Broadband (Seismic) Experiment Across the Alaska Range (BEAAR)

Meyers, E.V., D. Christensen, and R. Hansen, *all* Geophysical Institute of Alaska, Fairbanks, AK, 99775.

In the Broadband (Seismic) Experiment Across the Alaska Range we will explore why mountain belts form over subduction zones. We will investigate the relative importance of crustal thickening by (a) horizontal compression and (b) uplift via dynamic mechanisms buoying up the lithosphere. PASSCAL instrumentation, which has 24 bit recording capability and superb programming flexibility, is being supplied through IRIS, Incorporated Research Institutions for Seismology. The experiment has three primary components: (1) a 300 km long line of broadband seismometers will be deployed across the Alaska Range, from Nenana to Talkeetna, consisting of seven instruments at 50 km spacing operating continuously for 24 months starting the summer of 1999, (2) approximately 30 instruments at 10 km spacing deployed for five months during the summer of 2000, eight of which will be positioned on a cross line, and (3) a four kilometer wide array positioned over the Bouguer gravity low to enhance resolution of this area, also deployed in 2000. This configuration allows us to examine the relationship between North America's highest mountain range and the continent's most active subduction zone, and will provide unequaled sampling of structural variations across the Denali fault, beneath the Alaska Range, and through the mantle wedge where the top of the subducted slab increases in depth from 50 to 150 km. Recording teleseismic and regional earthquake data will allow us to address the origin of subduction related orogenesis. Analysis efforts will focus on: (1) receiver function analysis to constrain the depth of the Moho and the subducting slab, (2) attenuation and travel time studies to provide data on crustal and upper mantle velocities (hence compositional and thermal variations), and (3) shear wave splitting to provide information on flow regime in the mantle wedge. Combined with gravity observations we may then evaluate isostatic compensation, inferring the forces that contribute to formation of mountains over subduction zones.