

## T11D-2643: 3D map of subduction zone geometry off the Alaska Peninsula

**Monday, 12 December 2016**

**08:00 - 12:20**

 *Moscone South - Poster Hall*

We present a 3D model of the interplate interface of the Alaska-Aleutian subduction zone between the Kodiak and Shumagin islands derived from multichannel seismic (MCS) reflection data acquired during the ALEUT cruise in 2011. Six trench-normal transects, and connecting trench-parallel profiles were used to construct an interface model covering ca. 130,000 km<sup>2</sup>. The model stretches across the fully coupled Kodiak Asperity into the strongly coupled Semidi-Segment. Both segments ruptured in great ( $M > 8$ ) megathrust earthquakes in the past century. The SW part of the model encompasses the Shumagin seismic gap that is believed to be weakly coupled. No megathrust events have occurred on this section for at least 150 years. Top and bottom bounds for the reflection signal from the subduction interface were picked starting from the trench at ~6 s TWTT to as deep as ~19 s TWTT (ca. 55 km) at the landward ends of the MCS profiles. The average of the two bounds is considered to be the location of the interface, while the top and bottom bounds provide the uncertainty for its location. This uncertainty increases with depth as the band of reflections thickens due to the broadening of the deformation zone likely due to localized underplating at the transition from stick-slip to stable sliding. A time to depth conversion was performed using sediment velocities and basement geometry from seismic reflection data and crustal/upper mantle velocities from first arrival tomography models based on data from two wide-angle refraction profiles crossing the center of Semidi-Segment and the Shumagin Gap, respectively. We calibrated the reflection imaging results by comparing the interpreted interface location with earthquake hypocenter distribution. The results show a trend of deepening of the subducting slab to the west. This 3D map of the subducting interface will be a helpful tool for further studies targeting this area of the Alaska-Aleutian subduction zone.

### Authors

Harold Kuehn

*Dalhousie University*

Mladen R Nedimovic \*

*Dalhousie University*

Donna J Shillington

*Columbia University of New York*

Anne Becel

*Lamont -Doherty Earth Observatory*

Jiyao Li

*Lamont Doherty Earth Observatory of Columbia University*

Spahr C Webb

*Lamont Doherty Earth Observ*

Keith E Loudon

*Dalhousie University*

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