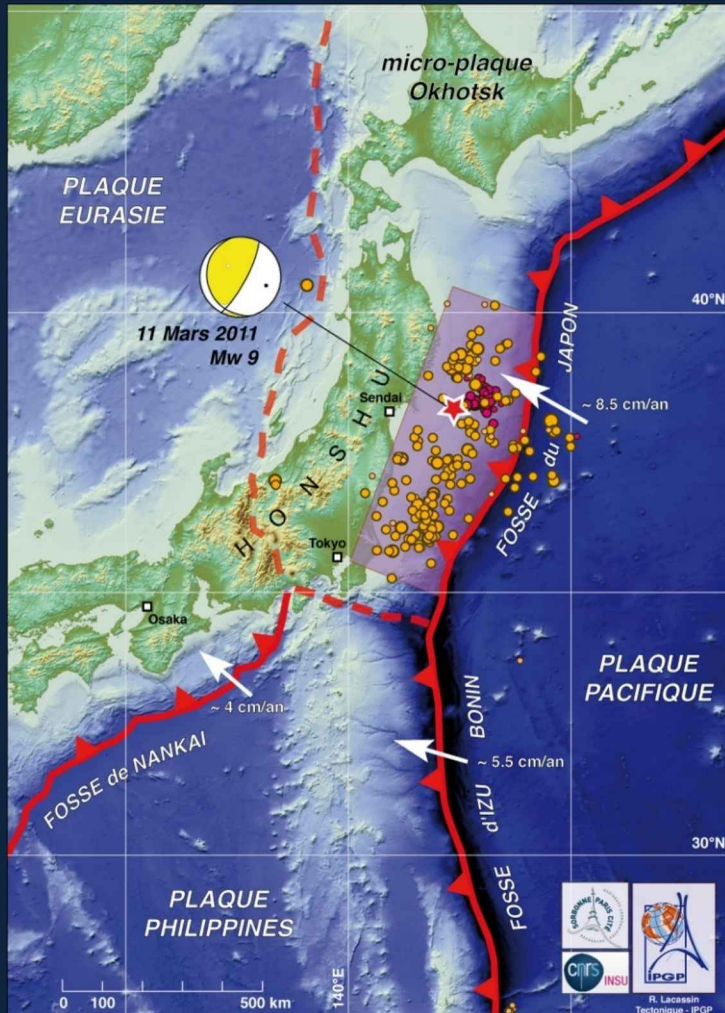


J-Rapid Symposium Flash Japon Sendai, 6-7 March 2013



Group1
Geosciences

Projects

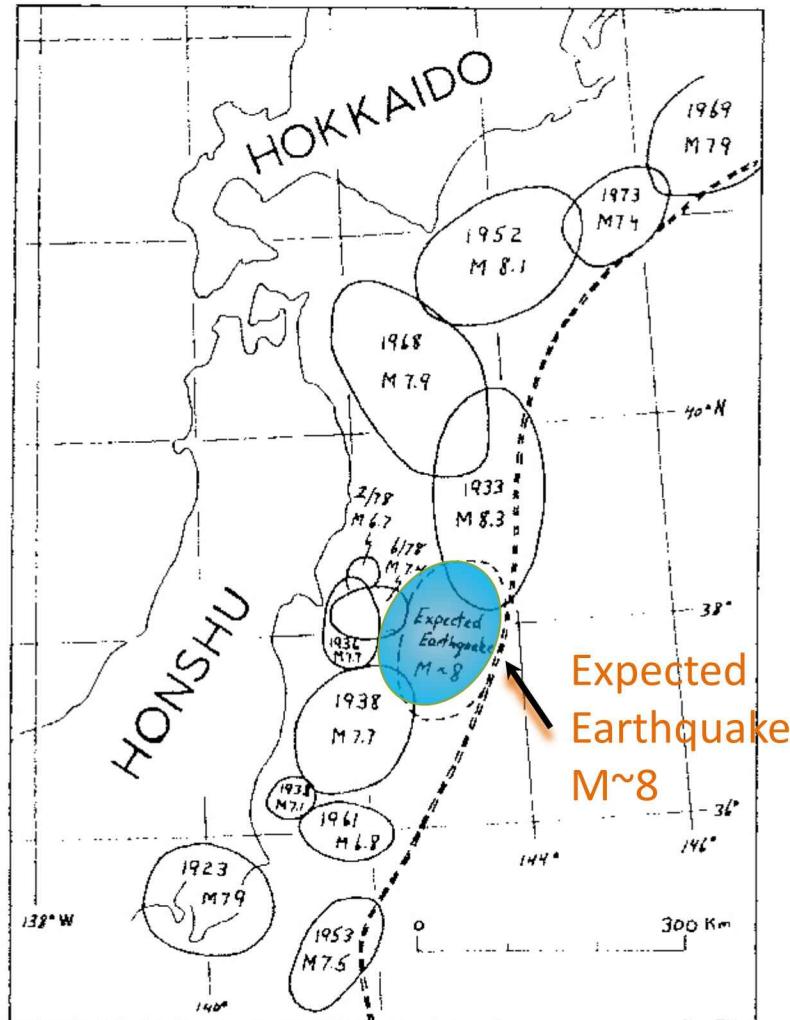
- Rapid response geophysical survey in the fault zone. Sh. Kodaira and G. Moore (U.S.A.)
- Urgent surveys for evacuation measures from unexpected large tsunami . K. Satake and H. Harjono (Indonesia)
- Evaluation potential of large aftershocks. Yo Fukushima P. Segall (U.S.)
- DYNTOHOKU. S. Ide and R. Madariaga (France)
- Tohoku Oki from Earth to Oceans and Space Sh Watada and A. Sladen (France)
- Crustal seismic velocity changes and deformation T. Nishimura and F. Brenguier (France)
- Paleoseismology and paleotsunamis of the NE Japan subduction zone. Sh. Toda and M. Meghraoui (France)

