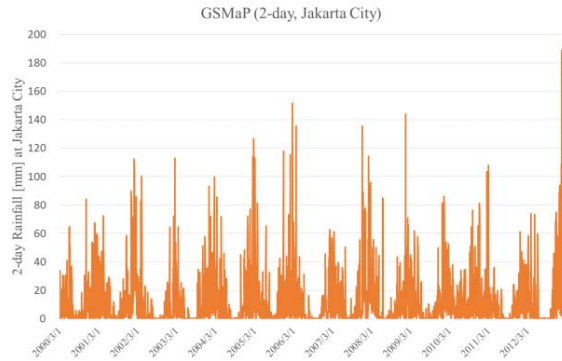
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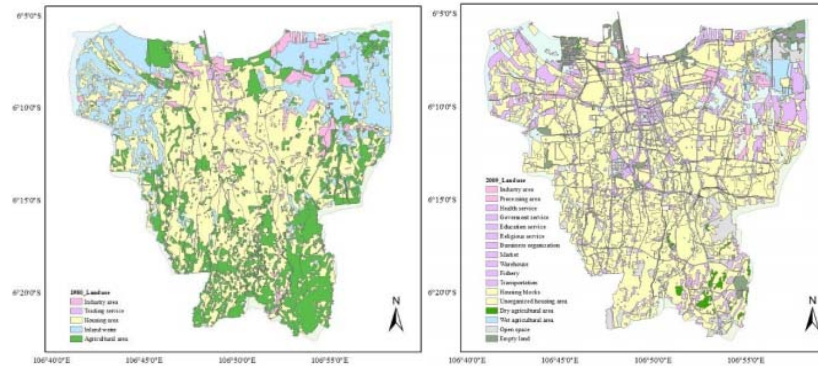
Factors Contributing to the 2013 Jakarta flood

1. Rainfall intensity



2-day rainfall depth in Jakarta (2000-2013)

