Japanese knowledge for bridging tsunami research networks between the UK and the middle east

Anawat Suppasri
Tsunami Engineering Laboratory
International Research Institute of Disaster Science (IRIDeS)
Tohoku University
Currently visiting UCL-IRDR

TOHOKU UNIVERSITY
IRIDeS International Research Institute of Disaster Science
UCL IRDR
Tohoku Univ. IRIDeS Tsunami Engineering Lab
TOKIO MARINE NICHIDO
Gallagher Re
科研費 KAKENHI
Pacific Consultants Producing The Future™
FUKKEN

The TIME (Tsunami Inundation Modeling Exchange) project

This manual is based on "TSUNAMI NUMERICAL SIMULATION with the staggered leap-frog scheme (Numerical code of TUNAMI-N1)" of Dr. Fumihiko Imamura, Prof. of Tsunami Engineering School of Civil Engineering, Asian Inst. Tech. and Disaster Control Research Center, Tohoku University prepared in June, 1995 for TIME project. The TIME (Tsunami Inundation Modeling Exchange) started in 1991 as a joint effort of IUGG and IOC/UNESCO during IDNDR. The Disaster Control Research Center (DCRC), Tohoku University, Japan has been acting as the center of TIME, to transfer numerical technique of tsunami simulation to the countries which suffered or will suffer tsunami hazards. Fifteen institutions of twelve countries obtained the computer programs and manuals developed and prepared by DCRC through mails or by training directly from DCRC. Four institutions of four countries obtained the technique through Mr. Ortiz, one of the trainees of the TIME project. As of 2003, the TUNAMI code was transferred to nineteen institutions of fifteen countries.

TSUNAMI MODELLING MANUAL

(TUNAMI model)

by

Dr.Fumihiko Imamura
Prof. of Tsunami Engineering
School of Civil Engineering, Asian Inst. Tech .(1993-1995) and
Disaster Control Research Center, Tohoku University., Sendai, Japan

Dr. Ahmet Cevdet Yalciner
Assoc. Prof. in Middle East Technical University, Civil Enigneering Department, Ocean Engineering Research Center, Ankara Turkey

Res. Assist. Gulizar Ozyurt
Research Assistant in Middle East Technical University, Civil Enigneering Department, Ocean Engineering Research Center, Ankara Turkey

Prepared in JUNE 1995 by Imamura
Revised in JUNE 2005 by Imamura
Revised in AUGUST 2005 by Yalciner and Ozyurt
Revised in APRIL 2006 by Imamura, Yalciner and Ozyurt

Geophysical Research Letters

Estimate of the tsunami source of the 1992 Nicaraguan Earthquake from tsunami data

Fumihiko Imamura, Nobuo Shuto, Satoshi Ide, Yasuhiro Yoshida, Katsuyuki Abe

First published: 23 July 1993 | https://doi.org/10.1029/93GL01396 | Citations: 48

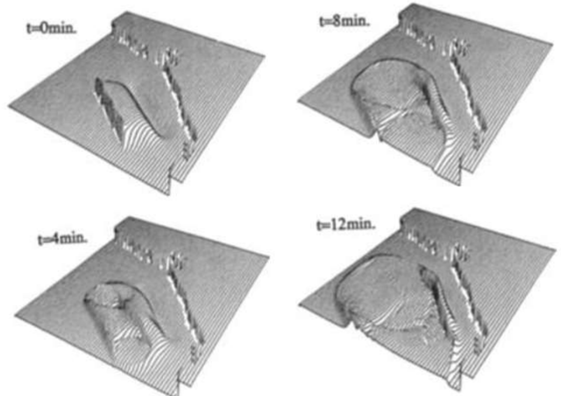


Fig.2 Wave pattern of tsunami propagation at 0, 4, 8 and 12 minutes after the origin time. The effect of rise time is instantaneous. The first tsunami waves on the Nicaraguan coast begin with an ebb.

Joint pioneer researches

ELSEVIER
Marine Geology 190 (2002) 445–463
INTERNATIONAL JOURNAL OF MARINE GEOLOGY, GEOCHEMISTRY AND GEOPHYSICS
www.elsevier.com/locate/margeo

Tsunamis in the Sea of Marmara
Historical documents for the past, models for the future

Ahmet Cevdet Yalçıner[a,*], Bedri Alpar[b,*], Yıldız Altınok[c], İlknur Özbay[a], Fumihiko Imamura[d]

