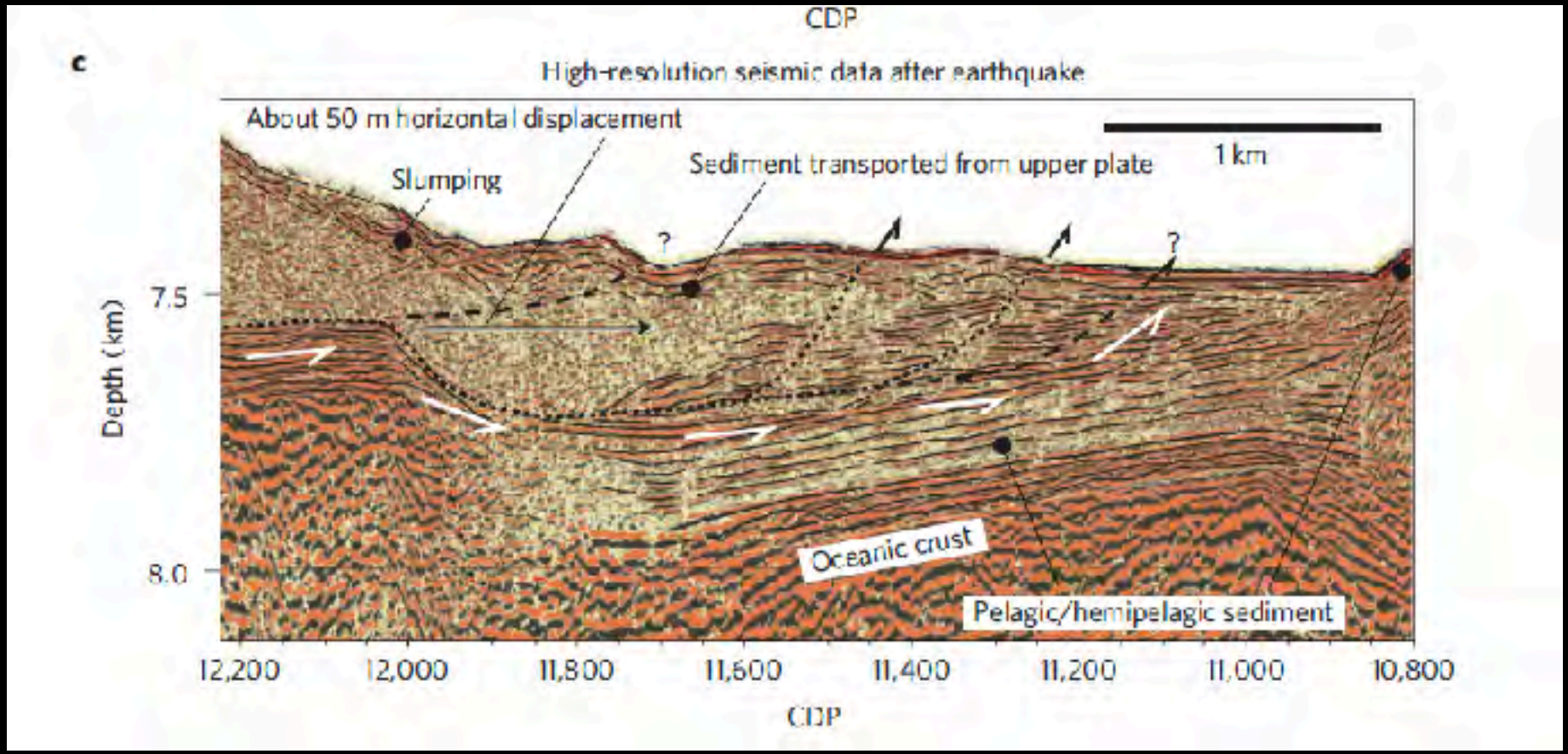
Recovering the Long-term Paleoseismic-tsunamic Record by Scientific Ocean Drilling (IODP)

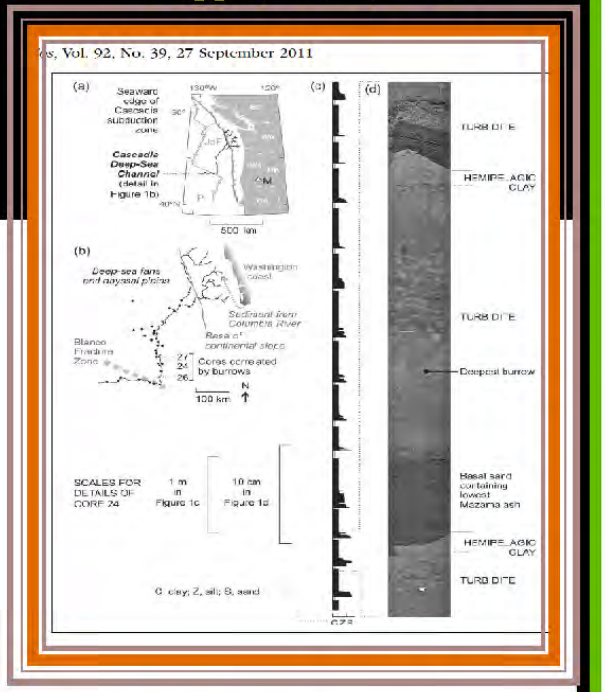
HOW DO WE DO THIS ?

WHERE DO WE DO THIS?

