

# Geochemistry of Rio Grande Rift Travertine Depositing Springs: Implications for Rio Grande Valley Water Quality

Dennis L. Newell and Dr. Laura J. Crossey (advisor)  
Department of Earth and Planetary Sciences, University of New Mexico

## PURPOSE OF STUDY

The quantity and quality of water within the Rio Grande Valley has emerged as a major problem in New Mexico. We must address the question of what controls the water quality in the Rio Grande and the groundwater. It is clear that humans have some impact, but the overall effect of the natural environment is not well known. Researchers have recently shown that the decrease in water quality of the Rio Grande as one moves downstream (the river becomes saltier) is not solely due to human impacts (agriculture), and that there must be a strong component of deep saline waters mixing with the freshwater system. We have termed these deep waters 'lower-world' waters. What is the impact of these lower-world waters on water quality? Along the Rio Grande rift, there are numerous springs that are depositing travertine, and these are often located along rift fault systems. We propose that these faults are tapping saline lower-world waters deep within the basins of the rift allowing them to flow to the surface. These waters provide a unique 'window' to the lower-world and by analyzing these waters we hope to assess their impact on water quality within the Rio Grande Valley. Water and gas samples from these springs will be collected and analyzed for overall water quality, major and trace element chemistry, and gas chemistry. Our goal is to quantify the impact of deep basin water mixing on the water quality of the Rio Grande Valley.

## RESULTS

The project is ongoing and will be completed by December 31, 2004.

Dennis Newell presented the results of his WRRI project to date at the International Geological Congress in Florence, Italy in August, 2004. The paper was entitled, *Tracing the origins of travertine-depositing springs of the Colorado Plateau region, USA* by Dennis L. Newell, Laura J. Crossey, Tobias P. Fischer, Zachary Sharp, Karl E. Karlstrom, and Cougar Burke.



*Dennis and Trish Newell sampling active gases in the Grand Canyon.*



*While in Italy, Dennis participated on a field trip examining the classic travertine quarries of ancient Rome. Pictured are Dennis and committee member Karl Karlstrom in Italy at an active CO<sub>2</sub> geyser (left) and at the quarries in Tivoli near Rome (above).*