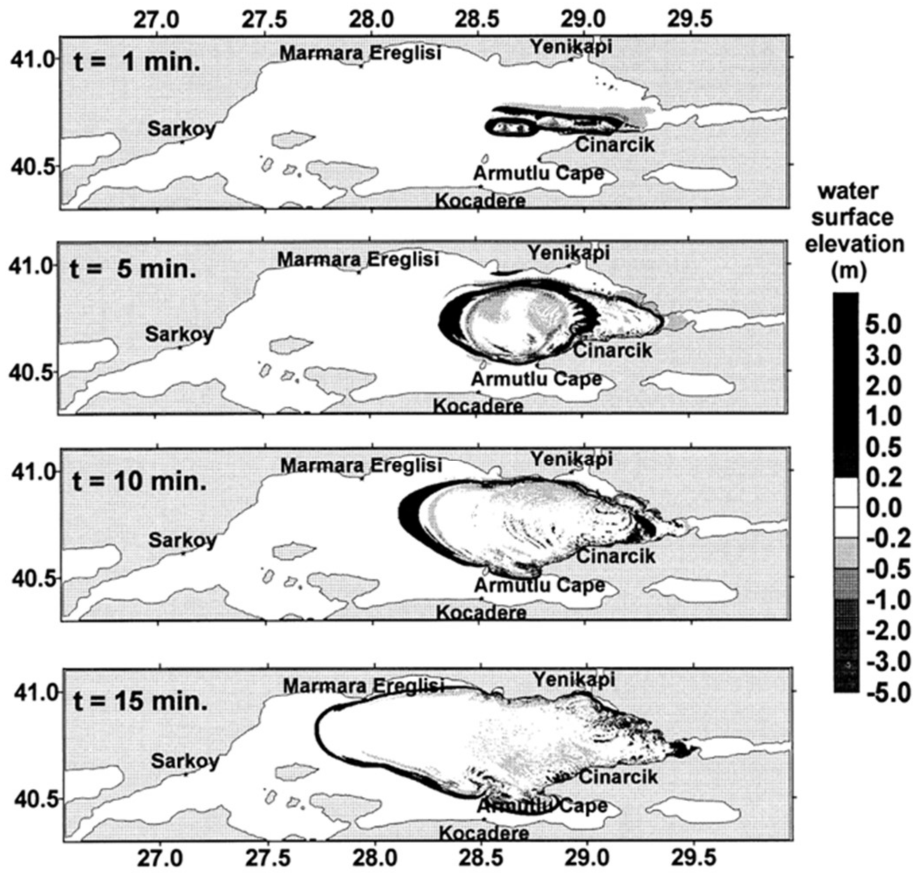


Fig. 10. Sea state at 1, 5, 10, and 15 min of tsunami propagation according to fault break and the underwater landslide scenario offshore Armutlu Peninsula (Case 3).

RESEARCH ARTICLE | JANUARY 01, 2000

Discovery of Minoan tsunami deposits

K. Minoura; F. Imamura; U. Kuran; T. Nakamura; G. A. Papadopoulos; T. Takahashi; A. C. Yalciner

+ Author and Article Information

Geology (2000) 28 (1): 59–62.

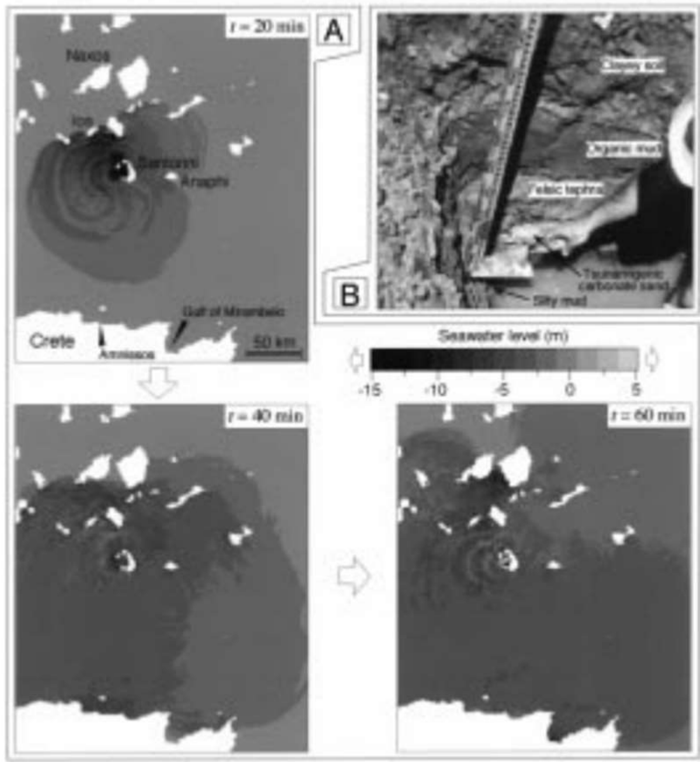


Figure 2. A: Results of numerical simulation. First wave reached Aegean Sea coast of western Turkey 2.5 hr after volcanic collapse. It is suggested that on northern coast of Crete, maximum runup height was 6–11 m and runup inundation distance was 500 m at most. B: Tsunami deposits and overlying felsic tephra layer exposed on trench wall, Didim, western Turkey.

Field survey of the 2011 tsunami with Prof. Yalciner

Erick Mas: IRIDeS, Tohoku University

Ocal Necmioglu:
European Commission

Nikos Kalligeris:
Institute of Geodynamics, National Observatory of Athens

Outputs from the field survey

Home > Pure and Applied Geophysics > Article

Lessons Learned from the 2011 Great East Japan Tsunami: Performance of Tsunami Countermeasures, Coastal Buildings, and Tsunami Evacuation in Japan

Open Access | Published: 07 July 2012 | **170**, 993–1018 (2013)

Anawat Suppasri, Nobuo Shuto, Fumihiko Imamura, Shunichi Koshimura, Erick Mas & Ahmet Cevdet Yalciner

Damage from the tsunami inundation of Kamaishi city with a maximum runup height of 11.7 m (1/6/2011) and of Ofunato city with a maximum runup height of 10.9 m (1/6/2011)

