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Water Resources of the Moab/Spanish Valley Area, Grand County, Utah

- A hydrologic assessment to provide information to effectively and wisely plan for future water-resources development, and to protect the area's natural resources and ecosystems.

Why is an investigation of the valley's water resources needed?

The water resources of the area around Moab, Utah and Spanish Valley are a vital part of the continued health of that community and the surrounding residential areas. A reliable and clean water supply must be assured in order for the area to continue to develop.

Water can be and is obtained from surface and ground-water sources in the valley. Surface water is derived from two principal streams that drain from the La Sal Mountains – Pack Creek and Mill Creek. Ground water is obtained from two principal aquifers – the unconsolidated sediments in Moab and Spanish Valleys and the Navajo Sandstone (principally) of the Glen Canyon aquifer system, which extends from the northeast edge of Spanish Valley up onto the western flanks of the La Sal Mountains

There are numerous competing uses for and interests in the area's water resources including public supply and agriculture. The Matheson Wetlands lie adjacent to the Colorado River at the terminal end of the ground-water and surface-water systems that sustain the Spanish Valley area. The health of this ecosystem depends on the quality and quantity of the surface and subsurface water that moves through this area and ultimately discharges to the Colorado River. Mill Creek and the unnamed creek flowing down Negro Bill Canyon are principal drains for the Glen Canyon aquifer. These streams harbor verdant riparian and aquatic ecosystems that are sustained by the year-round influxes of ground water.

Growth and development projected over the next few decades will require some additional portion of the available water resource. Potential constraints to increases in local water use include the quality of available water and the effect of increased use on the hydrologic system and the natural resources it supports. **An improved understanding of water availability and the effects of increased water use are needed as managers try to answer key resource questions including**

(1) What is the safe yield of water from the valley's aquifer system,

(2) What effects will increased use have on the occurrence and movement of poor-quality water in the lower part of Spanish Valley and below the Atlas tailings,

(3) What effects will increased water-use have on the quality and supply of ground-water in Matheson Wetlands and thus the health of that natural resource, and

(4) What are the best water and land use approaches to protect the valley's water resources and minimize the impacts of future water development and climate variation?

Spanish Valley

What do we expect to gain from the study?

The study will provide the necessary hydrologic information to effectively and wisely plan for future water-resources development of the area. Specifically, the study will:

(1) Improve estimates of recharge and all other ground-water-budget components for both the alluvial and Glen Canyon aquifers,

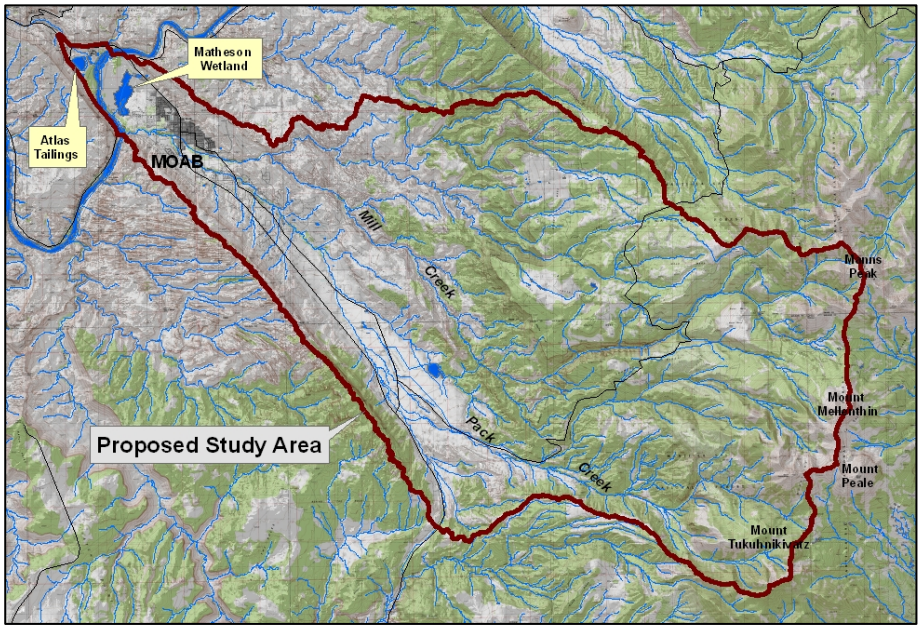
(2) Produce a conceptual model of the ground-water flow system and the relationships between surface- and ground-water resources.

(3) Produce a computer simulation tool that will allow for the quantification of (i) the relation between the area's surface- and ground-water resources, (ii) the interaction between various uses of ground and surface water including water use by natural systems such as the Matheson Wetlands, (iii) recharge zones for existing and proposed wells, and (iv) the effects of various management practices on ground-water quality and storage.

What methods will be used to complete study objectives?

The approach to achieving study objectives will include

- Establishment and operation of hydrologic data-collection networks – These would include meteorology data, surface water discharge and quality, ground-water storage (level) and quality,
- Conducting field studies to define poorly-understood features of the geohydrologic framework and the hydrologic budget. These tasks would include integration of existing geologic data with new field observations such as surface fracture characteristics of the Glenn Canyon aquifer system and the application of surface geophysical techniques to improve definition of aquifer structure and volume,
- Conceptualizing and quantifying recharge, ground-water flow paths and discharge, including use of geochemical tracers (environmental isotopes, age-dating techniques) and GIS-based recharge maps.



- Representing, testing, and verifying these conceptual models numerically using computer simulation tools,
- Utilizing the ground-water flow model to evaluate the potential effects of alternative future water development scenarios on water quality and water availability. This task would include the application of new USGS Ground Water Management tools for evaluating "best" future water-management strategies via optimizing locations of future well fields and artificial recharge sites.
- Instructing local management agencies on the use of study products to help with community and county planning for the future.

The above tasks will involve interdisciplinary investigation and close cooperation between numerous groups who have knowledge or available data for the study area. Personnel needs will be varied and met principally, but not exclusively, through the U.S. Geological Survey (USGS), the Utah Department of Natural Resources, and through cooperating local Universities. Staff will be needed from USGS Utah Water Science Center (UWSC). Various support groups from the UWSC will be used for GIS and other data base support, and project management needs. The UWSC Moab Field Office can provide field support for established observation networks in the valley. The study is proposed to begin in the fall of 2008 and be completed in the fall of 2011.

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