Upper Mantle Structure Beneath the Whitmore Mountains, West Antarctic Rift System, and Marie Byrd Land from Body-Wave Tomography

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As part of the International Polar Year in Antarctica, 37 seismic stations have been installed across West Antarctica as part of the Polar Earth Observing Network (POLENET). 23 stations form a sparse backbone network of which 21 are co-located on rock sites with a network of continuously recording GPS stations. The remaining 14 stations, in conjunction with 5 backbone stations, form a seismic transect extending from the Ellsworth Mountains across the West Antarctic Rift System (WARS) and into Marie Byrd Land. Here we present preliminary P and S wave velocity models of the upper mantle from regional body wave tomography using P and S travel times from teleseismic events recorded by the seismic transect during the first year (2009-2010) of deployment. Preliminary P and S wave velocity models indicate that the upper mantle beneath the Whitmore Mountains are seismically faster than the resolved regions beneath the WARS and Marie Byrd Land. A significant slow velocity anomaly is observed beneath Marie Byrd Land centered on Mt. Sidley and slightly slow velocity anomalies near the mean of the model are pervasive beneath the WARS.