Seawalls damaged by scouring in Ishinomaki city (*left*, 26/4/2011) and by sliding in Yamada town (*right*, 31/5/2011)

Performance of Kamaishi Breakwaters

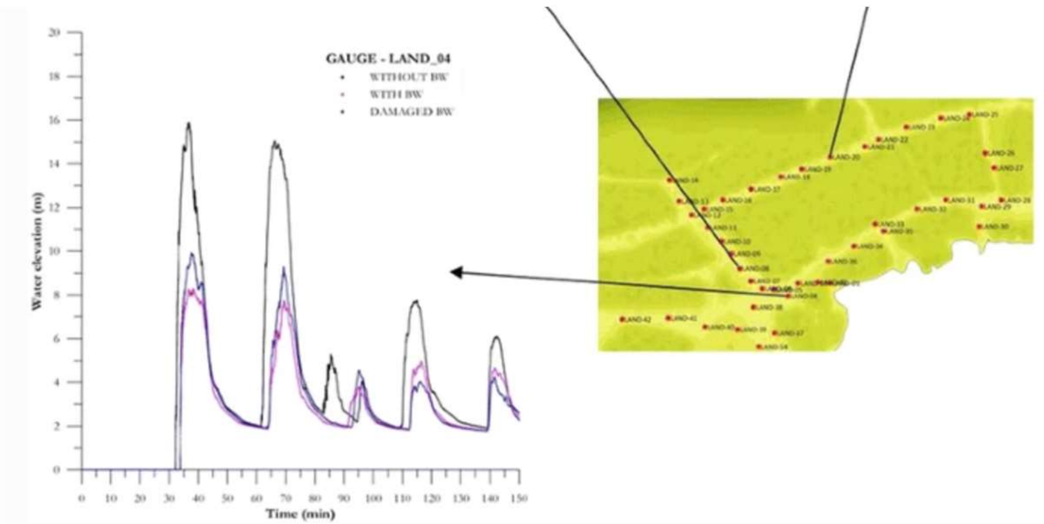
Home > Pure and Applied Geophysics > Article

Published: 14 March 2015

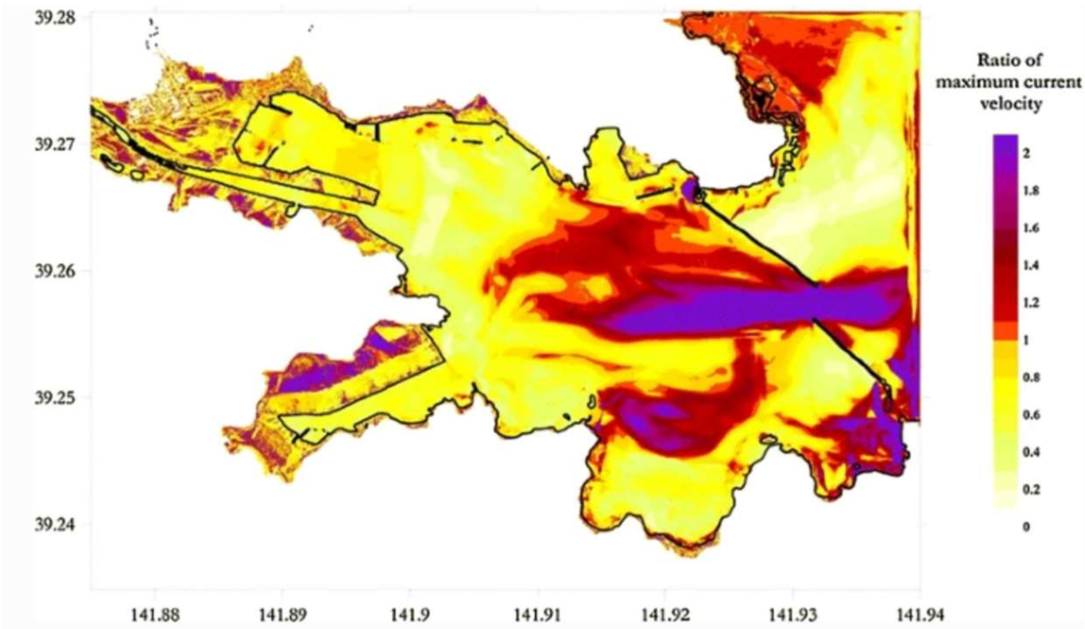
Investigation of Hydrodynamic Parameters and the Effects of Breakwaters During the 2011 Great East Japan Tsunami in Kamaishi Bay

Ceren Ozer Sozdinler, Ahmet Cevdet Yalciner, Andrey Zaytsev, Anawat Suppasri & Fumihiko Imamura

Pure and Applied Geophysics **172**, 3473–3491 (2015) | Cite this article



Water level fluctuations during the simulations at the three selected gauges for with-, without- and damaged breakwater cases