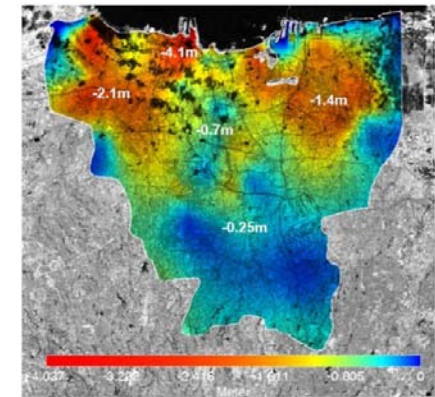
2. Rapid urbanization



1980

2009

3. Land subsidence



From 1974 through 2010

4. Embankment failure



5. Trash and sedimentation



6. Illegal development in the floodplain



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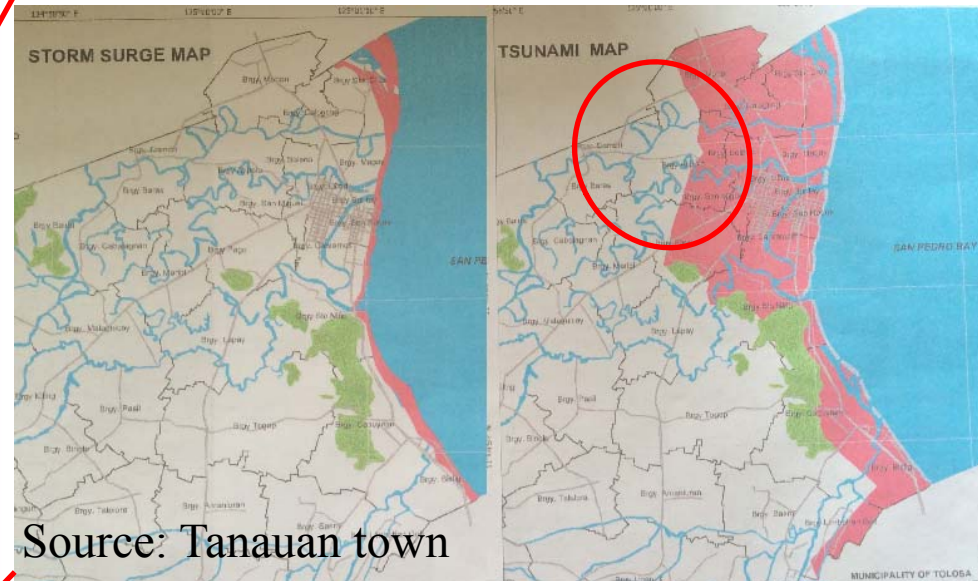
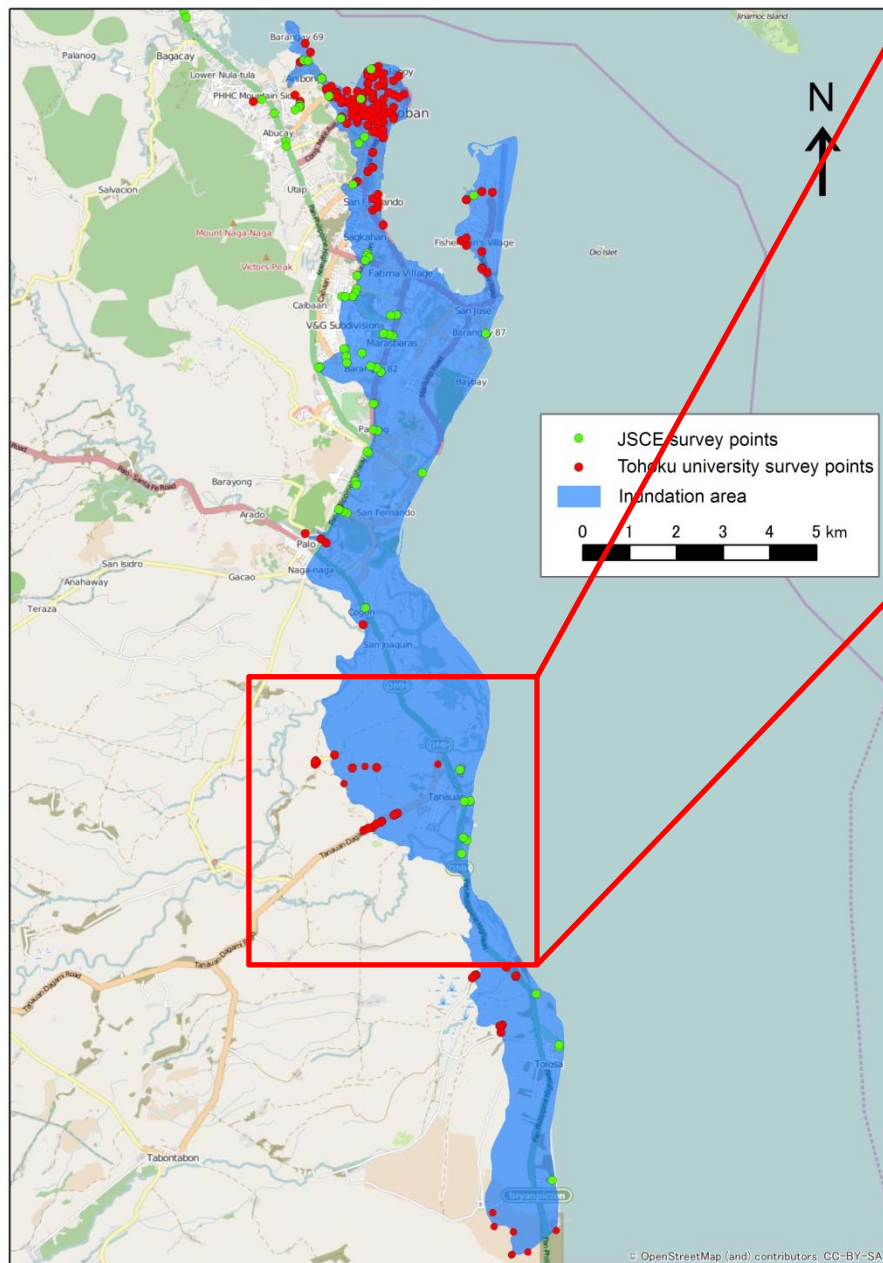
