Spiess, Vivian, "The Effects of Varying Water Temperatures of Volcanically-Influenced Rivers and Hot Springs on Aquatic Macroinvertebrates: Volcán Arenal, Costa Rica." Adviser: Monika Springer. Colorado College. 2012. 49pp.

I analyzed macroinvertebrates that inhabit freshwater river systems of varying temperatures. My main objective was to relate the temperature of water to the biotic assemblage of several streams in the region of Volcán Arenal, Costa Rica. Four rivers were sampled for temperature and macroinvertebrate fauna during the months of April-May 2011, with one stream of varying temperatures due to the introduction of a hot spring about 30 m from the mouth of the stream. There was a significant difference in the abundance, richness, and biodiversity between each site, as well as a negative correlation between abundance, richness, and biodiversity with rising temperatures. Breathing adaptations showed a significant difference between sites of cooler and warmer water. Changes in climate could cause an increase in water temperature of streams, which in turn may have a negative effect on the biodiversity of river systems and the surrounding ecosystems.