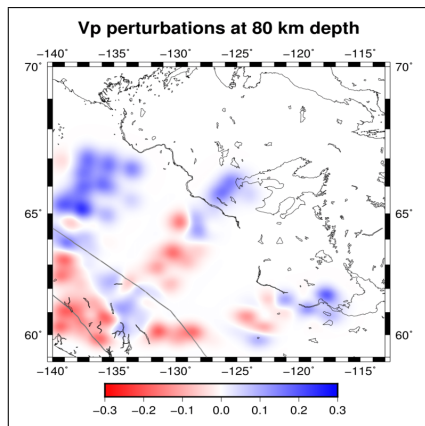


P-wave Tomography of the Mackenzie Mountains Region

Aditya U. Khare, Derek L. Schutt, Richard C. Aster,
Jeffrey T. Freymueller, Joel F. Cubley

The Mackenzie Mountains (MM) are an actively uplifting range in Yukon and the Northwest Territories, Canada, some 700 km from the plate margin, where mountain building stress is readily concentrated. Between the Mackenzies and the Coast Ranges, surprisingly little deformation is occurring. To investigate the causes of this deep inboard orogeny, the Mackenzie Mountain Earthscope Project has deployed 40 broadband seismometers in a linear array that extends from near the coast to the Slave Craton. We present initial tomography results from the first year of data collection. We used teleseismic P-wave tomogra-



phy to analyze velocity variations in this region. The data were collected from 37 Mackenzie Mountain stations, and an additional 63 seismic stations in the surrounding area. Using multi-channel cross correlation, events with a strong, consistent signal across the array were identified, and used to calculate relative arrival time residuals using the method of (Vandecar and Crosson [1990]). These residuals were inverted to calculate the velocity perturbations with respect to the AK135 global model. The results at uppermost mantle depths show a clear first-order transition west of the Yukon/NWT border from the slow velocity in the cordillera (red) to the high velocity in the craton, with additional complexities that suggest the lithosphere between the MM and the plate margin is heterogeneous.