The ratio of maximum current velocity between with- and without breakwater cases

Tsunami hazards in Marmara Sea

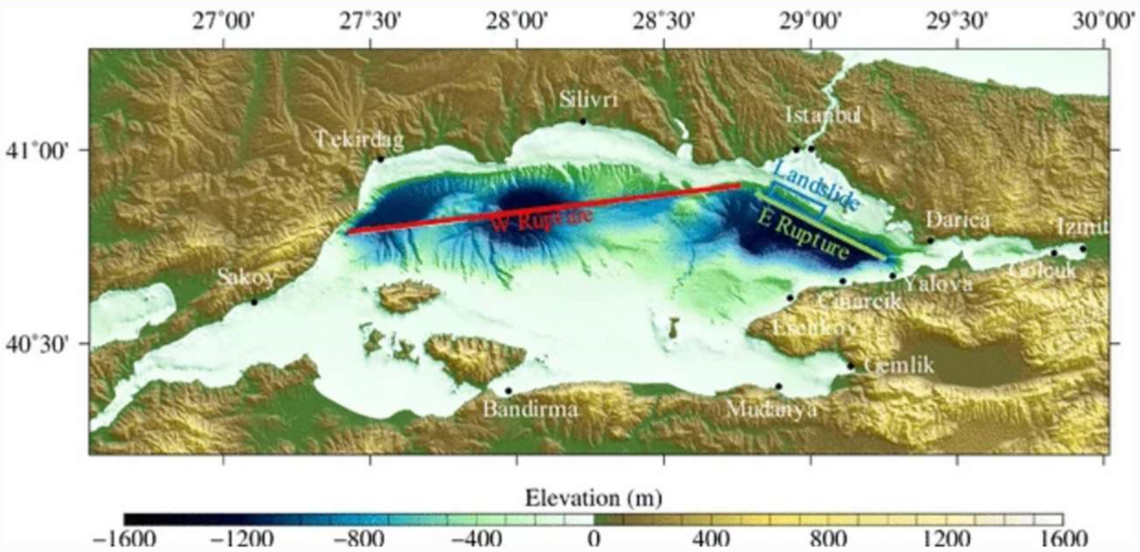
Home > Pure and Applied Geophysics > Article

Published: 19 October 2016

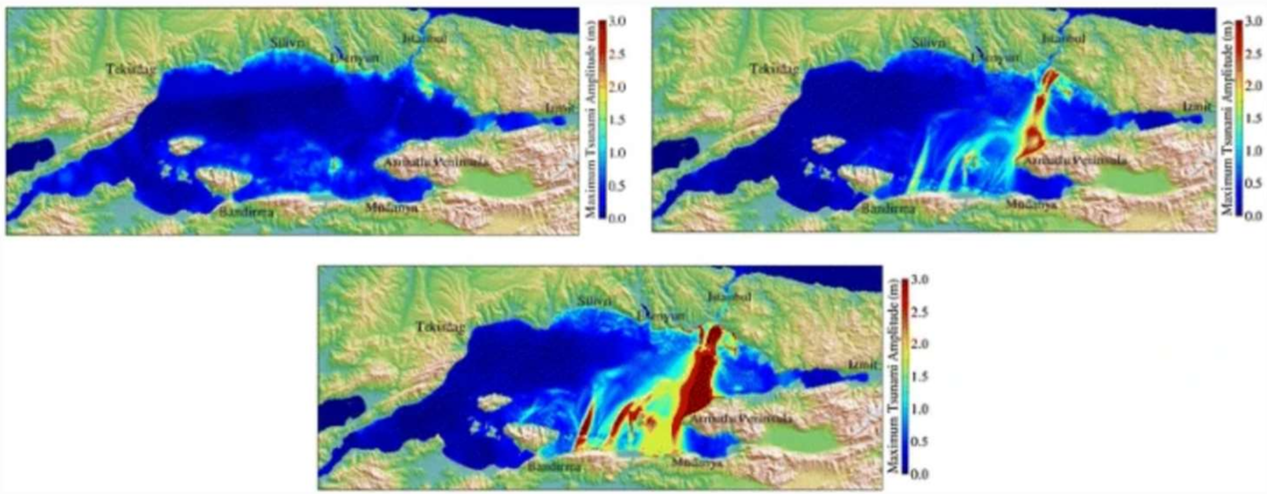
Possible worst-case tsunami scenarios around the Marmara Sea from combined earthquake and landslide sources

Panon Latcharote, Anawat Suppasri, Fumihiko Imamura, Betul Aytore & Ahmet Cevdet Yalciner

Pure and Applied Geophysics **173**, 3823–3846 (2016) | Cite this article



Location of earthquake and landslide sources in Marmara Sea



Distribution of maximum tsunami amplitudes for EW rupture with small-, medium-, and large-volume landslides

Tsunami hazards from the Makran Subduction Zone

Nat Hazards (2018) 93:S127–S152
https://doi.org/10.1007/s11069-017-3097-7
CrossMark

ORIGINAL PAPER

Tsunami hazard evaluation for Kuwait and Arabian Gulf due to Makran Subduction Zone and Subaerial landslides

Panon Latcharote[1] · Khaled Al-Salem[3] · Anawat Suppasri[2] · Tanuspong Pokavanich[4] · Shinji Toda[2] · Yogeesha Jayaramu[3] · Abdullah Al-Enezi[3] · Alanoud Al-Ragum[3] · Fumihiko Imamura[2]

