The background of the slide is a painting of a tsunami wave. The wave is depicted with vibrant, swirling colors of blue, green, and yellow, suggesting a powerful and turbulent force. In the upper left corner, a small portion of a coastal town is visible, with buildings and a church steeple. The overall scene conveys the scale and impact of a tsunami.

The USGS Tsunami Source Working Group: Current Activities and Current and Potential Future Collaborations

**Stephen Kirby
Co-Founder and Scientist Emeritus**

**NTHMP Meeting
30 January 2014
Menlo Park USGS**

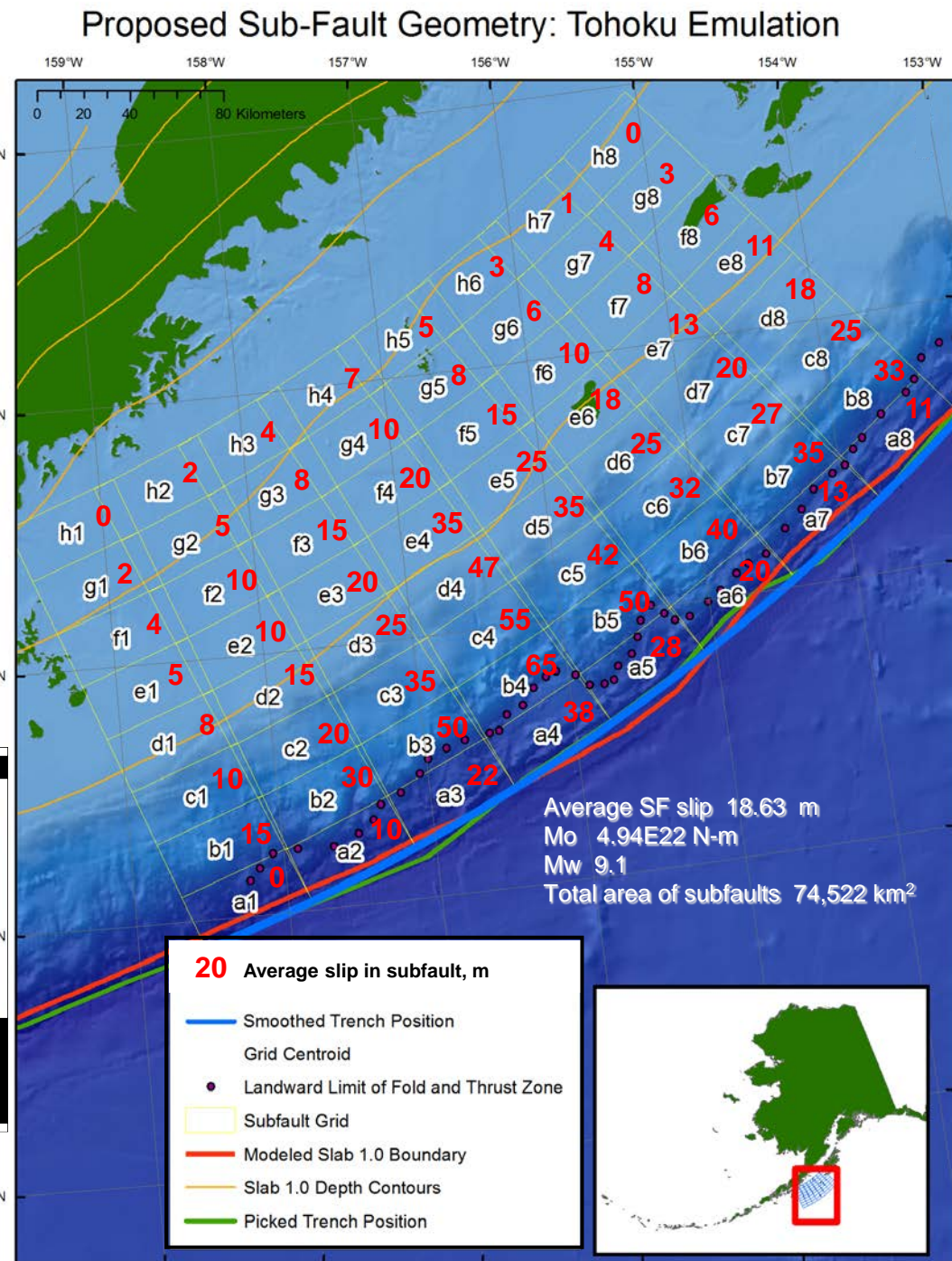
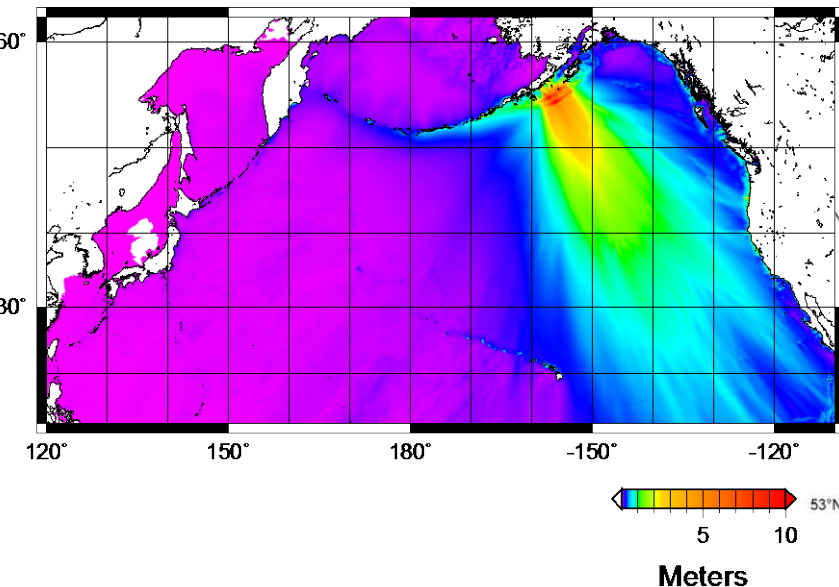
List of Current Activities & Collaborations