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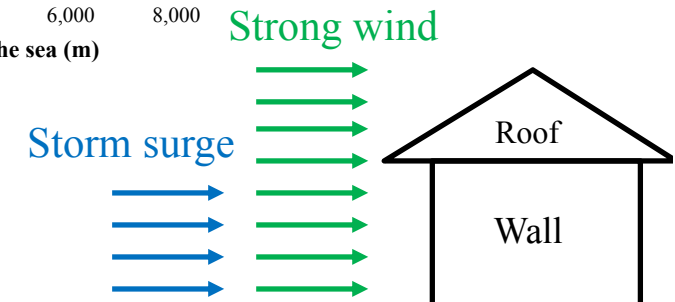
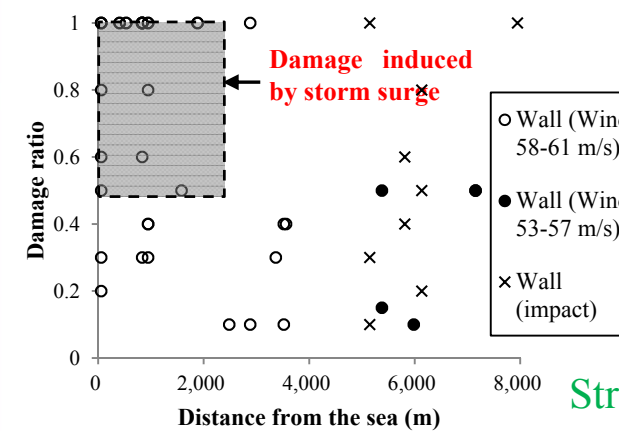
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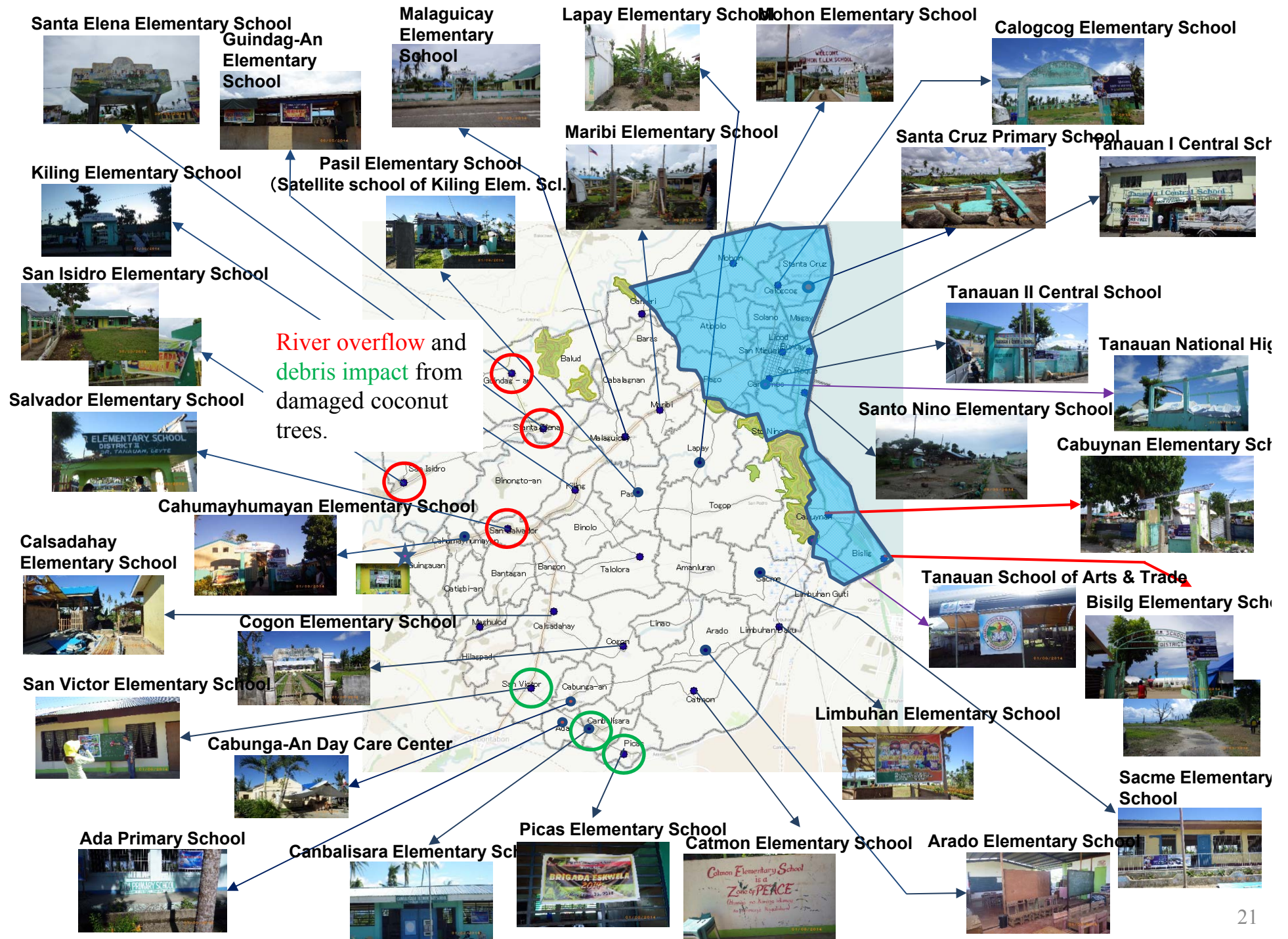
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Survey results: Inundation depth and inundation area