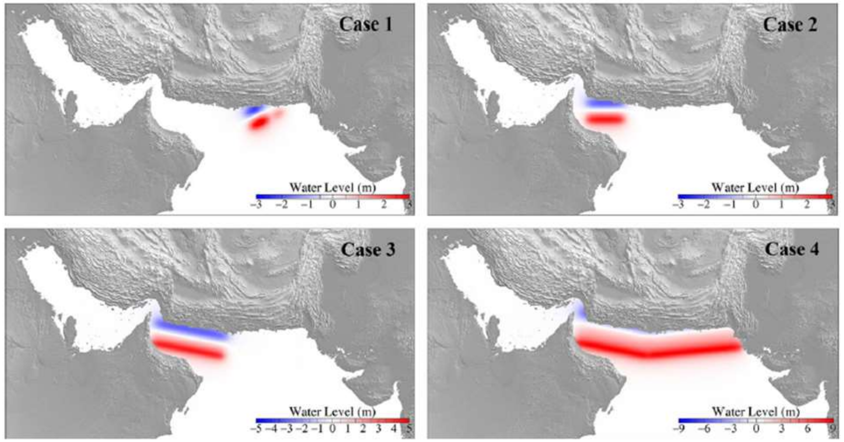


Fig. 9 Initial sea surface deformation for Cases 1 to 4

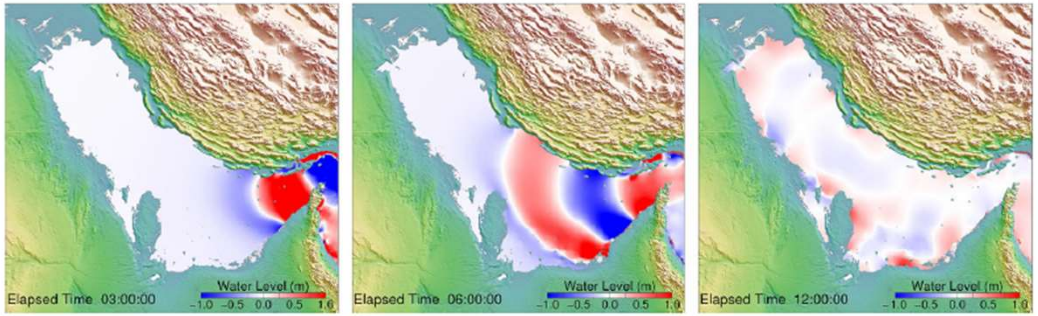


Fig. 11 Tsunami propagation after 3, 6, and 12 h for Case 4

ELSEVIER
Ocean Engineering 35 (2008) 774–786
www.elsevier.com/locate/oceaneng

Historical tsunami in the Makran Subduction Zone off the southern coasts of Iran and Pakistan and results of numerical modeling

Mohammad Heidarzadeh[a*], Moharram D. Pirooz[a], Nasser H. Zaker[b], Ahmet C. Yalciner[c], Mohammad Mokhtari[d], Asad Esmaeily[e]

