Using seismic methods to determine the crustal structure of the Aleutian Island Arc

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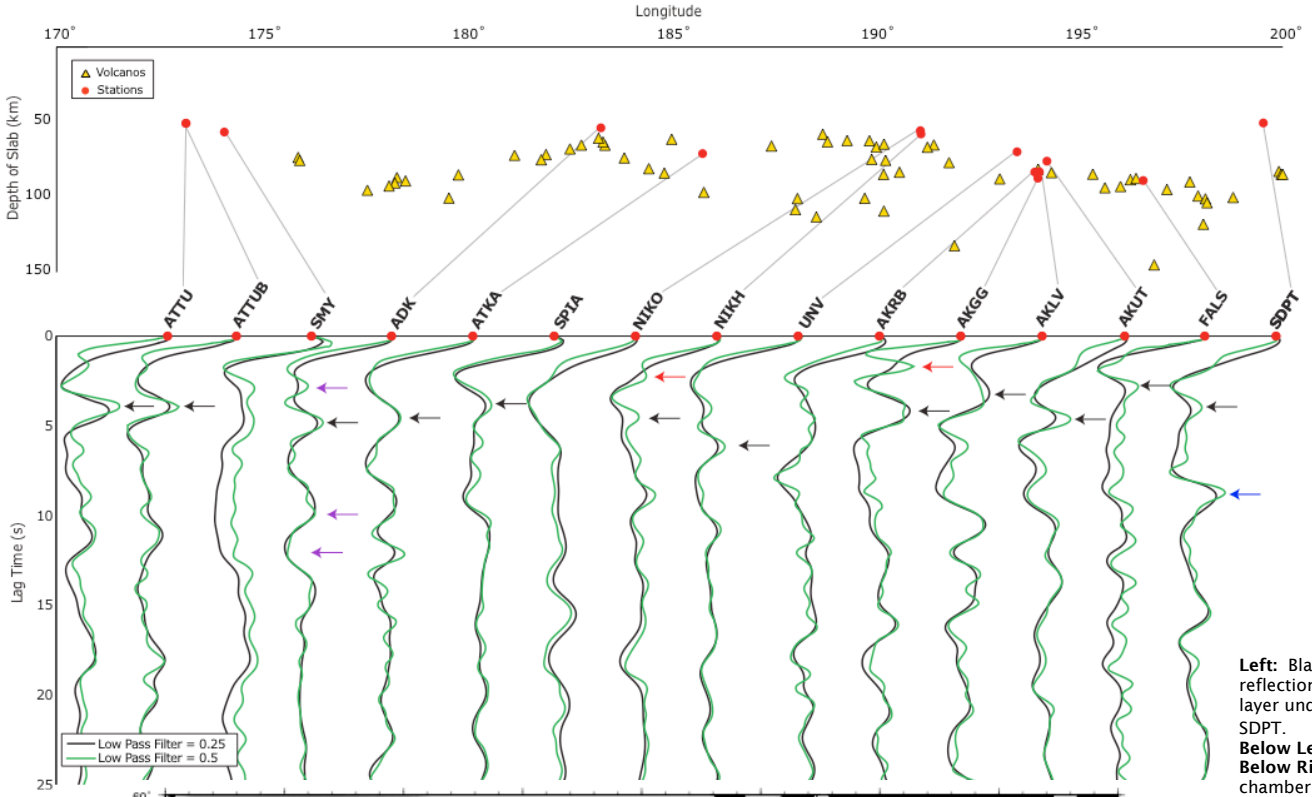

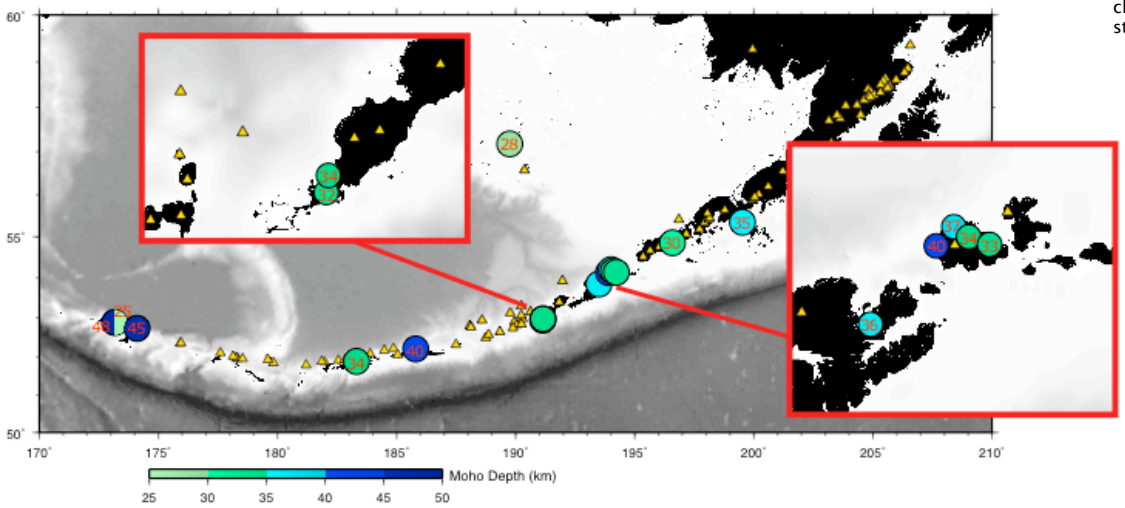

Why? To gain insight on the structure and composition of island arc crust, and better understand subduction zones and their role in formation of continental crust.

How? Using earthquake data, the method of receiver functions, and forward modeling.

Results: Determined reliable Moho depths for most stations. Saw shallower boundaries (possibly lower crustal) at ADK, and NIKH. Saw evidence of a magma chamber under AKGG, AKRB, and AKUT.

Could not constrain Vp/Vs well enough to determine composition - will need methodology that takes dipping layers and complex geometries into account.

Left: Black arrows indicate the first reflection for the Moho. Red arrows indicate the first reflection for a shallower interface. Purple arrows indicate all three reflections for another layer under ADK. The blue arrow indicates the first reflection off the subducting slab under SDPT.
Below Left: Map illustrating the depth of the Moho beneath each station.
Below Right: Map illustrating directions of propagation where evidence for the magma chamber was and was not seen. Seismic waves that passed under the volcano showed strong evidence compared to those that did not travel under it.