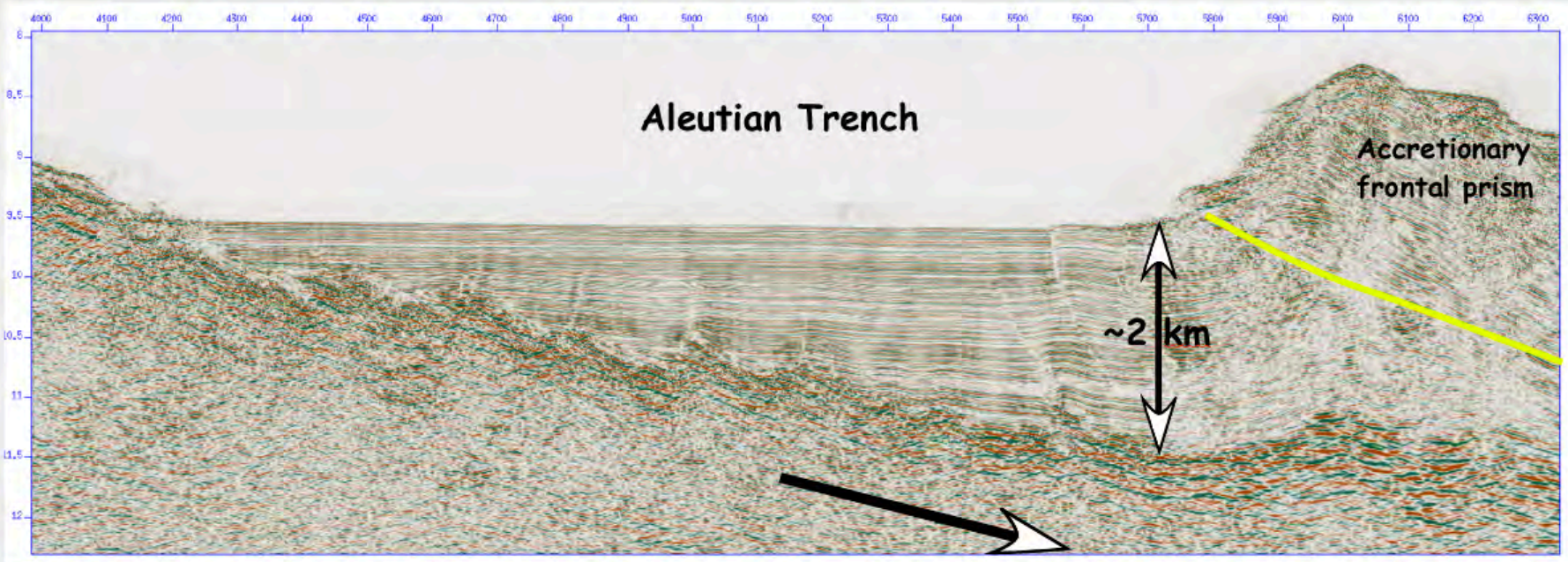


Turbidite sequences in Forearc Basin and Axial Trench Deposits

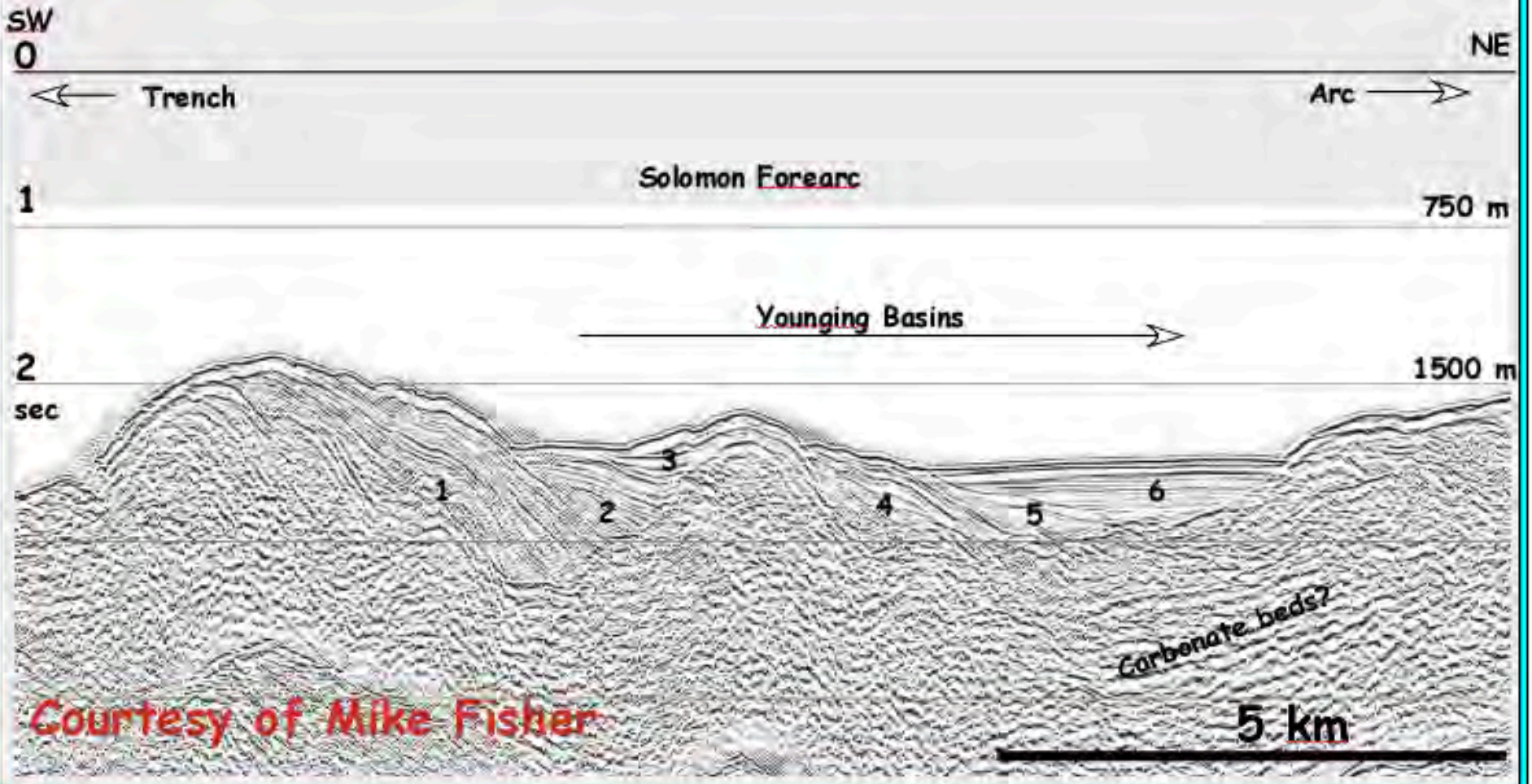
Griggs, EOS, 2011



