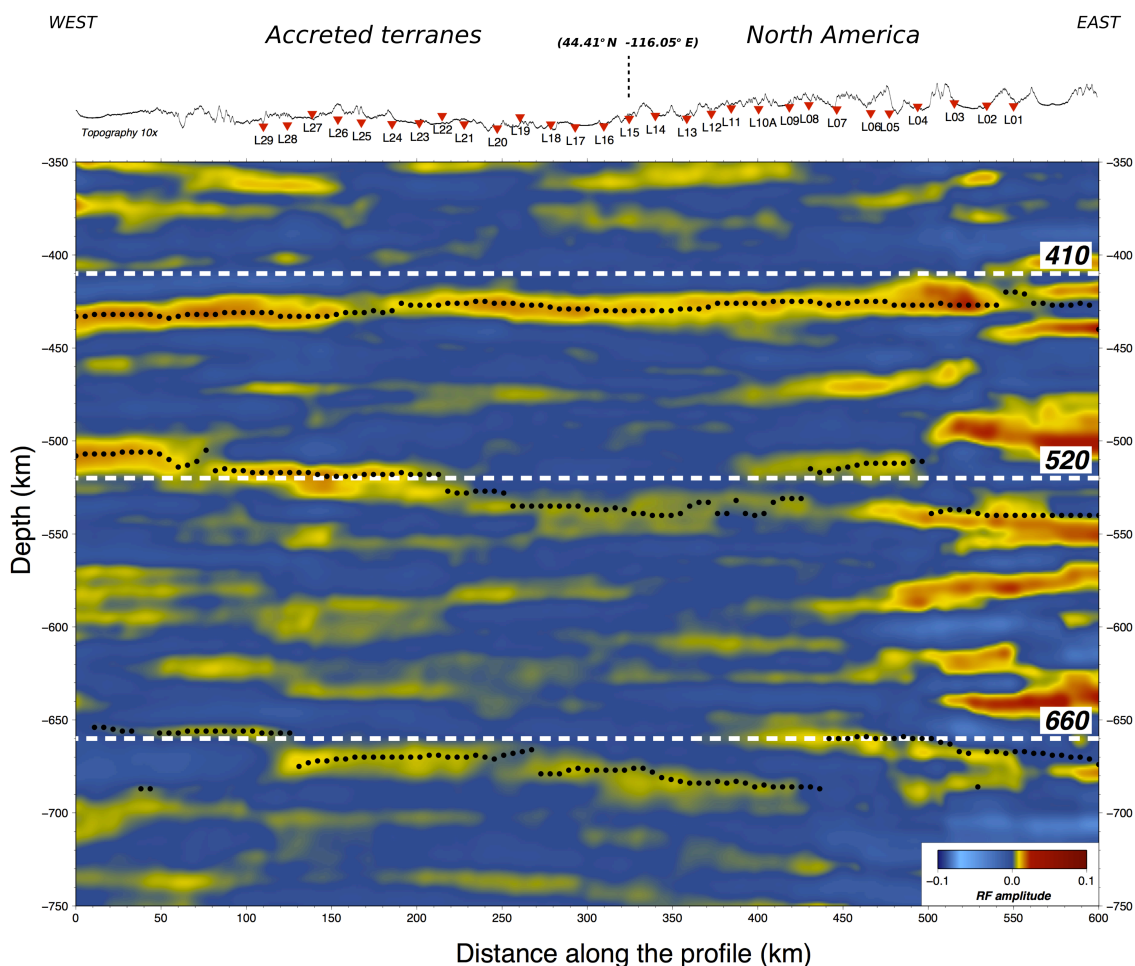


# Mantle transition zone structure beneath the northern Rocky Mountains in Idaho and Oregon from EarthScope IDOR receiver functions

A.C. Stanciu<sup>1</sup>, R.M. Russo<sup>1</sup>, V.I. Mocanu<sup>2</sup>, S. Hongsresawat<sup>1</sup>, P.M. Bremner<sup>1</sup>, M.E. Torpey<sup>1</sup>, J.C. VanDecar<sup>3</sup>  
<sup>1</sup>University of Florida, <sup>2</sup>University of Bucharest, <sup>3</sup>DTM Carnegie

We present new images of upper mantle structure beneath the northern Rocky Mountains in Idaho and Oregon constructed using Ps receiver functions from the EarthScope IDOR passive seismic experiment. Between 2011 and 2013 we deployed 85 broadband seismic stations at a variable spacing between 15 km and 35 km. This allowed us to have a good structural control over a region of approximately 500 km by 200 km. To image the upper mantle we used 180 teleseismic events with a magnitude higher than 5.9 recorded at epicentral distances between 30° and 95°. We calculated 85-second Ps receiver functions using time domain deconvolution. Next we back-projected and stacked all the receiver functions and constructed a common conversion point (CCP) volume that extends laterally outside the network coordinates and to a depth of 750 km. In these CCP images upper mantle structure seems to be dominated by a converting interface that is located ~15 km deeper than normal 410 discontinuity. This phase is characterized by a significantly higher amplitude than P520s, and an anomalously weak P660s phase. While the 410 discontinuity seems to be relatively flat and continuous across the entire profile, the 520 and 660 discontinuities show a distortion in the central region beneath the array. These areas correspond to an increase in the depths of these discontinuities.



(Top) Surface topography (10 x vertical exaggeration) at 44.41° N corresponding to the profile shown beneath. (Bottom) Common conversion point section

**Acknowledgments:** Katee Neesmith, Stephanie James, Kathy Davenport, Jon Delph, Katie Garman and Madeline Job helped with fieldwork. George Slad, Noel Barstow, and Prina Miller of IRIS PASSCAL provided field support. Elaine Alexander and colleagues at the U.S. Forest Service; David Wolff and Tim Vanek of the Bureau of Land Management helped permitting. We thank the people of Idaho and Oregon for permission to site on their properties. This work is supported by U.S. National Science Foundation Grant EAR-0844187.