1. MHDP/SAFRR Tsunami Scenario for California coastlines. **TSWG**
2. Reprocessing of legacy seismic reflection lines and swath mapping bathymetry in Alaska Peninsula and Aleutians. **von Huene & Miller.**
3. Pilot paleotsunamic and seismic survey in Waipio Valley, Big Island, HI. **Kirby, Goff, Chagraff-Goff, Fryer, Dudley, Catchings, Jaffe, Delonghi, Arcos, ...**
4. Global megathrust EQ tsunami hazard appraisal based on the instrumental and historical seismic record and marine geoscience. **Scholl, Kirby, and Okal**
5. Seismic source characterization for splay and popup EQ sources off Sumatra with tsunami implications: **Choy, Kirby, Hayes, & Plafker.**
6. Great off-trench normal-faulting earthquakes and tsunamis: 1933 M8.6 tsunamigenic EQ Japan and elsewhere. **Kirby, Okal, Uchida, Hino, and Wartman.**
7. Reappraisal of seismic moments of great tsunamigenic earthquakes in the predigital era (1907 Java, 1922 Chile, 1923 Kamchatka, 1945 Makran, 1952 Kamchatka, & 1957 Aleutians) **Okal, Kirby, Lee, & Kanamori**

1. MHDP/SAFRR Tsunami Scenario for California coastlines, 2014.

Kirby, Scholl, von Huene, and Wells, 2013 Posited Tsunami source.

Source EQ: Subfault Geometry and Slip Distribution:
M9.1 Tohoku Emulation V4:
Tsunami Scenario for CA shorelines.



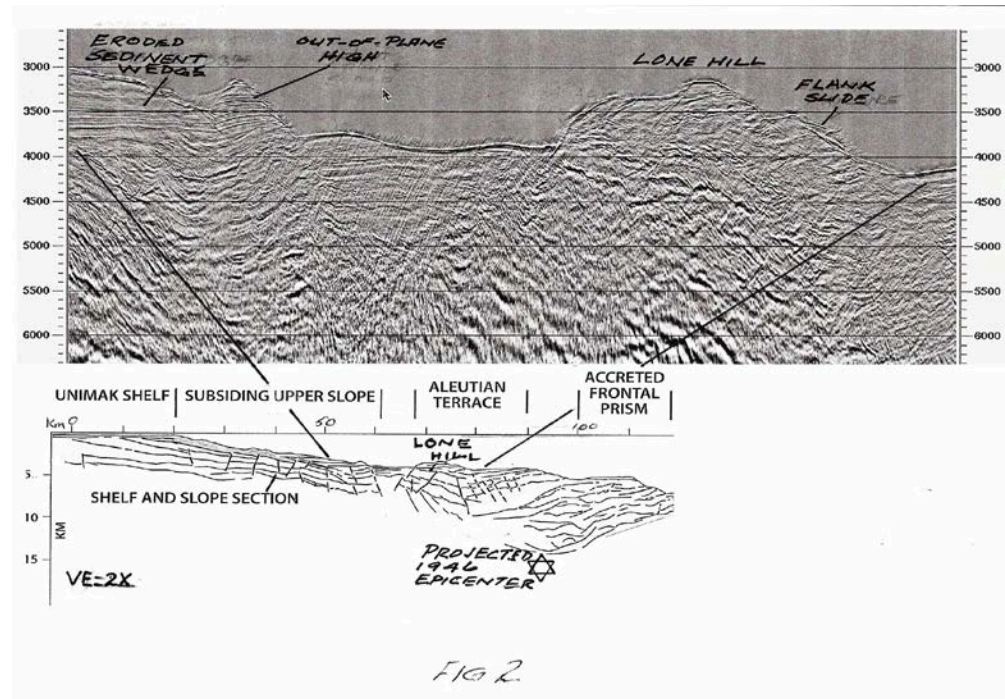
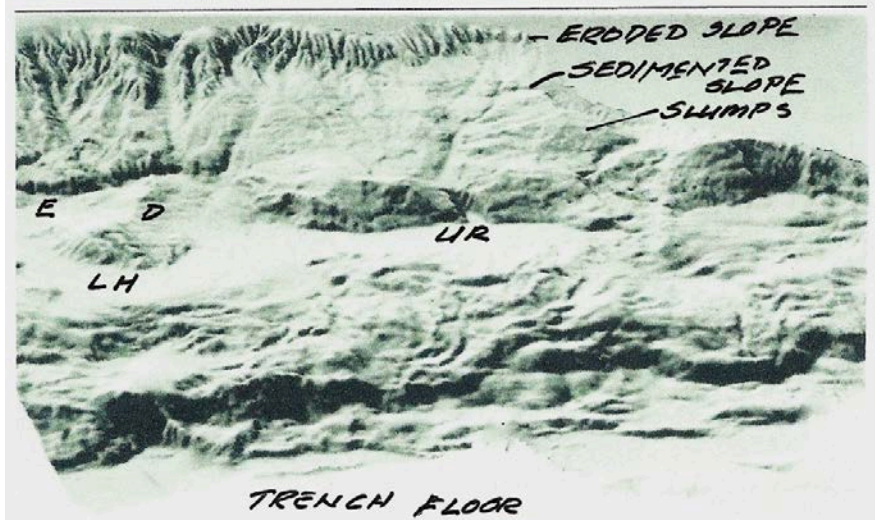
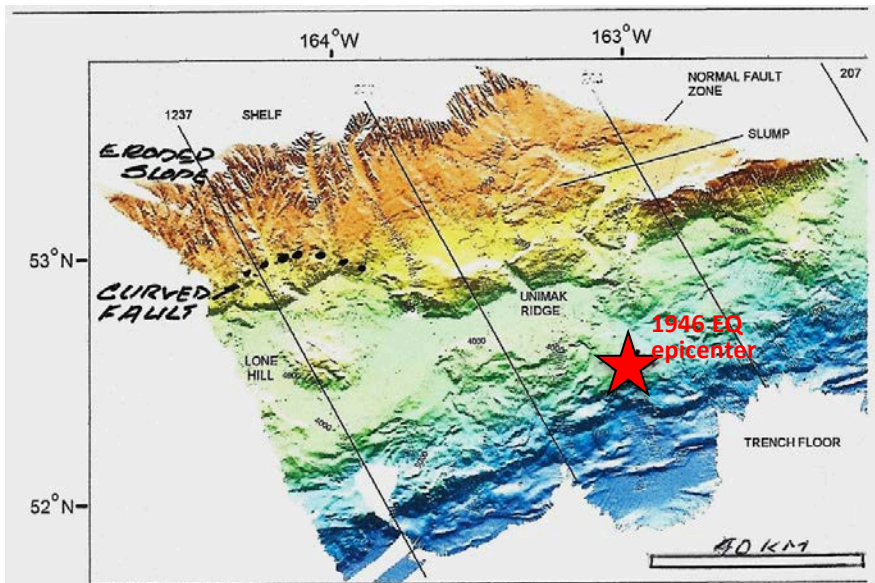
Alaska Earthquake Source for the SAFRR Tsunami Scenario