Trench-axis Turbidite Deposits Expected to Register Both Aleutian and Alaskan Sources

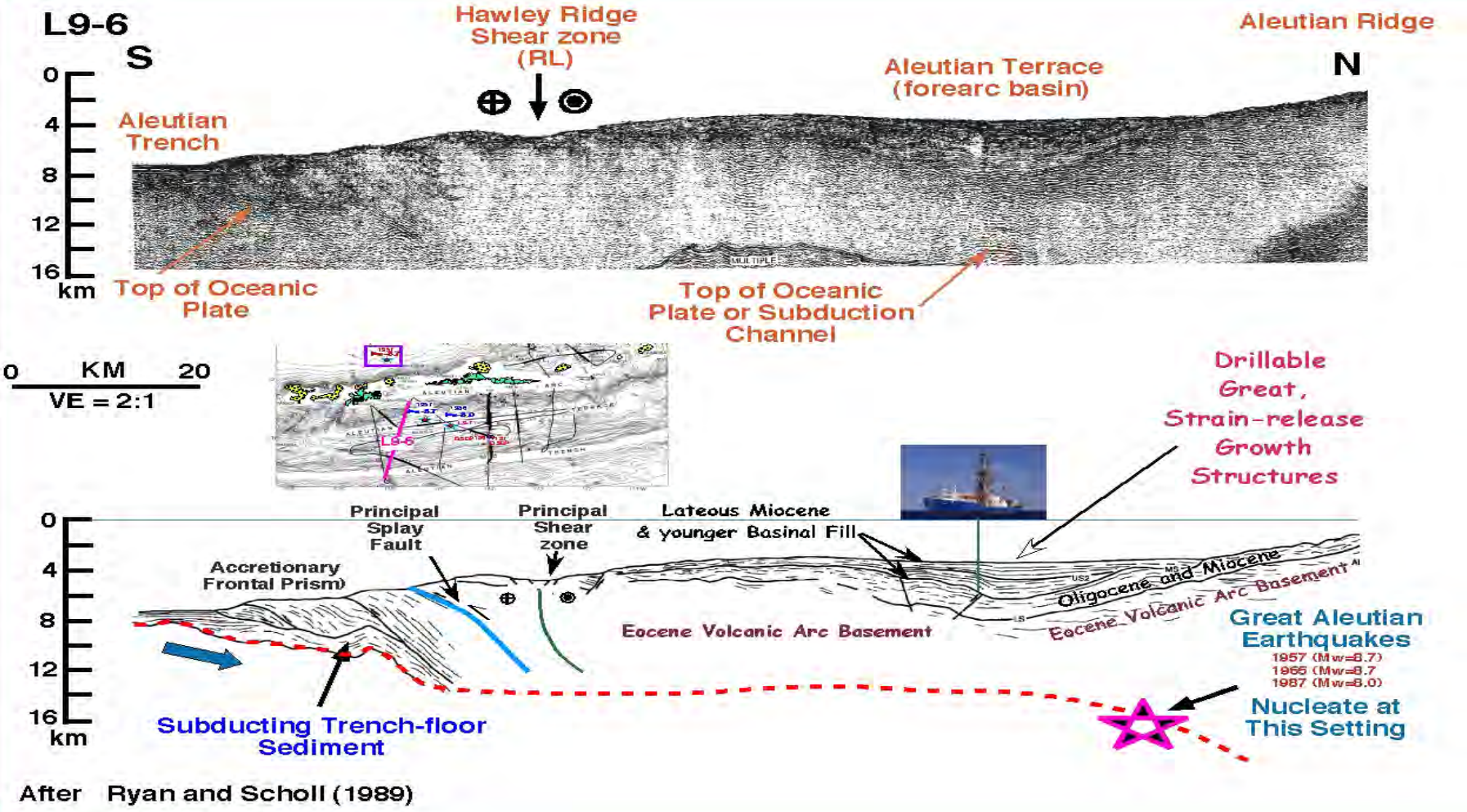


Are Forearc Growth Structures Recorders of High-magnitude Paleoseismicity?