Major questions about the Tohoku earthquake

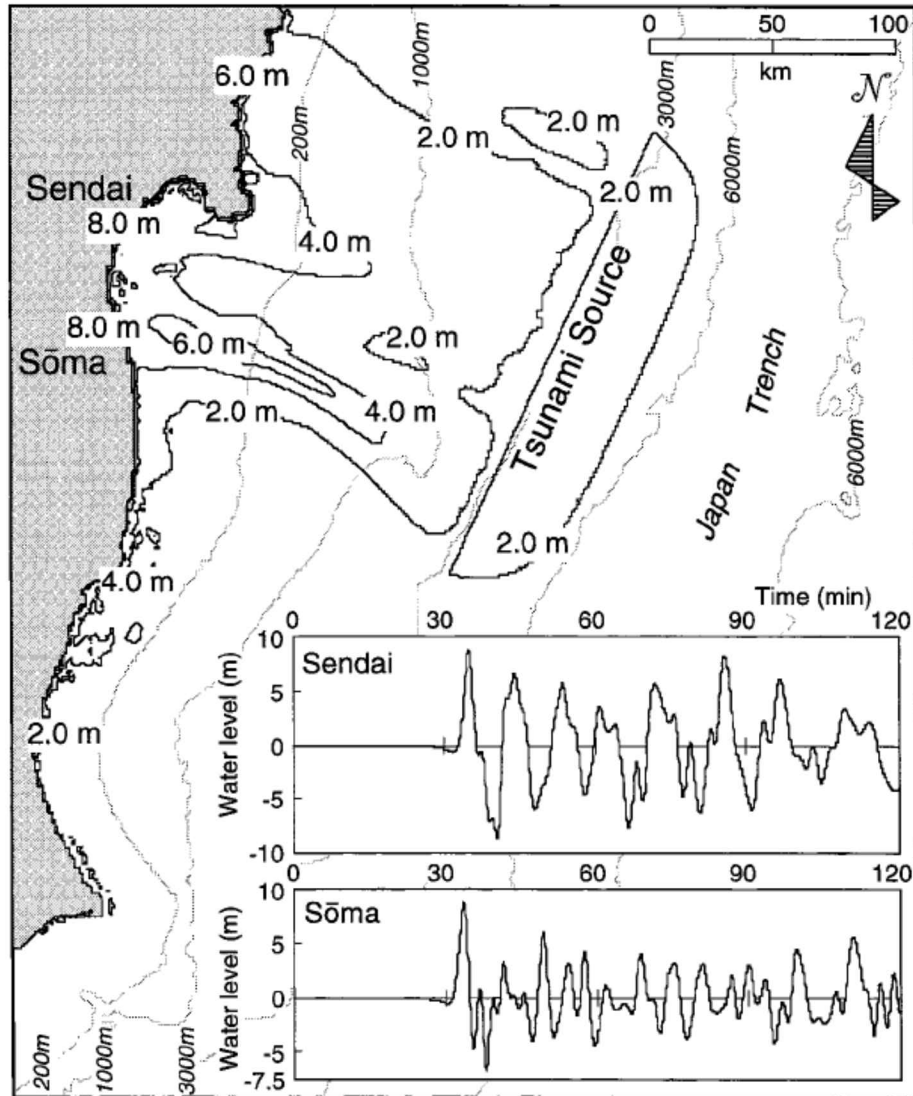
1. Why was it unexpected?
2. What did actually happen and will happen?
3. Why did it grow to be so big?
4. How can we better observe future
mega-thrust earthquakes ?