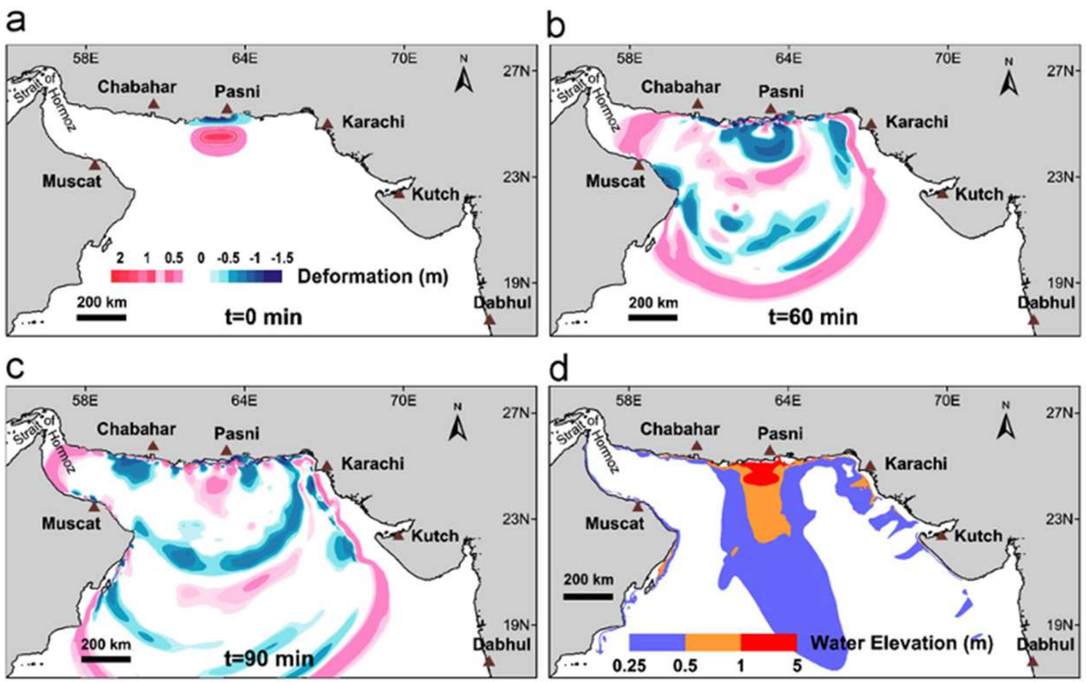


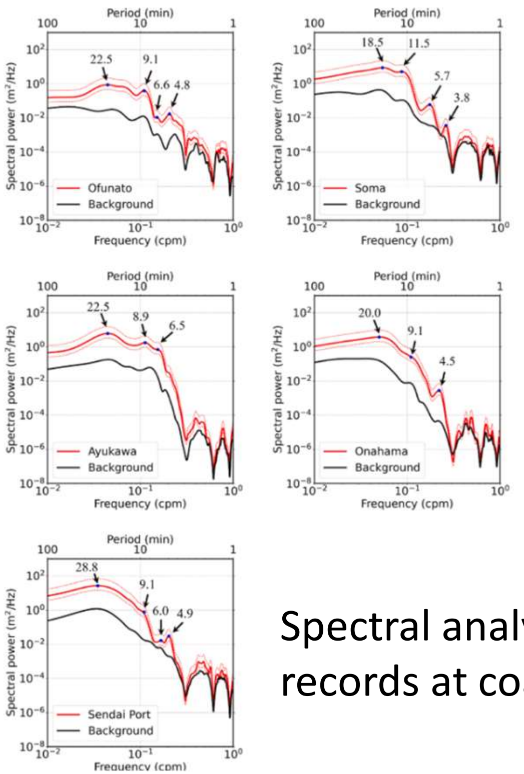
Fig. 5. Results of the tsunami generation (a) and propagation modeling (b, c, and d).

Tsunami hazards from in Tohoku

ELSEVIER
Ocean Engineering
Volume 287, Part 1, 1 November 2023, 115676

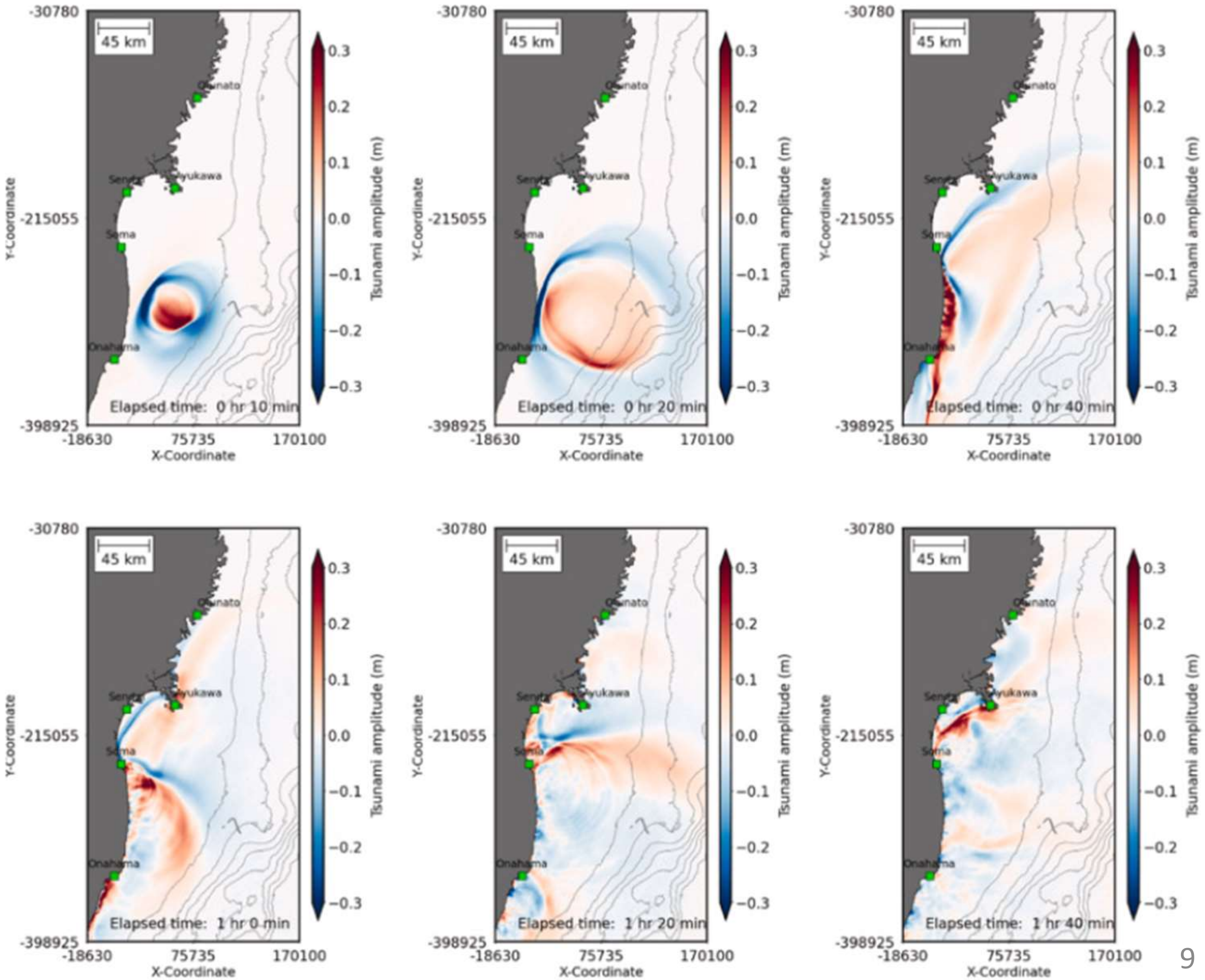
Tsunami wave characteristics in Sendai Bay, Japan, following the 2016 Mw 6.9 Fukushima earthquake

An-Chi Cheng [a], Anawat Suppasri [a b], Mohammad Heidarzadeh [c], Bruno Adriano [a b], Constance Ting Chua [b], Fumihiko Imamura [a b]



Spectral analysis for tsunami records at coastal tide gauges.