Source: Tanauan town





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World tsunami awareness day

**WORLD
TSUNAMI
AWARENESS
DAY**
5 NOVEMBER
2016



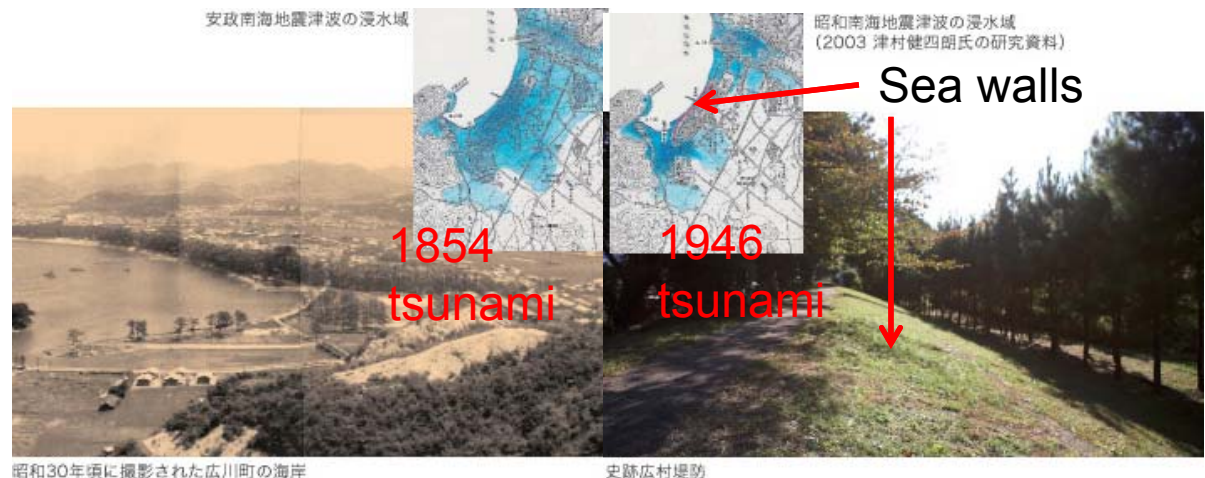
In December 2015, the UN General Assembly designated 5 November as World Tsunami Awareness Day.

World Tsunami Awareness Day was the brainchild of Japan, which due to its repeated, bitter experience has over the years built up major expertise in areas such as tsunami early warning, public action and building back better after a disaster to reduce future impacts.

The date for the annual celebration was chosen in honor of the Japanese story of “Inamura-no-hi”, meaning the “burning of the rice sheaves”. During an 1854 earthquake a farmer saw the tide receding, a sign of a looming tsunami. He set fire to his entire harvest to warn villagers, who fled to high ground. Afterwards, he built an embankment and planted trees as a buffer against future waves.



