

Preliminary Results from teleseismic P & S-wave delay times in the Superior Province Region using SPREE and TA data

Bollmann, T.¹, Van der Lee, S.¹, Frederiksen, A.², & the SPREE Team

The SPREE (Superior Province Rifting EarthScope Experiment) has been operating 83 stations around the Mid-Centroid Rift (MCR) for two years. This has given us the opportunity to pick a large number of teleseismic delay times that will give insight into the structure of the upper mantle beneath the study region.

We picked 25, 536 P-wave delay times from 131 teleseismic events and 11,930 S-wave delay times from 56 events using TA, SPREE and ANSS Backbone seismic stations. The events used were from distances of 35 to 92 degrees with magnitudes of 5.5 and greater. Due to these parameters, the majority of the events come from the NNW (Alaska-Japan) and the SSE (Central-South America). The average of these delay times was calculated for each station and is used as a proxy for crust and upper mantle structure beneath the station. An inversion of all delay times for event-specific delays and station-specific delays shows that the station-specific delays are very similar to the average station delay time. We subtracted the effects of topography from the delay times.

Although these delay times still contain shallow crustal signal, we will present results from an initial, preliminary tomographic inversion of the teleseismic P delay times.

We are very grateful for the critical contributions to SPREE from those landowners that allowed us to place the station on their land. In terms of outreach, we created multiple handouts for our landowners to keep them informed about the research being done and any breakthroughs being made with the data from the project. In the process of installing and servicing the SPREE stations, interviews about our project have been publicized on Canada1 Radio on the program Voyage North with Cathy Alex and several other news sources. SPREE was also featured in an EarthScope promotional video on Youtube (http://www.youtube.com/watch?v=JPtWu_WATXs&list=PLB3C4CB7F022DEF12).

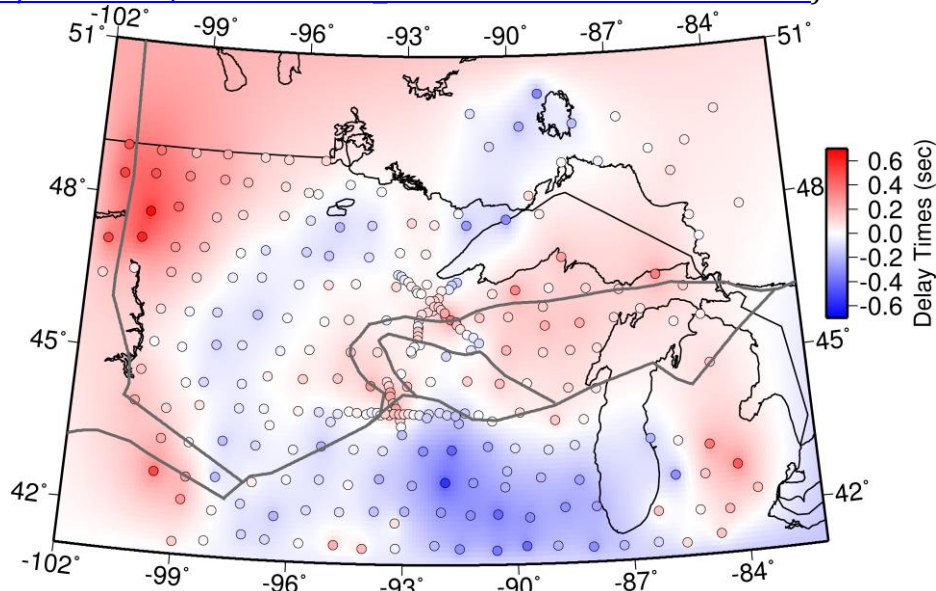


Figure 1 - Average P-wave delay times with no weighting and a surface fit to the points. The grey lines are the Whitmeyer & Karlstrom terrain boundaries

¹Northwestern University, 633 Clark Street, Evanston, IL 60201

²University of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2