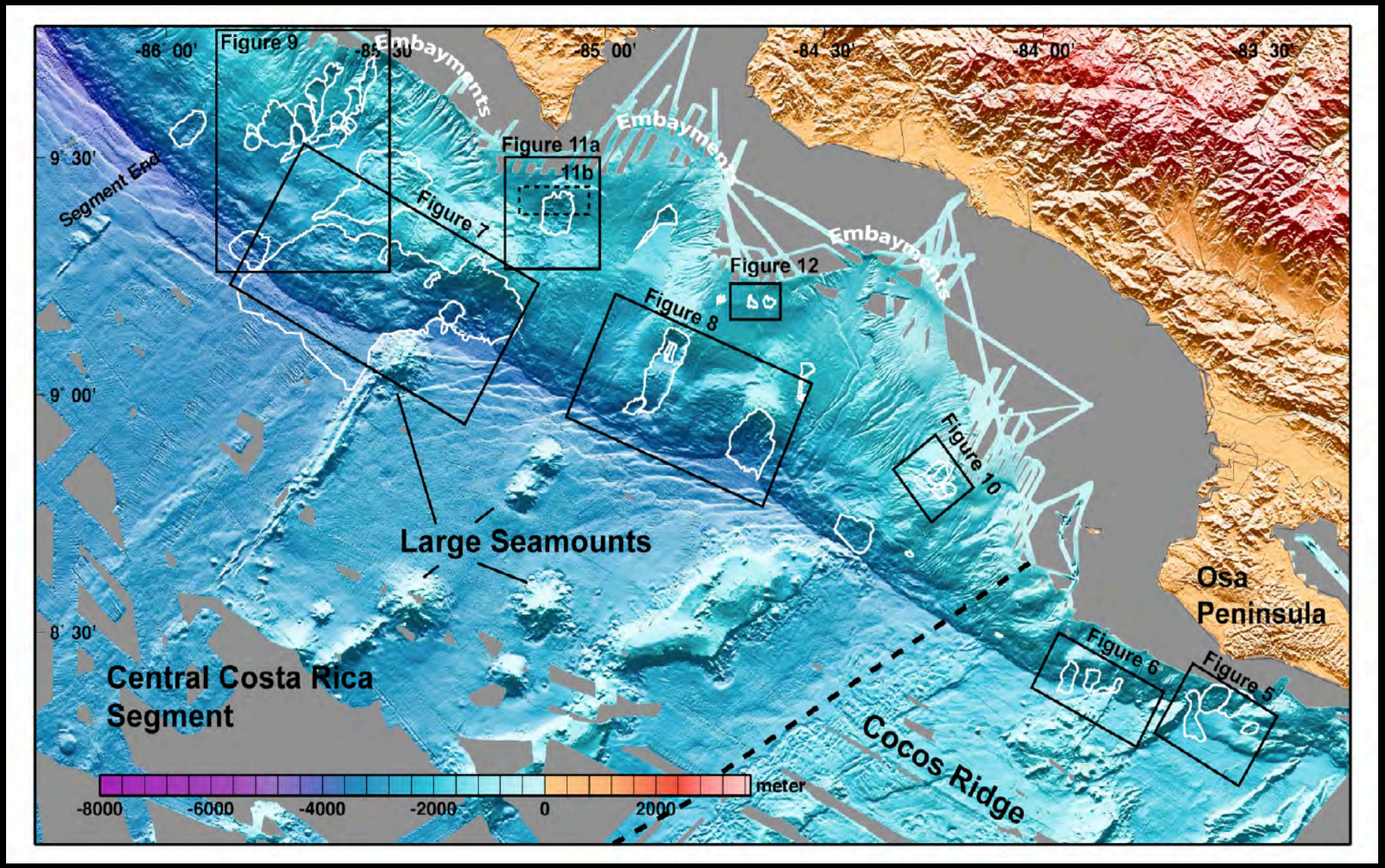


Courtesy of Mike Fisher

Are Growth Structures in Forearc Basins Recorders of High-magnitude Paleoseismicity?

