

***From Death Valley to Lake Superior: Large igneous province
magmatism and the assembly of the supercontinent
Rodinia 1.1 billion years ago***

Dr. Nicholas Swanson-Hysell, University of California, Berkeley

If you have spent time in Death Valley, you have likely seen the bright white waste piles from talc deposits that formed through contact metamorphism when thick diabase sills were emplaced associated with a 1.1-billion-year-old large igneous province. This large igneous province spans from Death Valley to the Grand Canyon region and beyond. From precise new geochronology, we can constrain this mafic magmatism to have occurred contemporaneously with voluminous magmatism more than 2,000 kilometers away within a major intracontinental rift system that is preserved within the Lake Superior region. This widespread magmatism could have resulted from a large bifurcating upwelling mantle plume. Paleomagnetic data from these large igneous provinces provide a detailed record of the movement of ancient North America as it moved towards the collisional Grenvillian orogeny that resulted in the formation of the supercontinent Rodinia, whose tenure straddled the Mesoproterozoic to Neoproterozoic boundary 1.0 billion years ago.

Biography: Nick Swanson-Hysell is an Associate Professor of Earth and Planetary Science at UC Berkeley. His research integrates original field observations with laboratory data sets to place quantitative constraints on the long-term evolution of Earth. In conjunction with his research group, he is particularly focused on developing paleomagnetic data sets, often from stratigraphic sequences, in order to test hypotheses about the migrating positions of continents (paleogeography), changes to the surface environment (particularly planetary climate change), and the evolution of Earth's magnetic field.