Snapshots of simulated tsunami propagation along north Pacific coast of Japan following the 2016 Fukushima earthquake.



Field survey of the 2011 tsunami with Prof. Raby

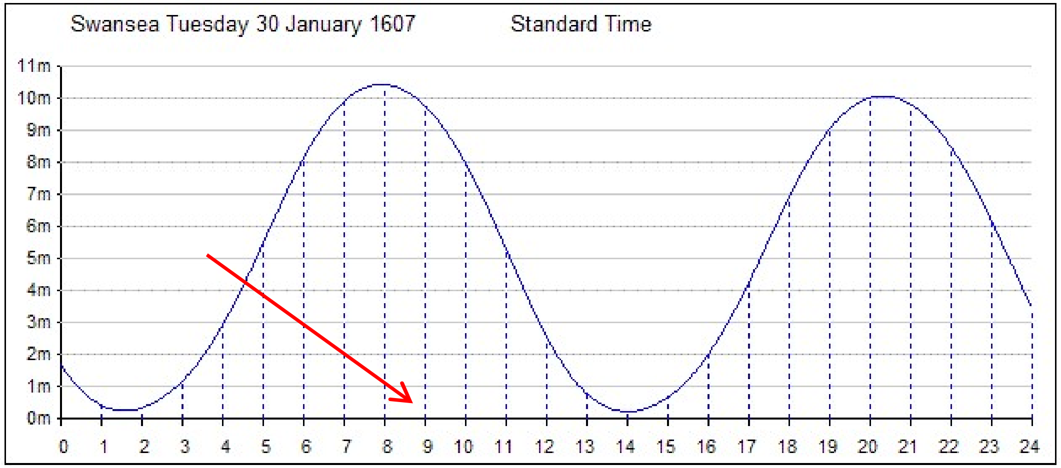
https://www.istructe.org/resources/report/eefit-mission-recovery-great-east-japan-earthquake/

The 1607 Bristol Channel flood

1607.

A true report of certaine wonderfull ouerflowings of Waters, now lately in Summerset-shire, Norfolke and other places of England: destroying many thousands of men, women, and children, overthrowing and bearing downe whole townes and villages, and drowning infinite numbers of sheepe and other Cattle

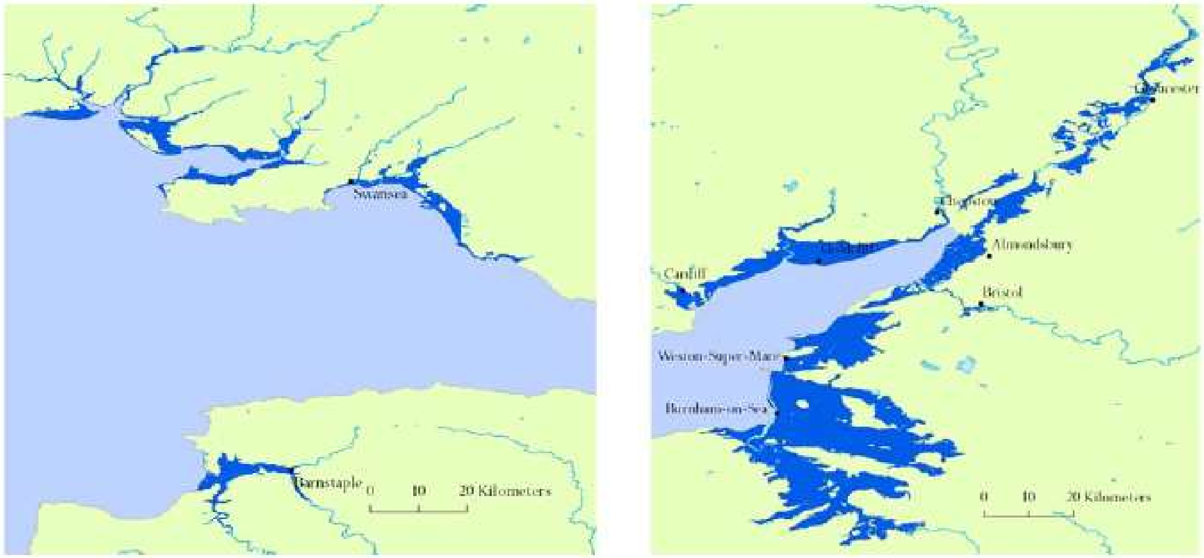
Printed at London by W.I. for Edward White and are to be solde at the signe of the Gunne at the North doore of Paules.



Exceptionally high spring tide on the morning of the flood

Caused by TSUNAMI, FLOOD or STORM SURGE ??

