

Welcome to Earth Matters – field notes on the geology of New Mexico’s Enchanting Landscapes. Celebrating Earth Science Week, I’m Lewis Land.

Visitors to Carlsbad Caverns National Park quickly learn that the Big Room at the bottom of the cave is formed in the Capitan limestone. The Capitan Formation is a fossil reef that encircles the Delaware Basin, an inland sea that occupied most of southeastern New Mexico and west Texas 260 million years ago. The Capitan reef is beautifully exposed along the southeast flank of the Guadalupe Mountains, forming a prominent headland at El Capitan in west Texas on the road to El Paso. Fewer people are aware that the reef plunges beneath the surface a few miles northeast of White City, forming a limestone aquifer that provides fresh water for the city of Carlsbad. The reef extends east and south in the subsurface for hundreds of miles into west Texas, but still fewer people know that throughout its vast extent, most of the water in the Capitan Reef is too saline to drink. Only the residents of Carlsbad are positioned to exploit fresh water resources in the reef, because the city is only a few miles north of the aquifer recharge area in the Guadalupe Mountains. However, this saline water, apparently useless to human beings, is now regarded as a valuable resource. Both the potash mining and petroleum industries plan to pump brackish water from the Capitan Reef for processing of potash ore and secondary recovery in oil fields in the Permian Basin region. And very few people are aware that New Mexico has abundant resources of brackish water in other aquifers throughout the state, which may eventually become a supplemental source of water supply through desalination during periods of drought.

Celebrating Earth Science Week, I’m Lewis Land, hydrogeologist with the Bureau of Geology at New Mexico Tech.