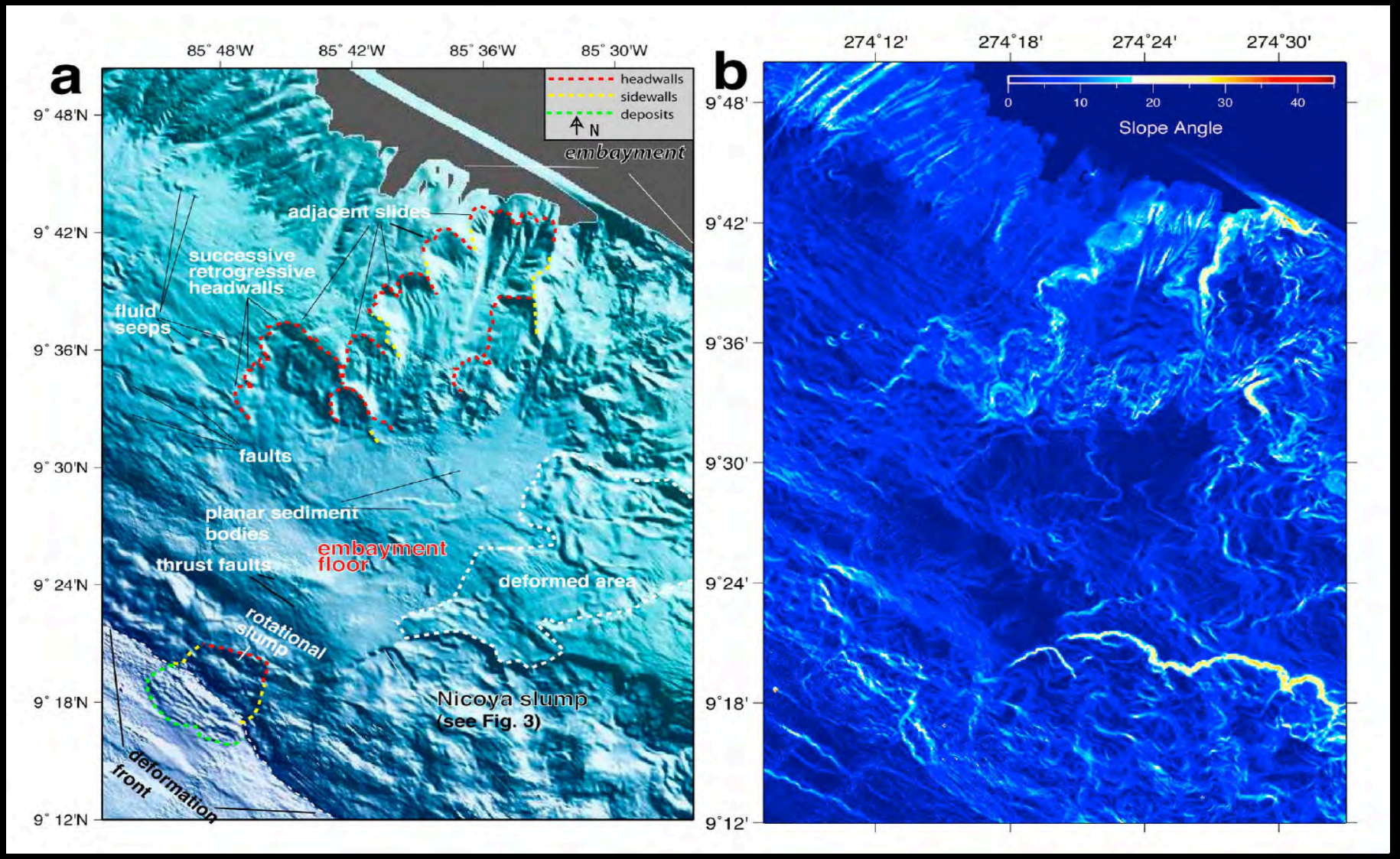


Are Many/Most Slope Failures Launched By High-magnitude Megathrust Shaking ?

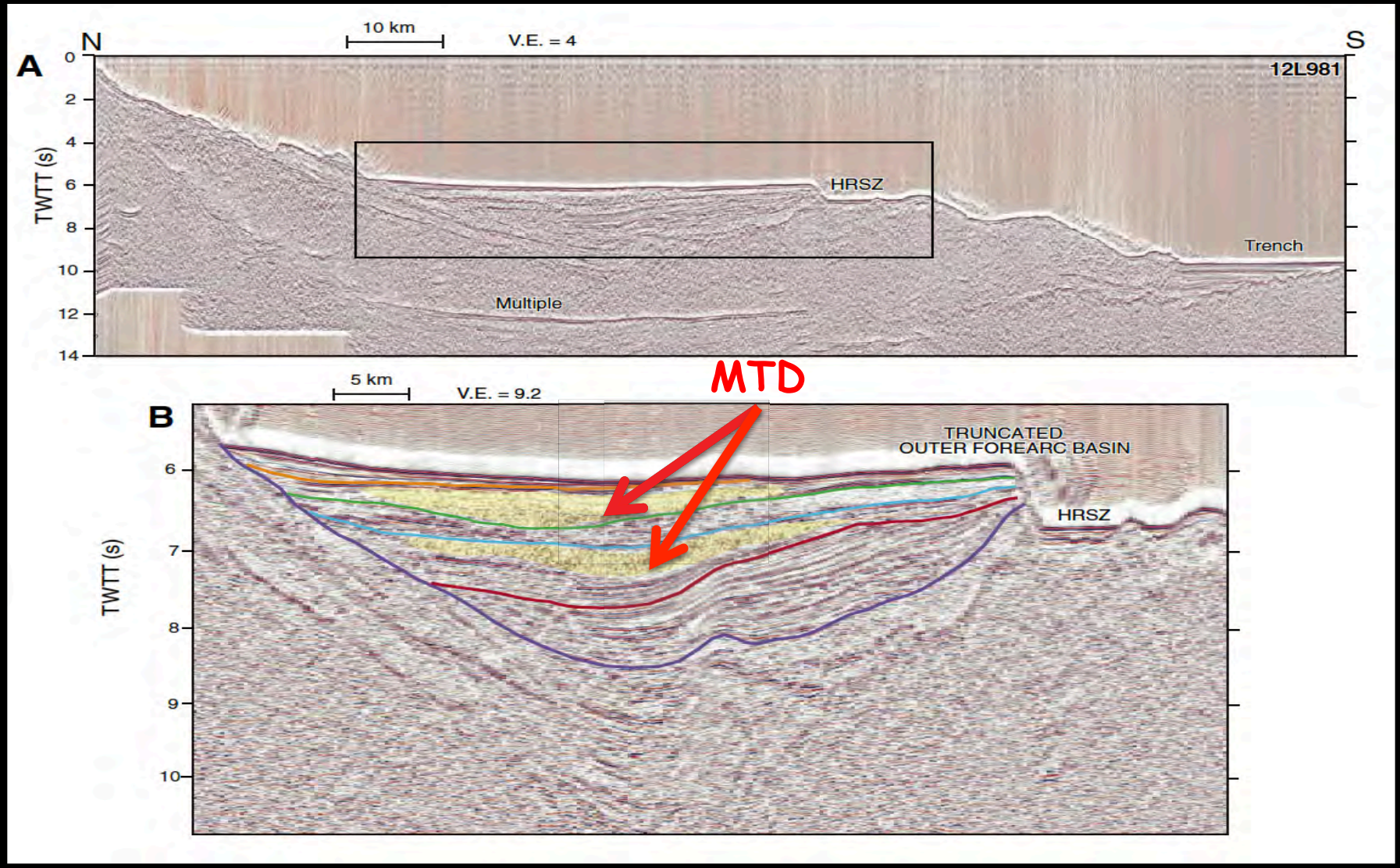


Harder et al., 2010 (G-cube)

Retrogressive Failures (i.e. breaking later farther up slope) and the Recording of Successive High-Magnitude Earthquake Shaking