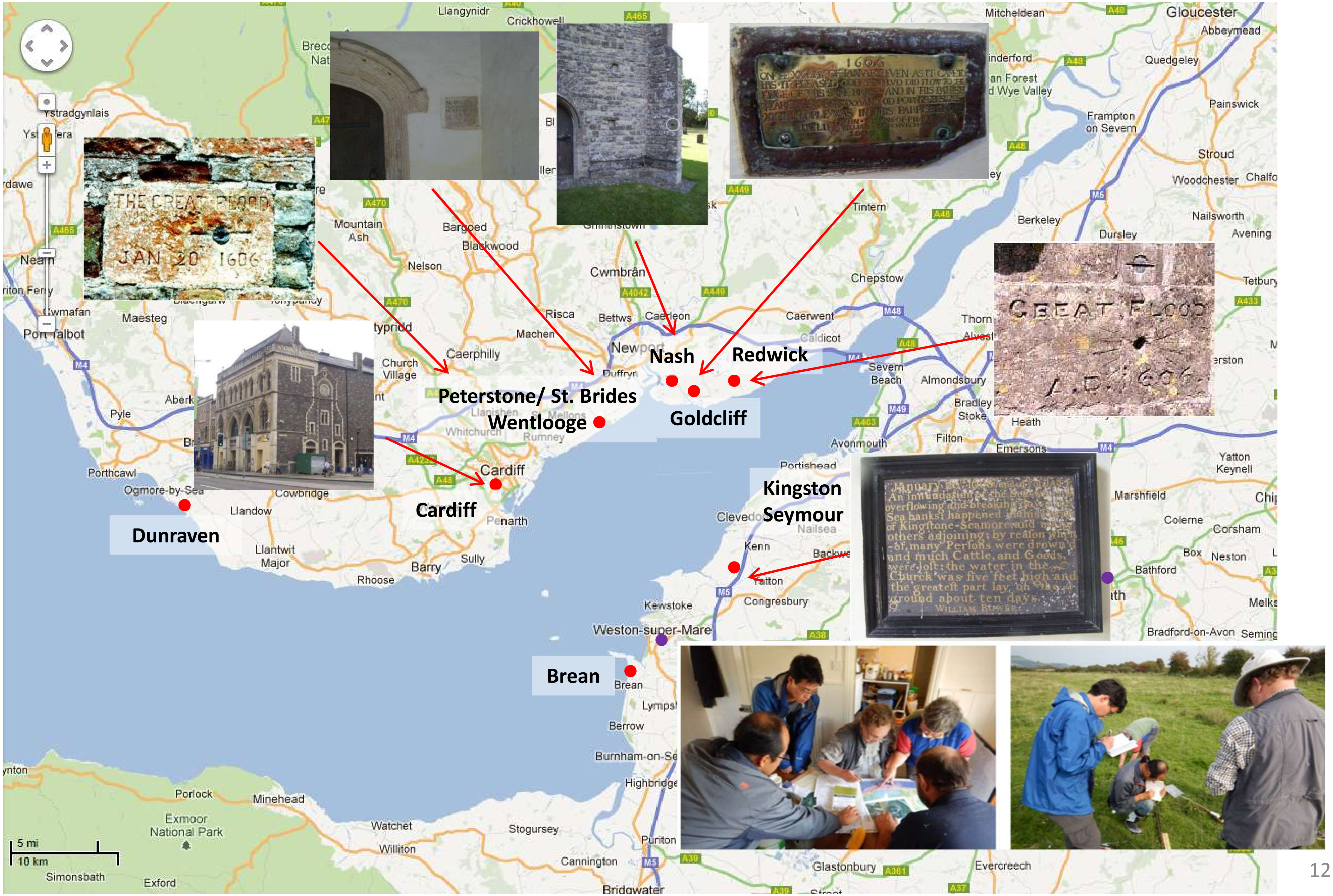
- No M> 7.5 recorded and very less impact by the 1755 Lisbon earthquake felt all Europe
- Records said that water was from the sea
- Some records mentioned about storm but no wind damage → wind speed < 100 km/h
- Only one record said clear sky → center of the storm?



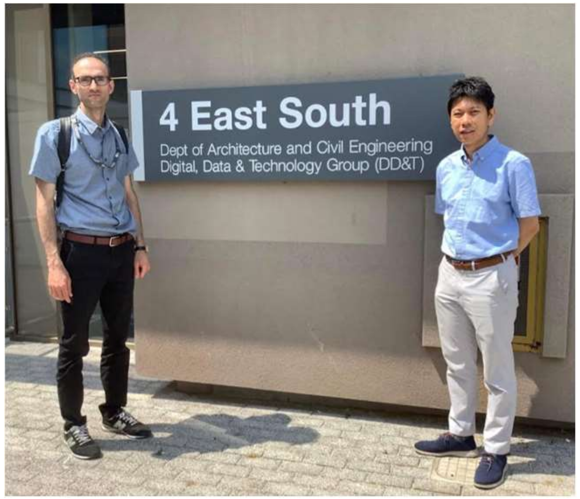
(a) (b)

Figure 8: Maps of Bristol Channel showing extent of flooding as modelled in 2007: (a) in the outer Bristol Channel (8 m water level) and (b) in the inner Bristol Channel (9.5 m water level)

A.D. 1606 Flood memorial in churches in Bristol Channel



Look forward to future collaboration!



June 2023@Bath

September 2023@Ankara

June 2023@Plymouth