Goryo setting fire to his rice shaves

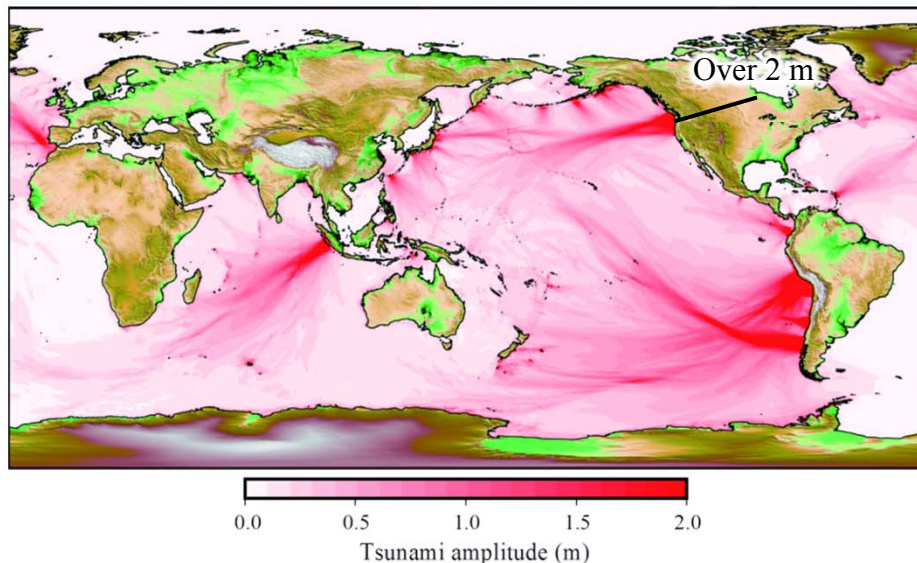


昭和30年頃に撮影された広川町の海岸

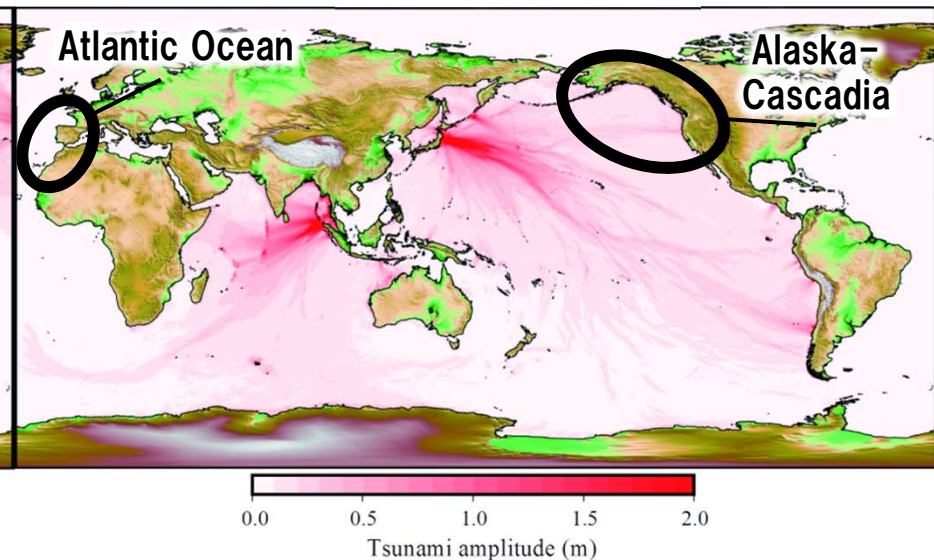
史跡広村堤防

Hazard from the past 400 years

1600-1969 (64 events)



1970-2016 (39 events)