Open-File Report 2013–1170–B
California Geological Survey Special Report 229

Alaska earthquake source for the
SAFRR tsunami scenario: Chapter B in
*The SAFRR (Science Application for
Risk Reduction) Tsunami Scenario*.
2013, Kirby, Stephen; Scholl, David;
von Huene, Roland; Wells, Ray
USGS Open-File Report: 2013-1170-B
[USGS Publication Warehouse]

2. Reprocessing of legacy seismic reflection lines and swath mapping bathymetry in Alaska Peninsula and Aleutians.
von Huene & Miller. Discovery if 1946 tsunami slump source.
 Support of NSF GeoPRISMS investigations in the Aleutians.



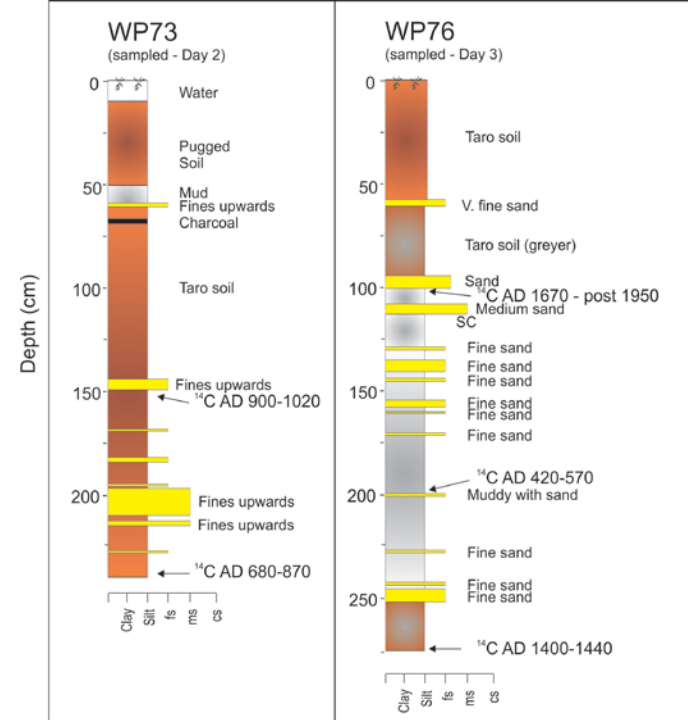
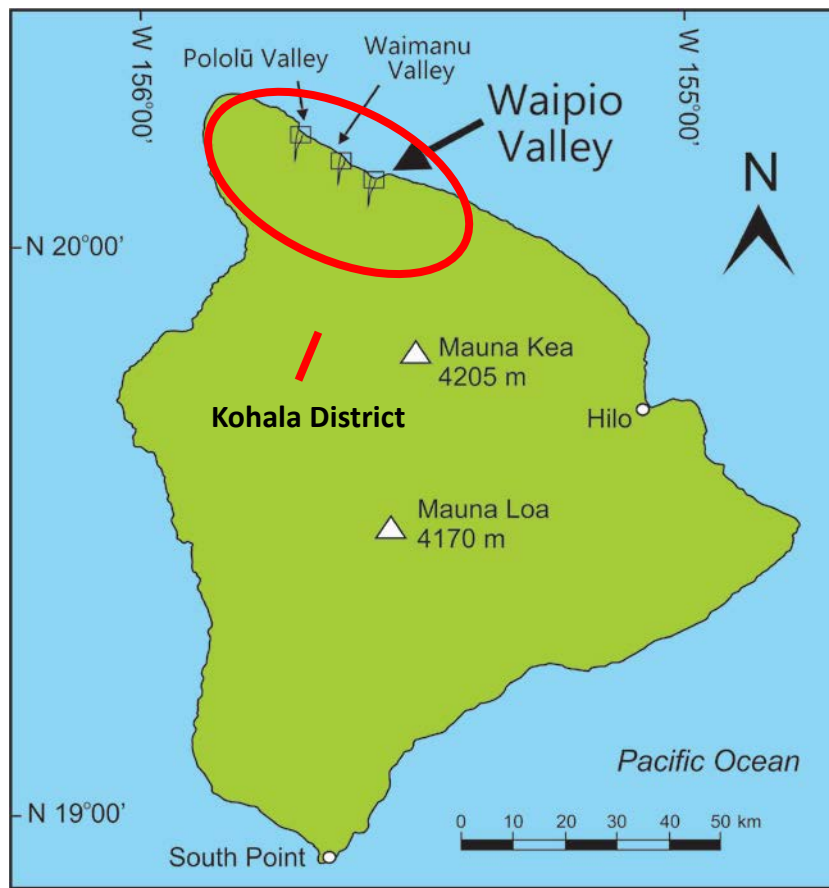
Miller, John and von Huene, Roland, 2014.
THE 1946 UNIMAK NEAR-FIELD TSUNAMI ENIGMA REVISITED, To be submitted to the Journal Nature Geoscience, February.