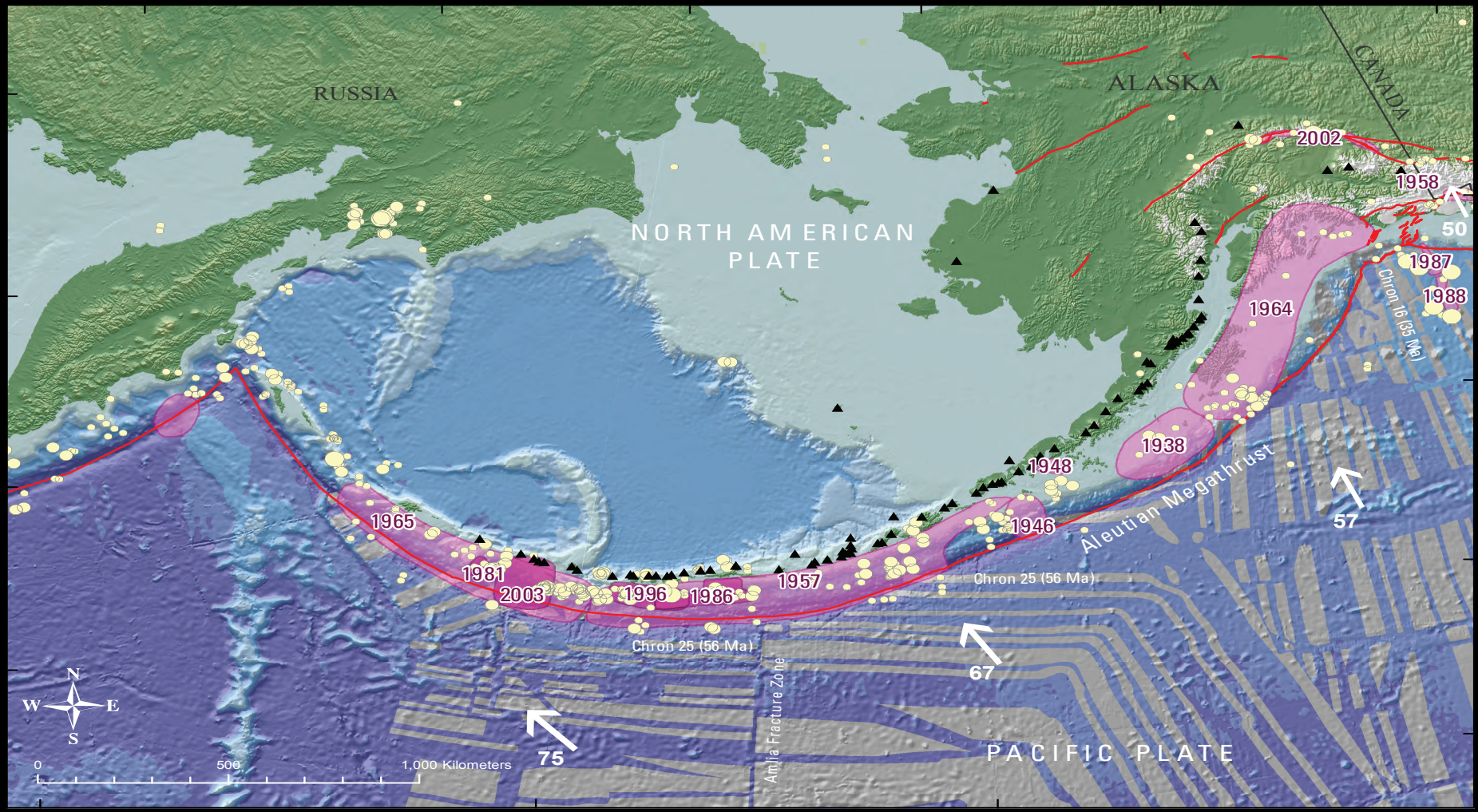


Mass-Transport Deposits (MTDs) and the Recordering of High-Magnitude Forearc Shaking



Holly Ryan et al, In press, GSA Special Normark Geosphere Volume

WHERE TO GO ?

