

Relocating Earthquakes in the Socorro Seismic Anomaly, New Mexico

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The Socorro Seismic Anomaly is an area of elevated seismicity in central New Mexico responsible for 45% of magnitude >2.5 earthquakes in the state. This may be due to inflation of the Socorro Magma Body, an areally extensive body of magma residing at 19km depth. Improved source locations for earthquakes within the Socorro Seismic Anomaly have resulted from the addition of two broadband seismic stations to the existing network, and application of waveform cross-correlation (WCC) methods to improve picking consistency among events within earthquake clusters. The catalog of seismic data used for this project includes ~300 locatable events with magnitude greater than -0.9 in the area from September 1, 2004 to the present. The event locations are estimated using data from the permanent local, eleven-station seismic network and will include two temporary broadband seismic stations (PETR and SNKE) installed during Fall 2005 in the Sevilleta National Wildlife Refuge. Data from these new stations will lead to more accurate earthquake locations and aid in identification of additional events that may have been missed using only data from the permanent network. WCC allows comparison of seismic waveforms to eliminate inconsistencies in user-defined picks, thus reducing hypocentral scatter. The WCC process has been performed on multiple earthquake clusters within the Socorro Seismic Anomaly and, in many cases, reduces scatter and refines structures responsible for deformation.

Biographical Sketch

John Morton was born and raised in Newport News, VA. He attended the College of William & Mary in Williamsburg, VA and received his B.S. in Geology in 2004. He then worked in an Argon lab at the US Geological Survey in Denver, CO and then returned to Williamsburg to continue working with his undergrad advisor in 2005. He came to New Mexico Tech in the Fall of 2005 and is working on his M.S. in geophysics with Dr. Susan Bilek. His research focuses mainly on seismicity of the Socorro area. He hopes to be finished by August, 2007, after which he will try to find a seismology job outside of industry.