4. Pilot paleotsunamic and seismic survey in Waipio Valley, Big Island, HI. Kirby, Goff, Chagraff-Goff, Fryer, Dudley, Catchings, Jaffe, + 6 more.



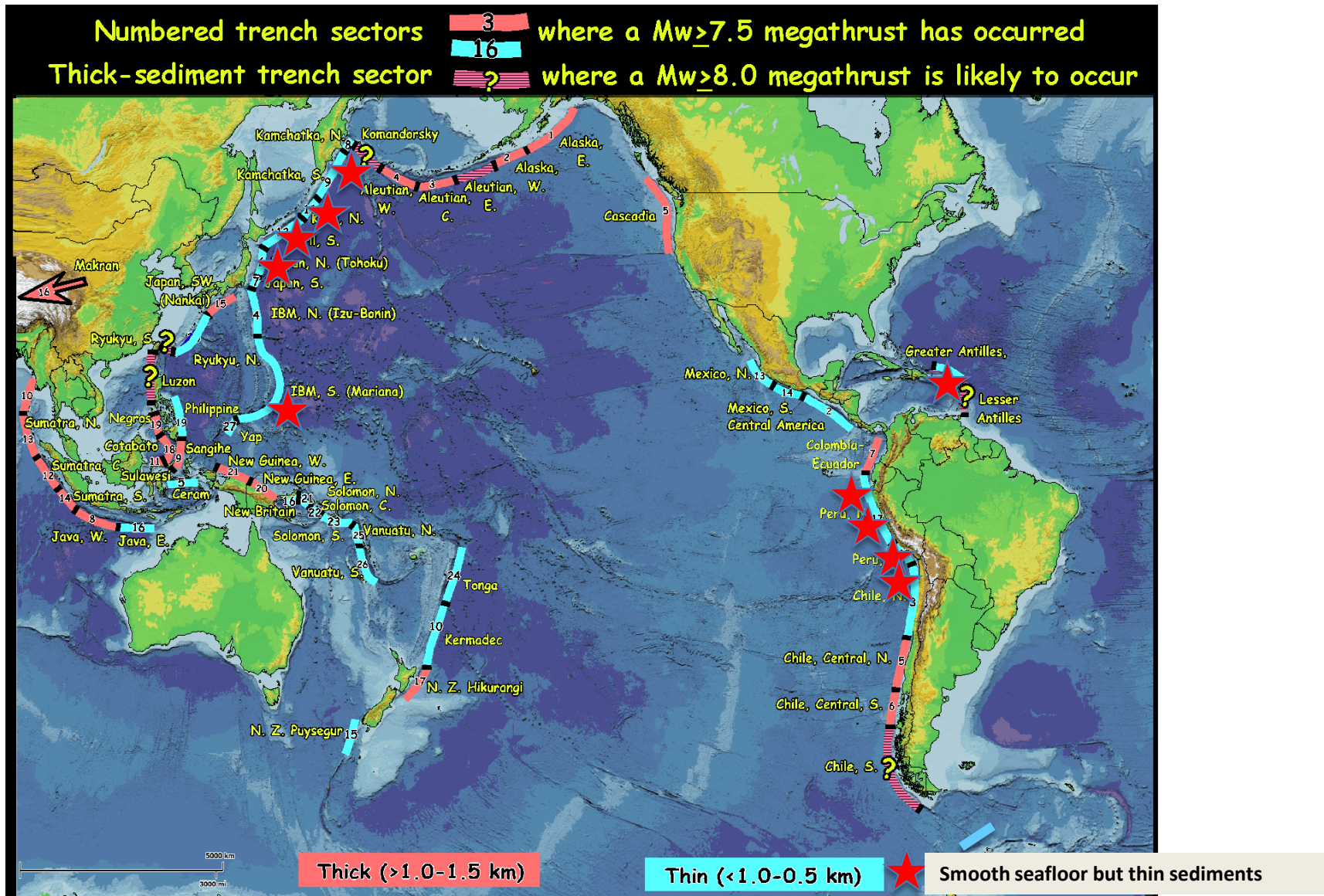
1946 tsunami, 12 m runup

4. Pilot paleotsunamic and seismic survey in Waipio Valley, Big Island, HI. 700 m of late Quaternary sedimentary record of Kirby, Goff, Chagraff-Goff, Fryer, Dudley, Catchings, Jaffe, ...

