Subtask 3: Quarterly Report

A preliminary 1D seismic velocity model was derived from ambient noise correlation as part of a previously funded project. It was based on continuous data from eight instruments deployed by LBL at the Brady site, just south of the natural laboratory. 28 Green's functions were obtained, then filtered between 4-10 Hz and a 1D model of Vp, Vs, and Qs estimated for each path. The preliminary model is a median of those individual models. Due to the geometry of the instrumentation, resolution is best for the top 1 km and poorly constrained with increasing depth. In the next quarter, we intend to develop a more highly resolved image of the Brady geothermal site, using data from additional sites that have since been deployed by LBL and are currently operating in the area. The original model can be found on the NGDS site at:

http://geothermaldata.org/dataset/brady-1d-seismic-velocity-model-ambient-noise-prelim-prelim-brady-median-vpvsqs-model-ambient-n

In Q1 of the PoroTomo project, we used this preliminary model along with some perturbations to calculate 3D synthetic seismograms for a hypothetical deployment at the Brady natural laboratory site. These synthetics are being used to design the network that will be deployed during the PoroTomo experiment. There are 5502 3-component records in each Brady calculation. These synthetic seismograms are scattered randomly along 3-planes within the computational domain to allow an evaluation of different deployment geometries. The perturbations to the reference model are included to assess the capability of the network to identify anomalies at depth.