

INTEGRATED ELECTROMAGNETIC GEOPHYSICAL STUDY FOR WATER RESOURCES IN GREAT SAND DUNES NATIONAL PARK, COLORADO

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In early December, 2016, the USGS, in collaboration with the National Parks Service, collected DC resistivity and frequency-domain EM data along Medano Creek in the Great Sand Dunes National Park (GSDNP), Colorado. These data profiles were collected to help understand the hydrogeology along Medano Creek and stretch multiple kilometers in length. Motivation for this survey stems from new groundwater regulations, that may affect how GSDNP manages water if the two water wells that provide water to the GSDNP facilities are pumping from the unconfined aquifer. Well 2 provides water to the campground. Little is known about static water level or yields, as records of the well construction and yields are unavailable. Well 1 supplies water to the visitor center and some staff facilities and has a static water level ~90 m below land surface and has consistently yields 18 gpm. Broadly speaking, a conceptual model of the geology along Medano creek consists of three main water bearing layers separated by aquatards. These are, top to bottom, 1) a perched aquifer, 2) an unconfined aquifer, and 3) a confined aquifer. It is believed that there is an aquitard that creates a perched aquifer under and around Medano Creek.

We have inverted these data and have begun jointly interpreting the resistivity models. Initial results show several conductive features that we are interpreting as aquatards. Several of these features correlate with a locally shallower water-table with noticeable increased vegetation at the surface.