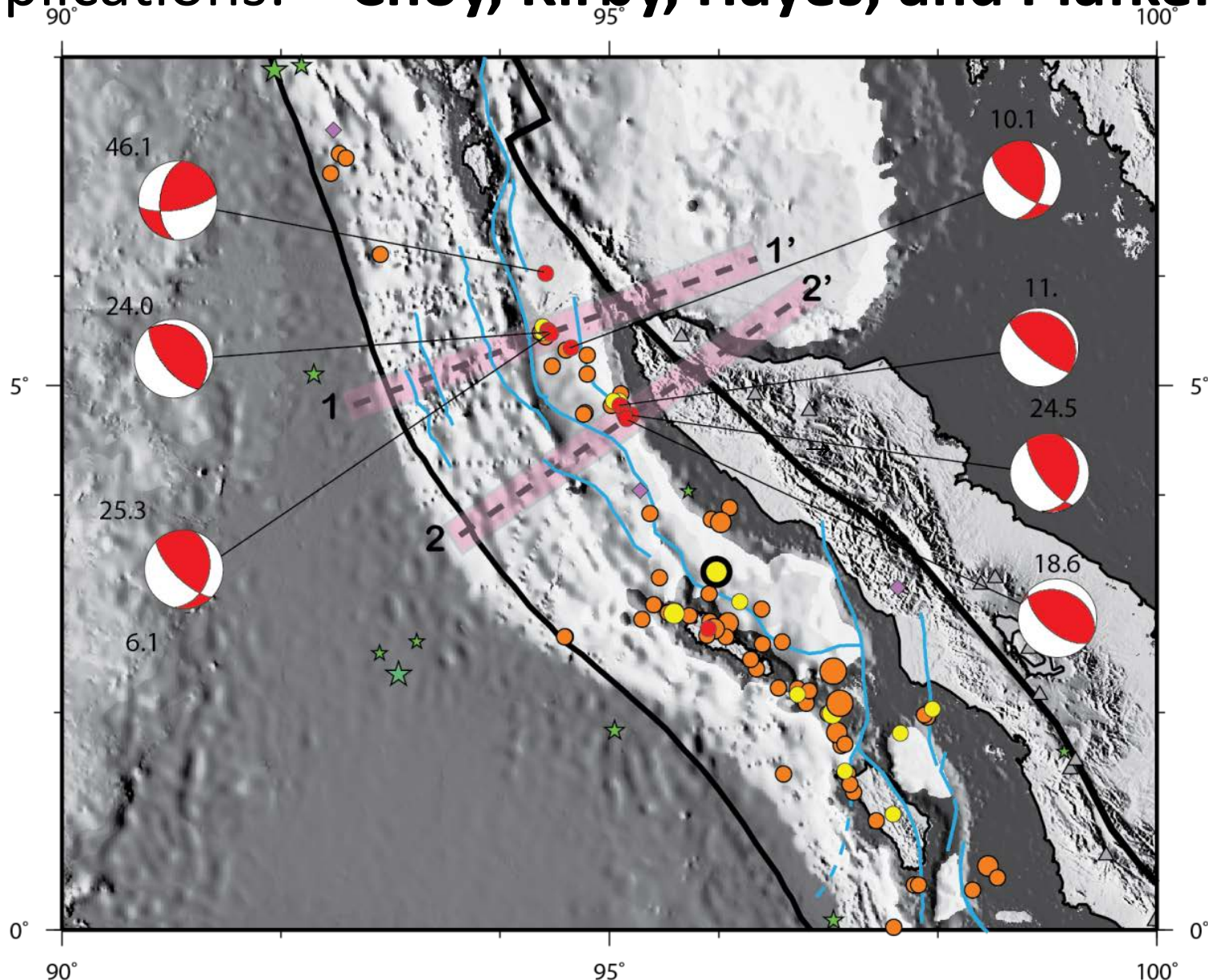


4. Global megathrust EQ tsunami hazard appraisal based on the instrumental and historical seismic record and marine geoscience. Trench sediment fill and seafloor smoothness.