Why did we not expect it?

Interpretation of Historical seismicity of Tohoku



Simulation of a possible tsunami source based on Jogan Earthquake of 869



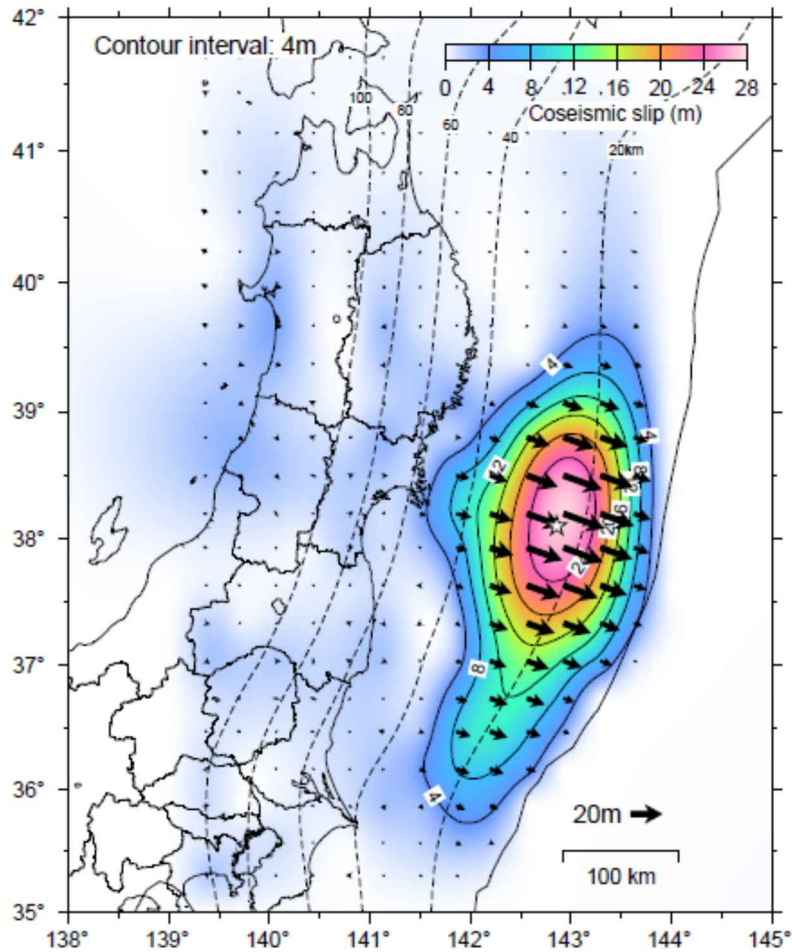
Improved paleoseismology

Toda and Meghraoui

What did actually happen?