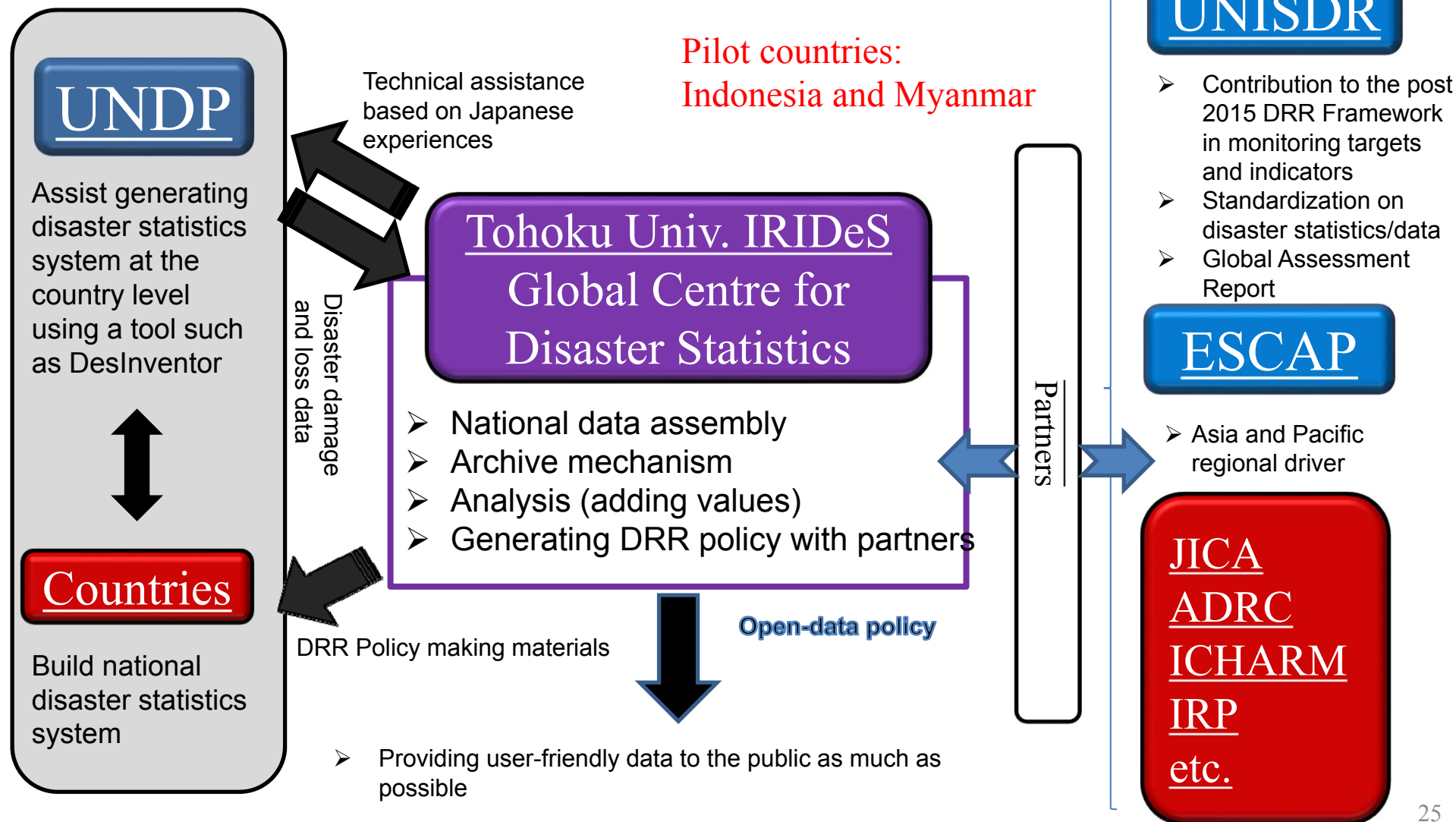
Damaging tsunamis that exceeded 2 m can be seen virtually everywhere, especially along the Pacific Rim including 1700 Cascadia (M9.0), 1755 Lisbon (M8.5), 1833 SW Sumatra (M8.3), 1868 Peru (M8.3), 1906 Ecuador (M8.8) and 1960 Chile (M9.5).

Only two major events, the 2004 Indian Ocean (M9.3) and Great East Japan (M9.0), classified as recent damaging tsunamis that exceeded 2 m and caused global impact meanwhile no major damaging tsunami in the east Pacific and Atlantic Ocean.

This observation demonstrates the importance of assessing or recognizing the hazards based on historical events beyond recent experiences.

Global Centre for Disaster Statistics

☆Aiming at practical research, global contribution



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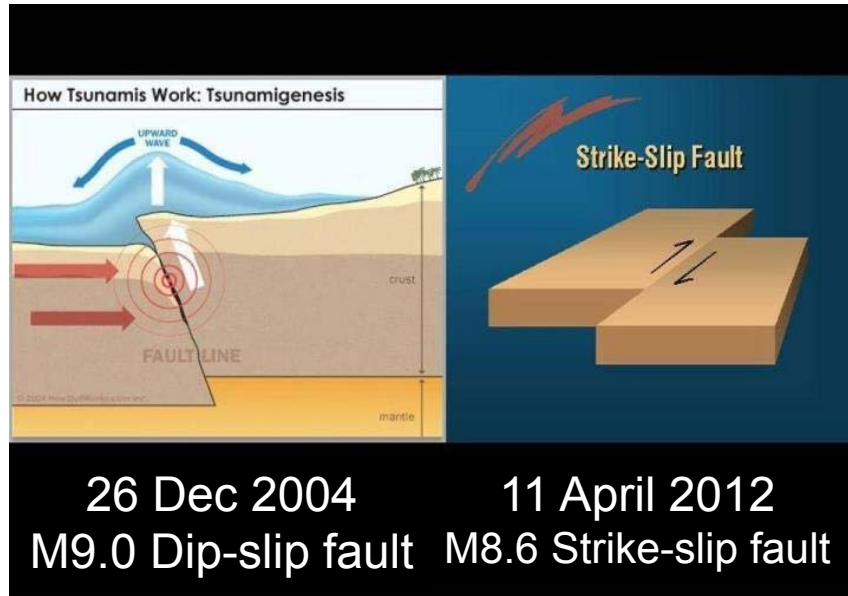
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Importance of education

