Geochemical Characterization of CO_2-Bearing Siliciclastic Reservoirs, SE Utah

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The increase of anthropogenic carbon in Earth's atmosphere due to rapid global industrialization has led to concerns about the impact human activity is having on the environment. Structural trapping of CO_2 in coal seams, depleted oil and gas fields, deep saline aquifers, and capillary traps are currently being investigated as potential subsurface targets for CO_2 sequestration. The ability to predict capture potential of a given reservoir requires knowledge of how CO_2-bearing fluids affect the sealing potential of faults.

The Colorado Plateau region of the western United States hosts a number of CO_2 reservoirs. The Little Grand Wash fault (LGWF) located within the Paradox basin, SE Utah, cuts the Green River anticline forming a number of stacked three-way anticlinal closures. Ancient travertine mounds line the Little Grand Wash fault in this area and document a long history of active CO_2 discharge. However, it is apparent that certain strands of the fault have remained sealed while others have not. A number of Permian through Triassic limestone and sandstone units may serve as reservoirs for CO_2 from the Farnham and Woodside Domes to the Little Grand Wash fault zone.

XRF, XRD, and stable isotope data have been obtained from samples at the Utah Core Repository along the assumed flow path from source to discharge point have been obtained. This data can be used to create geochemical models of analogous systems not accessible for direct observation. These models can then be used to assess the feasibility of the long-term underground storage of CO_2.