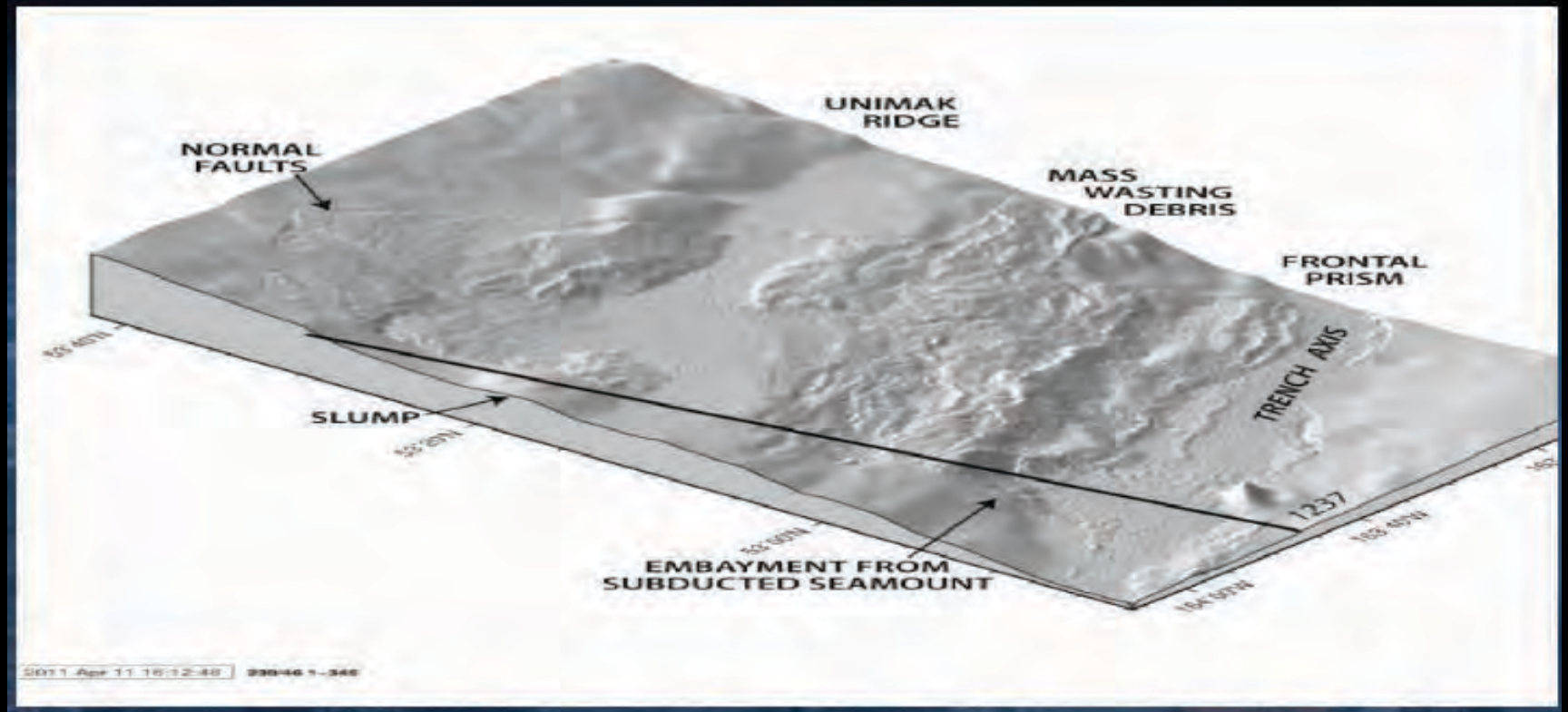

RUSSIA
ALASKA
CANADA
NORTH AMERICAN PLATE
PACIFIC PLATE
2002
1958
1987
1988
1964
1938
1948
1946
1957
1986
1996
2003
1981
1965
Aleutian Megathrust
Chron 16 (35 Ma)
Chron 25 (56 Ma)
Chron 25 (56 Ma)
Amlia Fracture Zone
50
57
67
75
N
W
E
S
0
500
1,000 Kilometers

Alaska Setting for the Disastrous 1946, Trans-Pacific, Scotch Cap Tsunami.

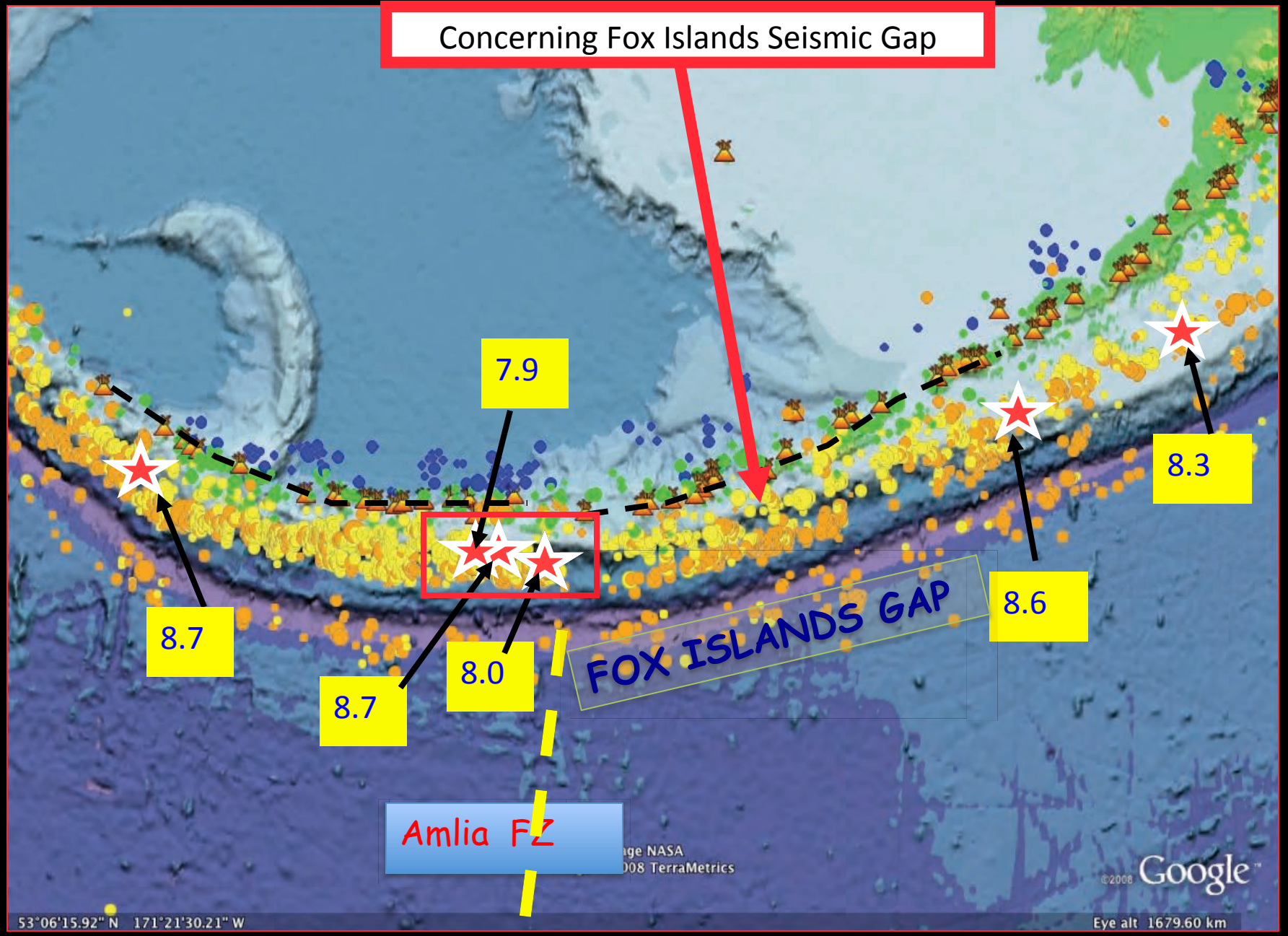
A Target Area to Study the Launching of Humongous Tsunamis by:

* Slope-failure ?

