

Southern Alaska Lithosphere and Mantle Observation Network (SALMON): Science objectives and deployment strategy

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EarthScope Annual Meeting, Stowe, Vermont, June 2015

The SALMON FlexArray seismic experiment in southern Alaska is a two-year deployment of 29 broadband stations in the Cook Inlet region. The science objective is to use local and teleseismic earthquakes to image the seismic structure of the crust and upper mantle in order to better understand the active tectonic setting and the tectonic history of the Cook Inlet region. One imaging target is the lower crust and uppermost mantle underlying Cook Inlet forearc basin. The magnetic high beneath Cook Inlet basin has been hypothesized to be either serpentinized mantle or accreted arc. A second imaging target is a subduction profile from Kenai Peninsula to Redoubt volcano and into the backarc region. SKS splitting measurements from the flat-slab subduction to the east show a strong deflection in fast direction; the anisotropic origin of this deflection is debated. Most of the stations are in roadless regions, so we will be using the most efficient (and economical) means of transportation, including lake boat, ocean boat, four-wheeler, float plane, and helicopter.

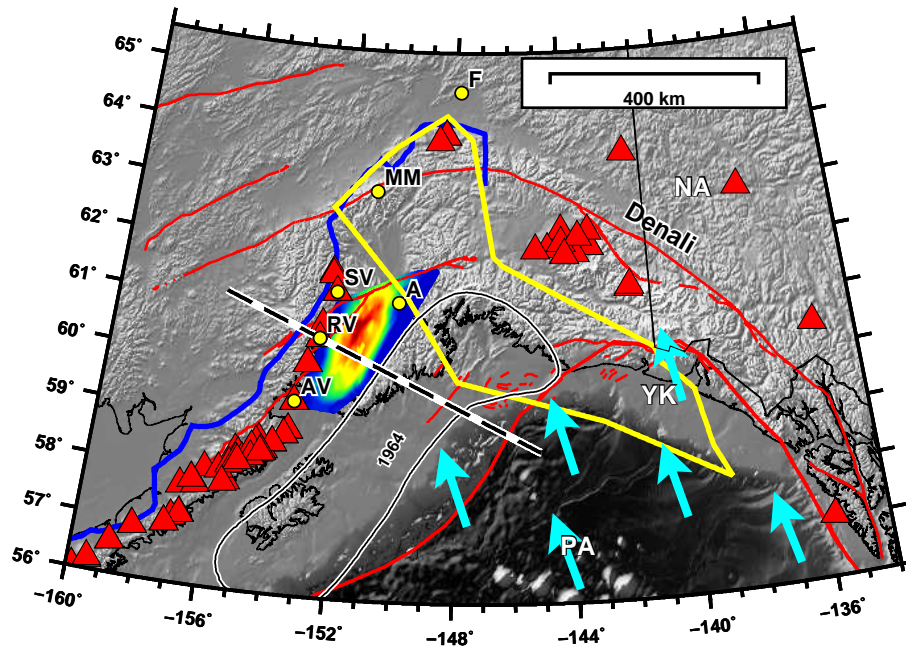


Figure 1: Active tectonic setting of south-central Alaska. The thick dashed line denotes the target 2D subduction profile for SALMON; the Cook Inlet region (slab, crust, basin) is the primary 3D target. Circles: AV = Augustine volcano, RV = Redoubt volcano, SV = Spurr volcano, A = Anchorage, MM = Mt. McKinley, F = Fairbanks. Colored image SW of Anchorage is the basement surface of Cook Inlet basin, with a maximal depth of 7.6 km (*Shellenbaum et al.*, 2010). Plate labels: NA = North America, PA = Pacific, YK = Yakutat block; arrows indicate PA motion relative to NA. Yellow outline denotes the (minimum) subsurface extent of Yakutat slab (*Eberhart-Phillips et al.*, 2006). Blue line marks the lateral extent of deep slab seismicity. Black outline marks the aftershock zone of the 1964 M_w 9.2 earthquake.