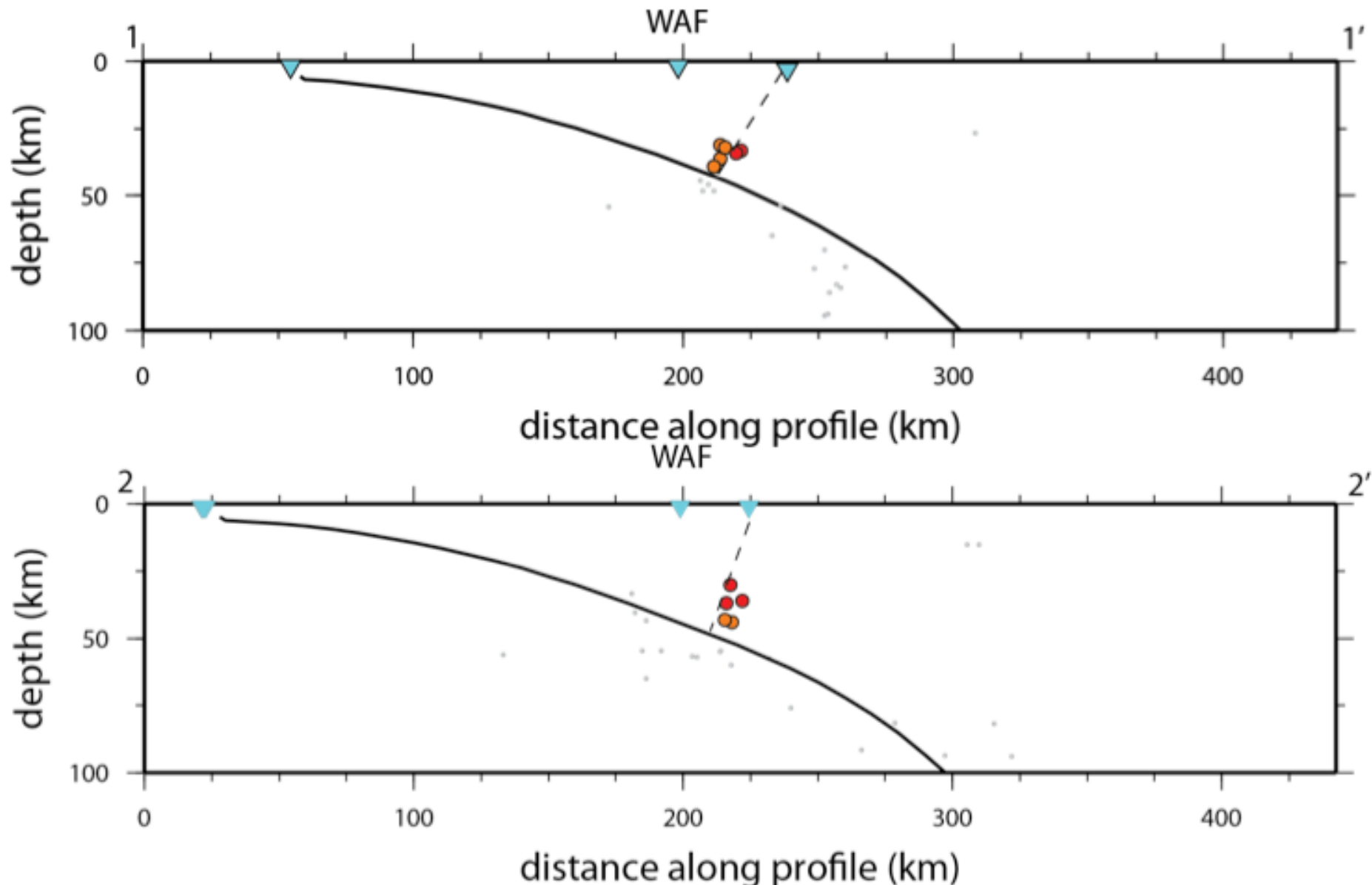
Scholl, Kirby, Wells, & Okal



5. Seismic source characterization for splay and popup EQ sources off Sumatra with global tsunami implications: **Choy, Kirby, Hayes, and Plafker.**

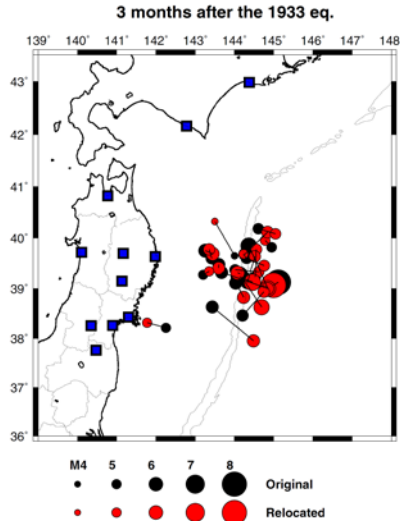


5. Seismic source characterization for splay and popup EQ sources off Sumatra with global tsunami implications: **Choy, Kirby, Hayes, and Plafker.**

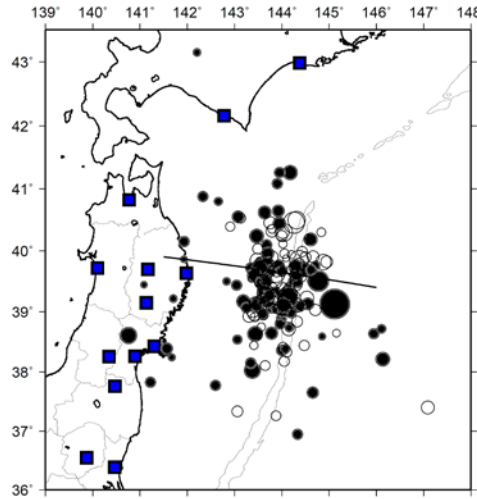


6. Great off-trench normal-faulting earthquakes and tsunamis: 1933 M8.6 tsunamigenic EQ Japan and elsewhere. Kirby, Okal, Uchida, Hino, and Wartman.

