

Plate Boundary Fault of the Tohoku-oki Earthquake

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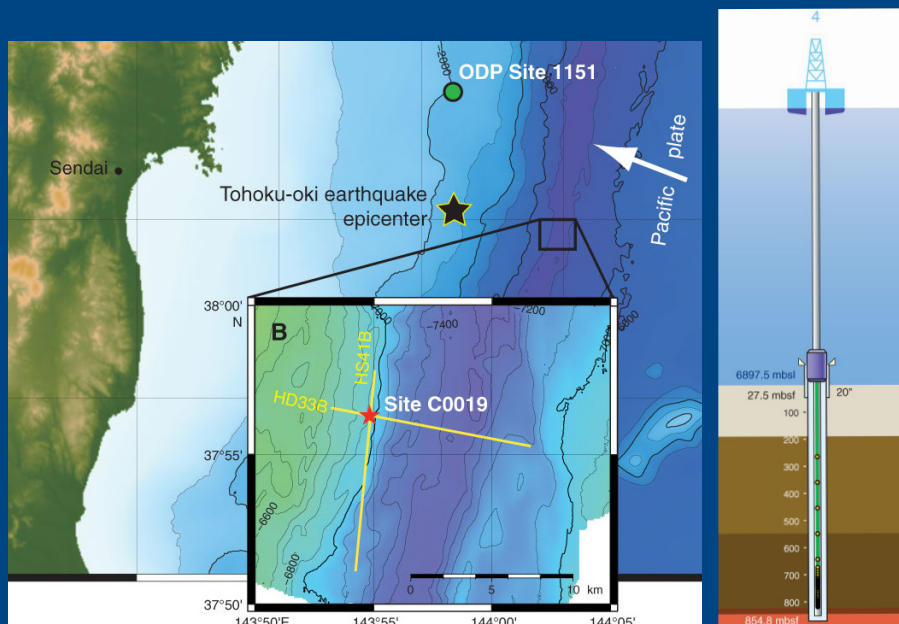
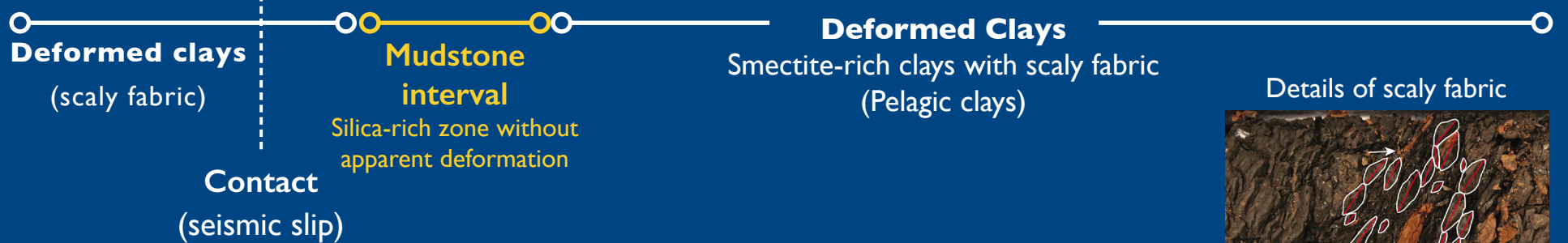
Japan Trench Fast Drilling Project - IODP Expedition 343

One year after the devastating Tohoku-oki earthquake, the drillship **Chikyu** recovered rock samples from the plate boundary fault, 200 km offshore the Miyagi Prefecture (Honshu), 850.5 m beneath the seafloor (mbsf) and at a water depth of about 7 km.

Top

821.5 mbsf

822.5 mbsf



Expedition 343 drillsite - the earthquake is located in the Japan Trench at the boundary of the North American and Pacific plates.

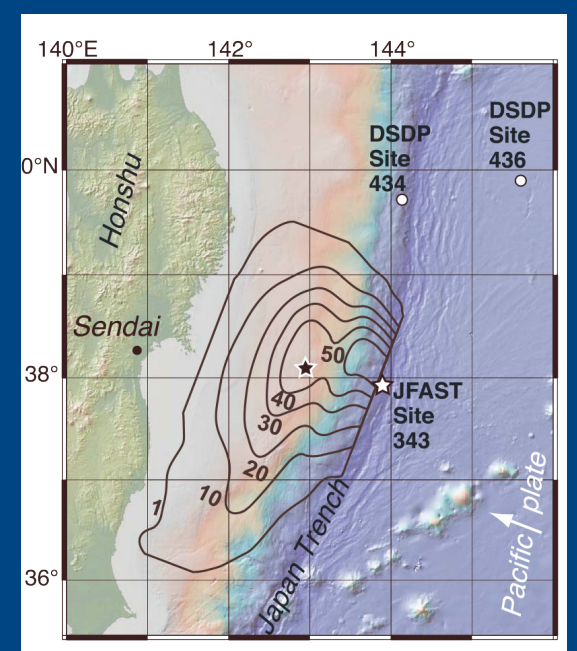


Technological challenges and multiple scales: drillpipe length of about 8 km and > 350 tons, localising the plate boundary fault zone of <5 m thick and identifying centimetric to millimetric deformation as a track of the seismic slip.

A very large slip on the shallow part of the plate boundary fault generated a tsunami that devastated the NE coast of Honshu.

The frictional properties of the clay has consequences on the characteristics of the earthquake in a subduction zone.

References: Kirkpatrick et al., 2014. AGU Publications - Tectonics - doi:10.1002/2014TC003695
Chester et al., 2013. Science - doi:10.1126/science.1243719
Blue Earth #118 - 2011 Tohoku Earthquake, JAMSTEC publications



Seafloor displacement: 50 m ESE (horizontal) et 7-10 m (vertical).



<http://www.iodp.org>
<http://www.jamstec.go.jp/chikyu/e/>