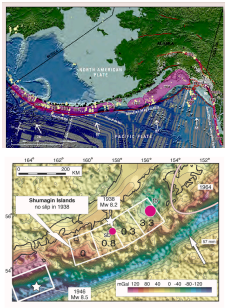
A good place to start in scientific targeting tsunami sources in Eastern Alaska: the 2013 Alaska earthquake scenario source for the SAFRR Tsunami Scenario.

USGS OFR 2013-1170. URL: http://pubs.usgs.gov/of/2013/1170/b/.

Stephen Kirby, David Scholl, Roland von Huene, and Ray Wells (All USGS, then in Menlo Park CA)

Summary: The USGS Tsunami Scenario Report published in 2013 is still a good place to start in targeting the Pacific Ocean margin of Alaska for tsunami sources that threaten U.S. shorelines. **This study is still useful because so few new field investigations have been completed in the decade since it was published. Important because of the detailed evidence presented and also the comprehensive tools that were cited and employed:**
Onshore: GPS models of IP slip accumulations, tsunami deposits, summary of the instrumental EQ record, *Critical* appraisal of Historical EQ's. *Offshore:* Summary of seafloor morphology and marine seismic structure, including re-processing of legacy digital data. Result: A putative Mw9.1 slip model for the Semidi Segment of the Alaska subduction zone is proposed.

Background



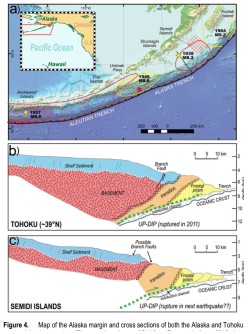
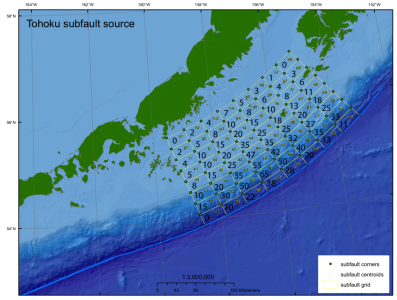


Figure 4. Map of the Alaska margin and cross sections of both the Alaska and Tohoku

*Disaggregation models show that tsunami sources from interplate sources offshore of the Alaska Peninsula and Fox Islands are most effective in raising waves in southern CA. Historical and instrumental evidence show that the Semidi sector is locked and has had little seismogenic slip in historical time. Seismic structure in this sector are similar to the Tohoku Sector in Japan where the Mw9.1 2011 earthquake showed high slip near the trench. We adapt such a slip model for the Semidi sector.

Tsunami Source Model



Model slip in meters for a Mw 9.1 earthquake in the Semidi sector.
*Tsunami Scenario Modeling Results: Tsunami waves and harbor water motions are expected to damage CA coastal towns and cause major disruptions in Southern CA commercial and Navy ports.

Post-Report Developments

*Likely submarine Landslide source confirmed for 42 m tsunami runsup on Unimak Is. (Von Huene et al., 2014, GRL)
*A series of 10 papers led by Donna Shillington resulting from a 2011 cruise of the RV Marcus Langseth and accessible as pdf files in *Google Scholar.*
*Tsunami deposit evidence of historic and prehistoric tsunamigenic earthquakes in Alaska on Umnak and Sedanka Is. (e.g., Witter et al., 2019, GSA Bull; Witter et al., 2022, Eos; Witter et al. 2014, Eos)).
*Lack of evidence for 1788 EQ coastal uplift or tsunami deposits supports our scepticism of significant slip in Semidi Sector (Witter et al., 2022, AGU Eos)
*Additional evidence of AK tsunami sources in Hawaii.
*Continued reprocessing of legacy seismic surveys of offshore AK by von Huene, Miller, et al. (von Huene et al., 2015, G3; von Huene et al., 2016. Pageoph ; von Huene et al. 2019, Geospheres).
*Large 2020 and 2021 Earthquake update and their aftership.

Continuing Recommendations: 1) Search for and dating of onshore tsunami deposits along the Pacific margin along the Alaska Peninsula and the Aleutian Islands; 2) Comprehensive multi-beam mapping and modern seismic structure of the Pacific marine margin of Alaska. 3) Drill core of trench and forearc basin fills in search of datable submarine slide deposits. 4) Continued reprocessing of legacy marine seismic and seafloor data. 5) Add a forecast of an aftershock sequence consistent with the scenario Semidi interplat slip model & an intraslab forecase [multihazard model.]