Many

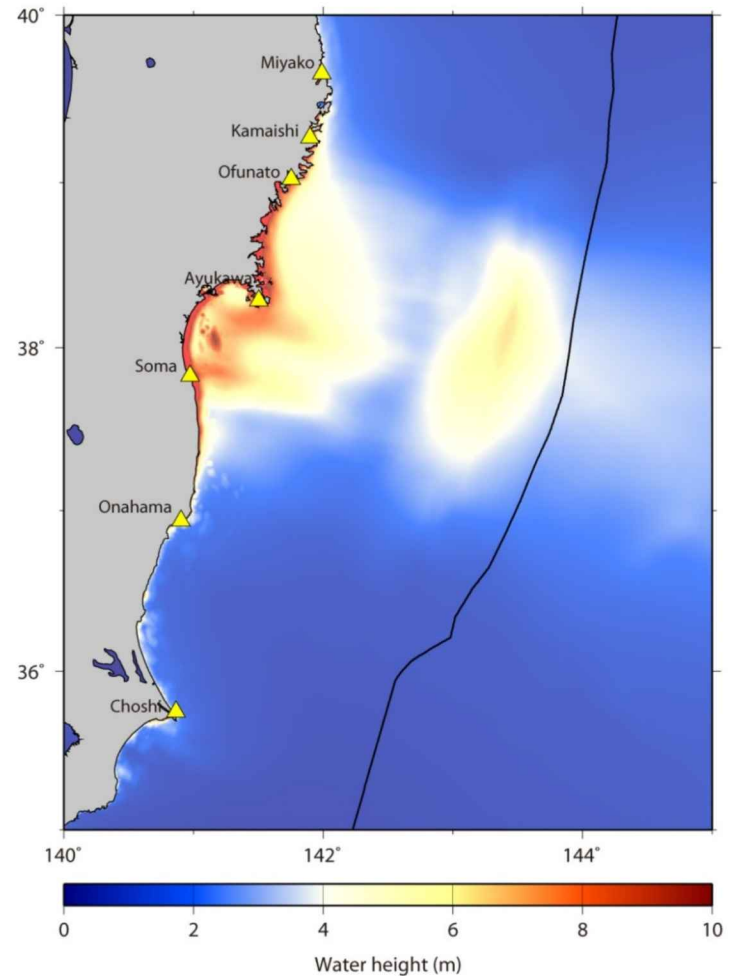
Slip on the fault



Nishimura et al, 2011-13

Satake Harjono

Tsunami height



Fujii-Satake, 2011

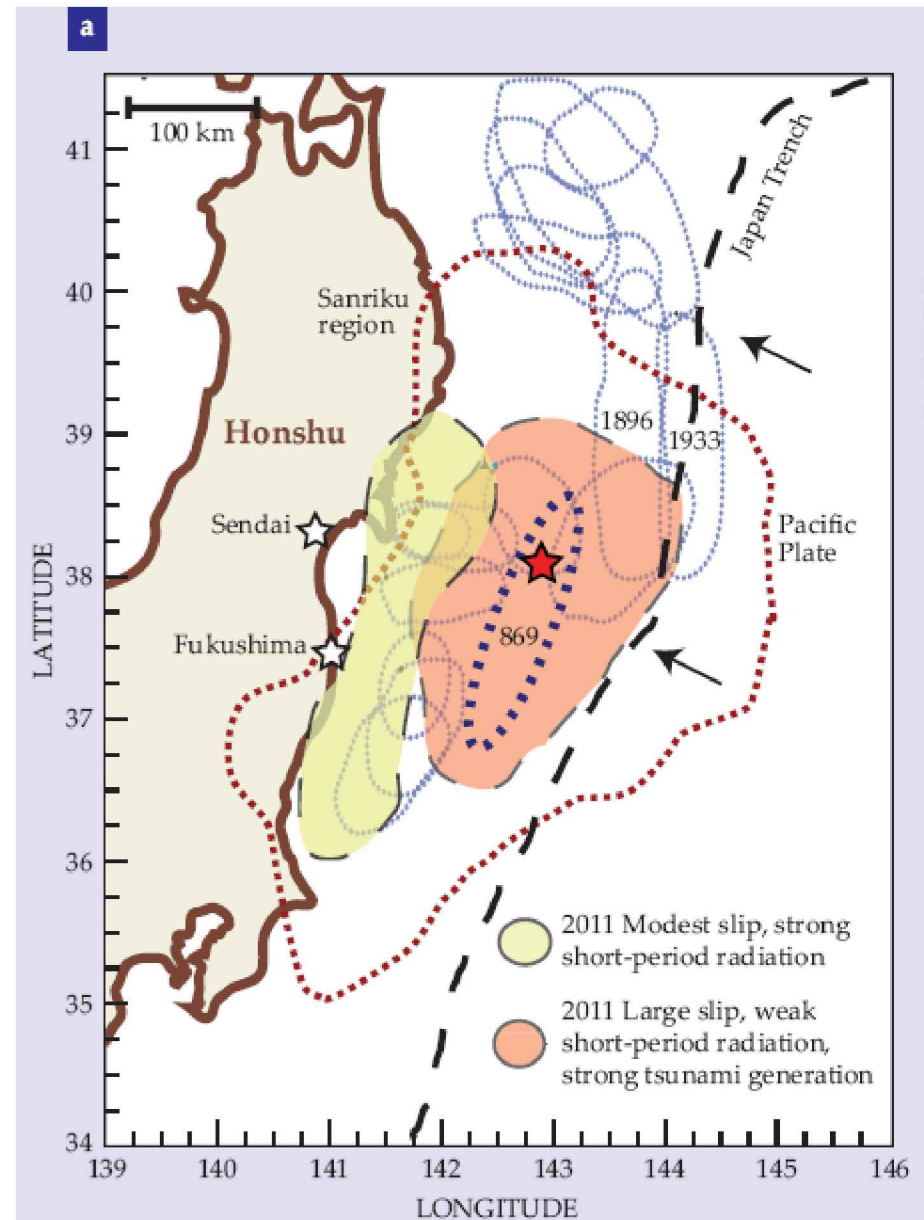
What did actually happen?