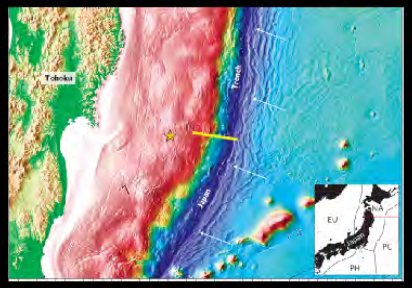
* Near-Trench, up-dip Rupturing ?



Courtesy of Roland von Heune

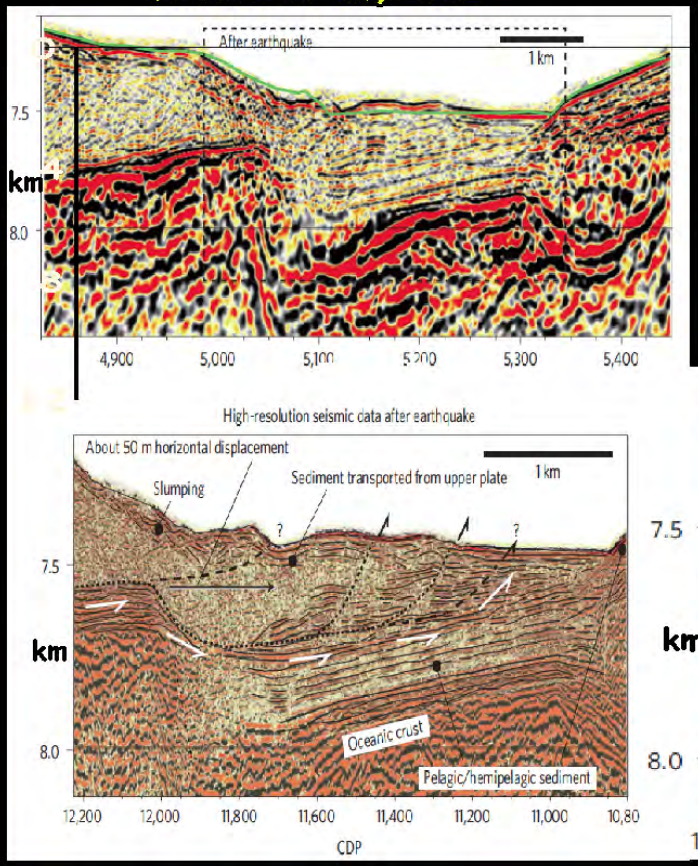

Concerning Fox Islands Seismic Gap
7.9
8.3
8.7
8.6
8.7
8.0
FOX ISLANDS GAP
Amlia FZ
53°06'15.92" N 171°21'30.21" W
Eye alt 1679.60 km
Google

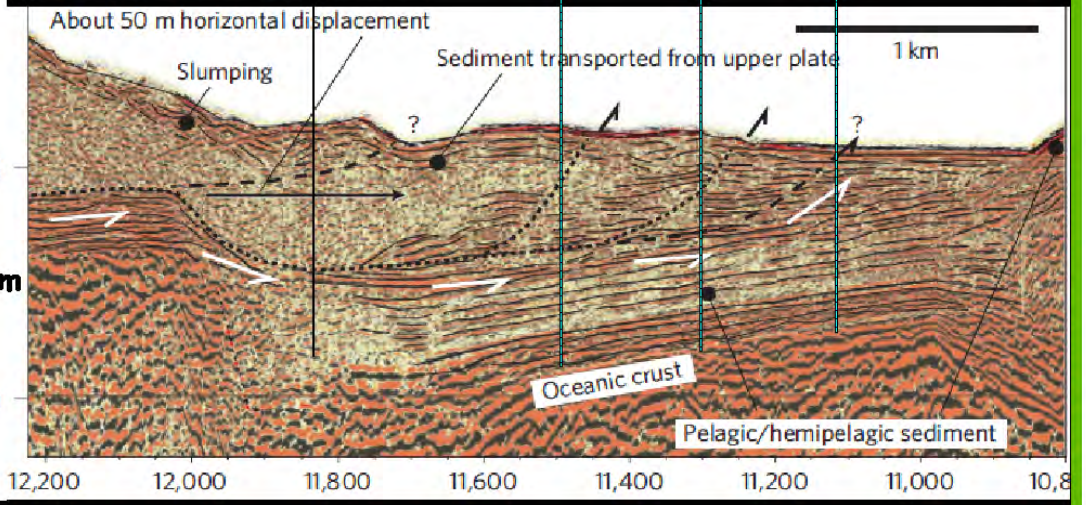
Tohoku outer forearc



The paleoseismic record of Tohoku-style tsunami-generating ruptures of the deep-water, up-dip sector of the seismogenic zone should be recoverable from the trench floor and frontal prism

Kodaira et al., 2012





To Present Data, Ideas, Concepts and Strategize About

How We Recover and Read the Offshore Paleoseismic-tsunamic Record of the Aleutian, Alaska, Cascadia, and Hikurangi Subduction Zones