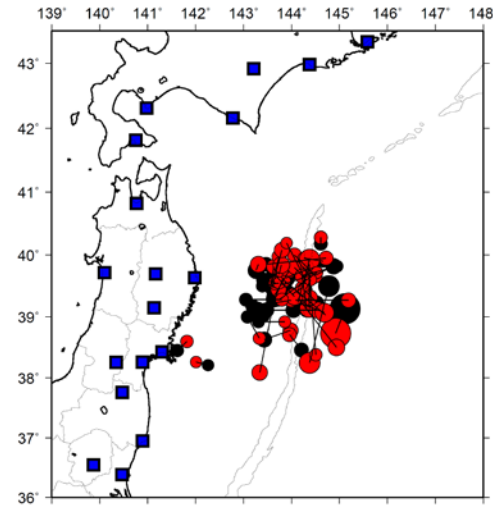
Local



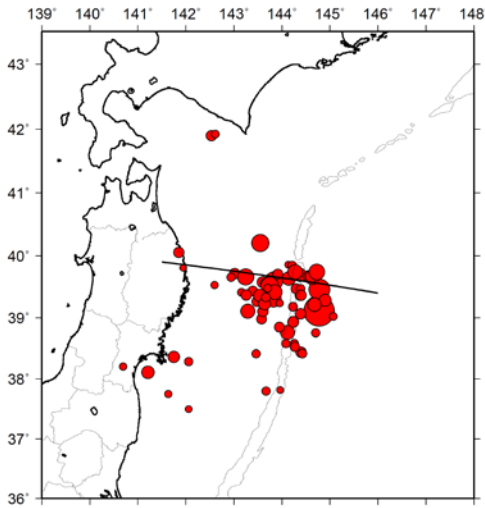
P-only



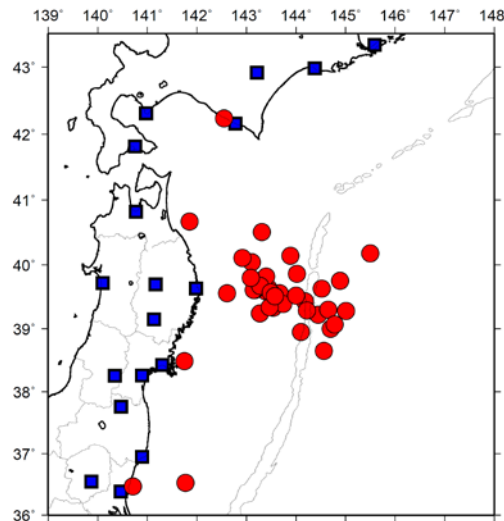
S-P



DD

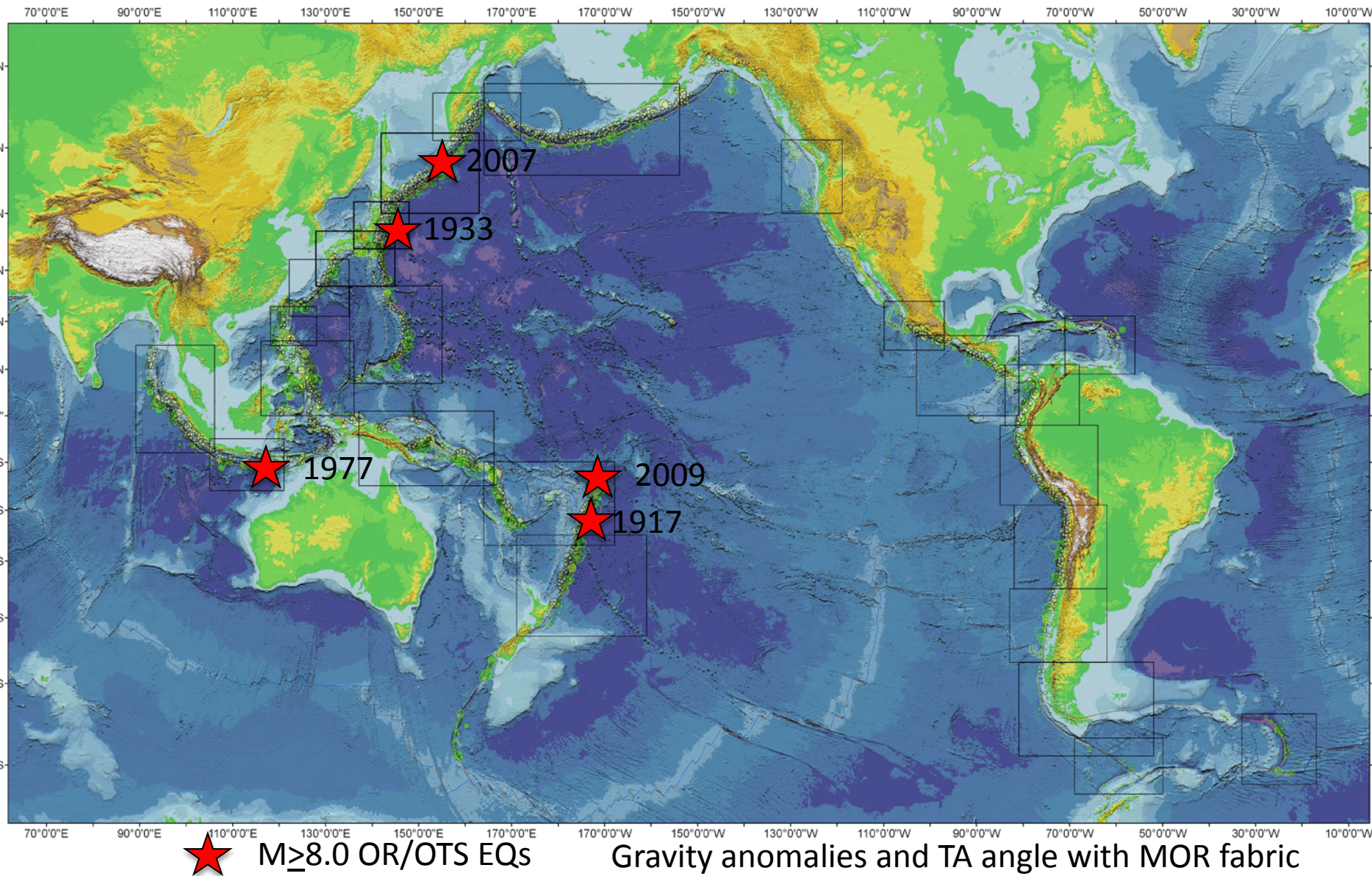


Global (Okal)