The source of high frequencies is not the same as the source of low frequencies.

Ide and Madariaga

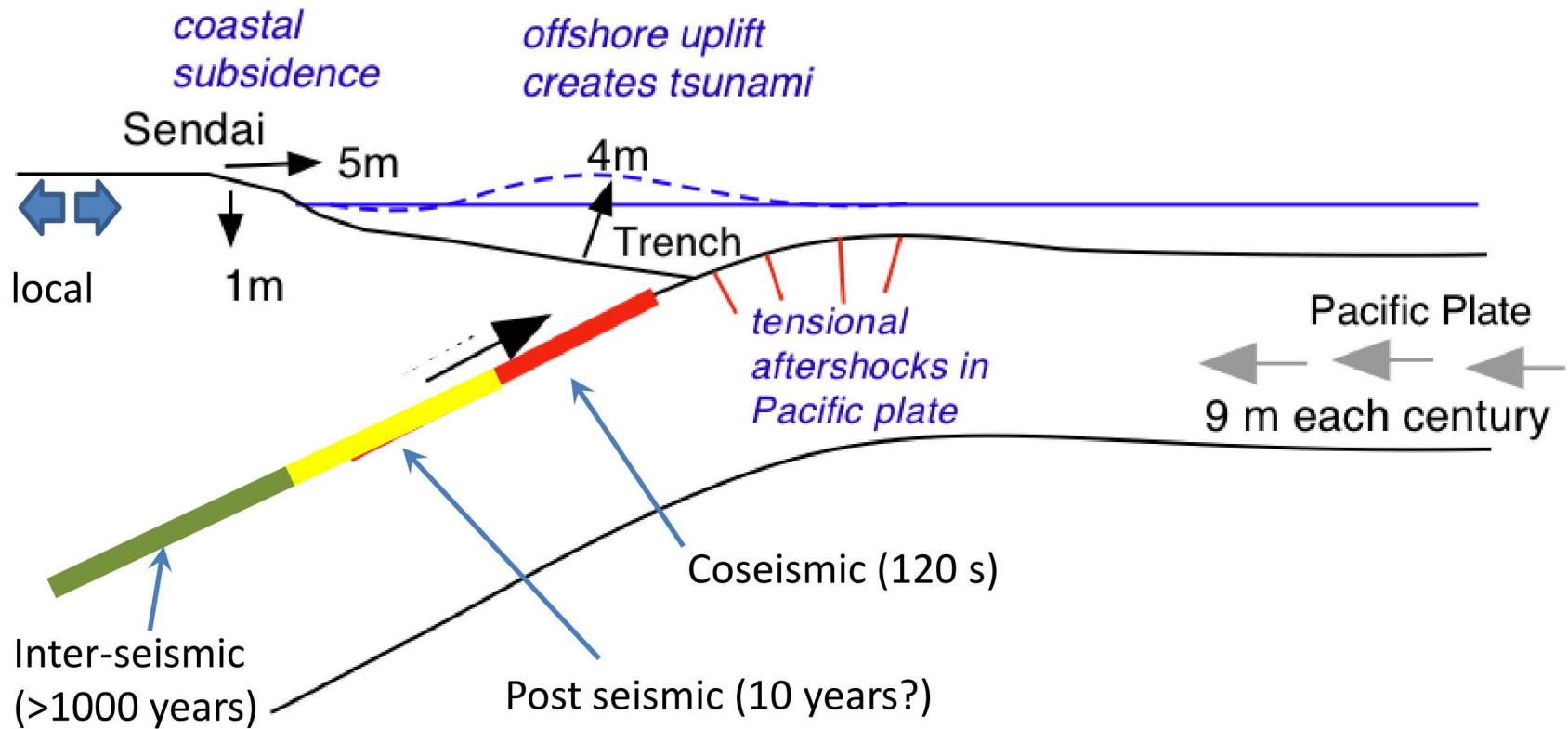
Satake Harjono

(Nishimura Brenguier)



What did actually happened and will happen?