EX: Tsunami warning on 11 April 2012



No tsunami **but**
very serious
traffic jam



Disaster reduction class in ASEAN countries



Banda Aceh, Indonesia (Two schools $\times$ two times = 200 students)



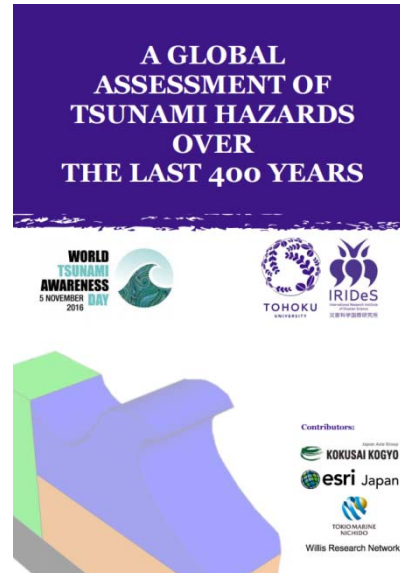
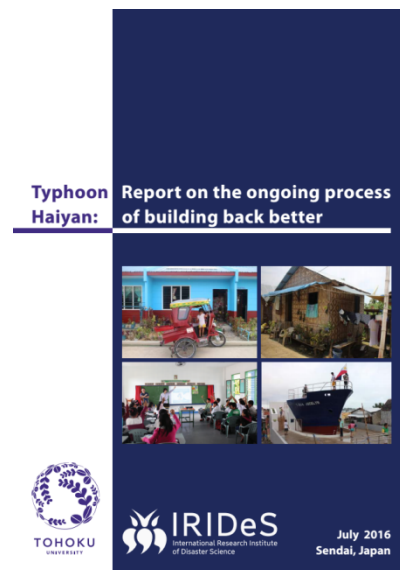
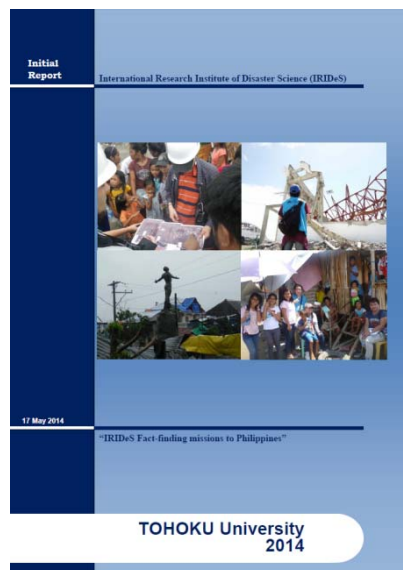
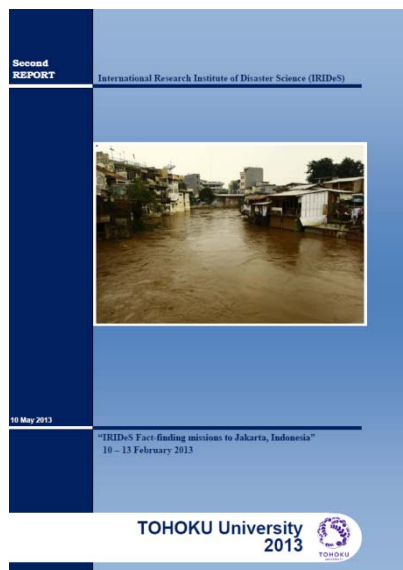
Phuket, Krabi and Bangkok
(Eight schools = 400 students)



Layte Island, the Philippines (Four schools = 200 students)



Our activities in more detail



Thank you

Sendai

Natori

Iwanuma

Watari

Yamamoto