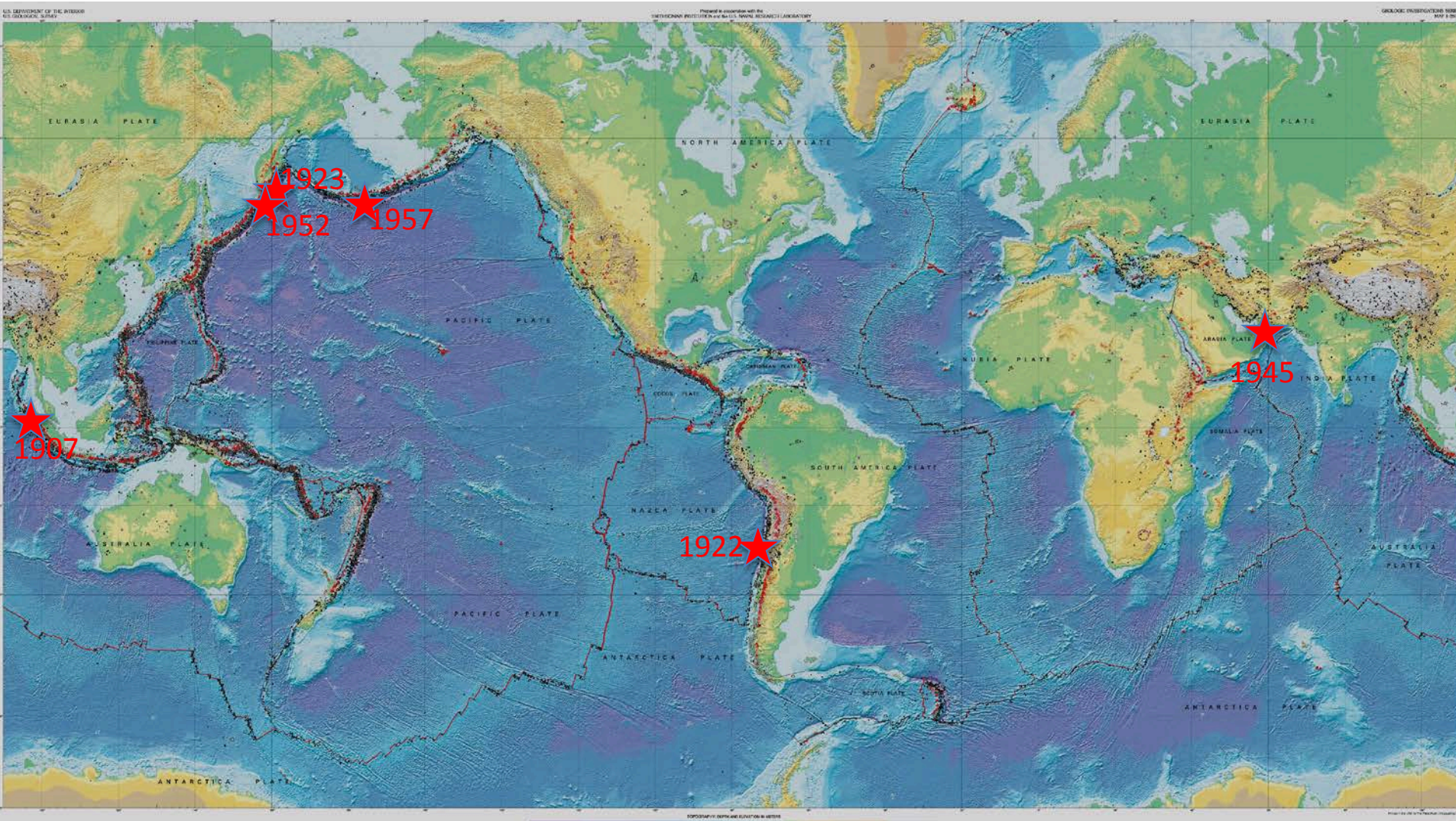


- Aftershocks both at outer rise and inner trench wall.
- Main shock hypocenter is located in the aftershock seismicity (little south from the aftershock centroid).
- The north-south extent of outer rise aftershock is about $L = 190 \text{ km} \times D = 40 \text{ km}$.
~Rupture source dimensions
- Mw 8.6, $s = 15 \text{ m}$
- **Source for near-field and far-field tsunami modeling**

6. Great off-trench normal-faulting earthquakes and tsunamis: 1933 M8.6 tsunamigenic EQ Japan and elsewhere. Kirby, Okal, Uchida, Hino, and Wartman.



7. Reappraisal of seismic moments of great tsunamigenic earthquakes predigital era (1907 Sumatra, 1922 Chile, 1923 Kamchatka, 1945 Makran, 1952 Kamchatka, & 1957 Aleutians). Tsunami models. **Okal, Kirby, Lee, and Kanamori**



U.S. States and Territories Affected

TSWG Activity	States Affected
1. SAFRR Tsunami Scenario	AK, CA, & HI
2. Reprocessing of Alaska legacy seismic lines and swath mapping	AK, CA, HI, & WP Territories
3. Exploratory paleotsunamic survey in Waipio and Waimanu Valleys, HI	HI, AK, WA, OR, CA, & U.S. Territories
4. Global tsunami hazard appraisal	Pacific rim states, PR & U.S. Territories
5. Splay and popup EQ sources off Sumatra and applications to U.S.	Pacific rim states, PR & WP U.S. Territories
6. Great off-trench normal-faulting earthquakes of western Pacific	AK, WA, OR, CA, HI, PR, & WP Territories
7. Reappraisal of seismic moments of giant tsunamigenic earthquakes.	Pacific Rim States, HI, & WP Territories

Tsunami Source Working Group: Members

1. Walter Mooney, Chair
2. Steve Kirby, Co-founder, Vice-Chair
3. Dave Scholl
4. Roland von Huene
5. George Plafker
6. Willie Lee, Co-founder
7. Holly Ryan
Scientist Emeritus
8. Eric Geist
9. Stephanie Ross
10. Ray Wells
11. Rick Blakely
12. Bruce Jaffe
13. Guy Gelfenbaum
14. George Choy

Ex Officio non-USGS members:

Emile Okal, Naoki Uchida,
Hiroo Kanamori, and Ryota
Hino.



Thank You!

Fishermen netting bodies of
tsunami victims, 1896 Sanriku,
Japan

廣田村の海中網を釣し十五餘人の死體を揚るる圖

Proposed Subfault Geometry and Slip Distribution: M9 Tohoku Emulation V3.0*: S. California Tsunami Scenario