Geodesy



From Roger Bilham,

<http://cires.colorado.edu/~bilham/Honshu2011/Honshu2011.html>

1. What did actually happen and what will happen ?

We only have 20 years of geodetic data for an earthquake that took at least 1000 to prepare. And we can only observe in the surface.

Fukushima Segall classical and modern geodesy

Ide Madariaga GPS near and far field

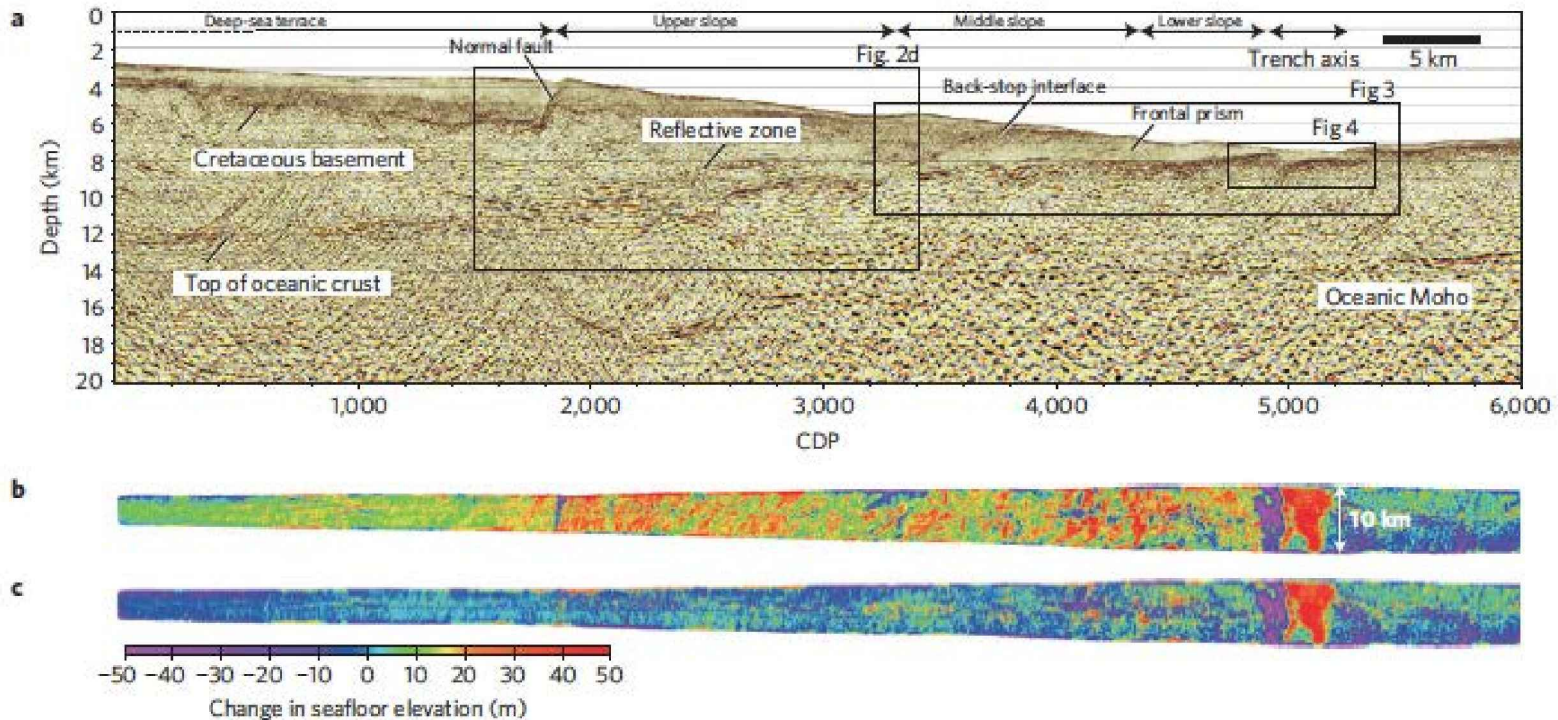
Nishimura Brenguier local GPS

Toda Meghraoui coastal deformation

Why did it grow to be so big?

Kodaira and G.F. Moore

Ide and Madariaga



Affects rupture process (Ide+Madariaga)

Affects tsunami generation (Satake+Harjono

Watada+Sladen)

How can we better observe future mega-thrust earthquakes ?

Use space observations: infrasounds, GPS observed in the upper atmosphere, etc

Watada-Sladen

Detect velocity changes using seismological methods (coda waves, noise crosscorrelations)

T. Nishimura, F. Brenguier