Geological Society of America Topical Session to be held during the 2005 GSA Annual Meeting, 16-19 October 2005, Salt Lake City, Utah

The hydrosystem of the Great Salt Lake Basin: new frontiers for observing and modeling human-impacted hydrologic, climatic, and geomorphologic processes

You are encouraged to contribute a presentation to this session. Abstracts should be submitted by July 12, 2005 via the GSA website http://www.geosociety.org/meetings/2005/.

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Short Description: Observations and modeling of climatic, hydrologic, and geomorphologic processes impacted by human activity in the rapidly urbanizing Great Salt Lake Basin provides insight, and serves as a microcosm, for understanding hydrosystems of the modern West.

Full Description: The Great Salt Lake (GSL) hydrologic basin encompasses 58,000 km2 where snowmelt-driven recharge in the mountains supplies water to the arid valleys. It spans 3 geologic provinces, contains almost every known rock type, incorporates a vast array of modern geomorphic processes and deposits, and has a wide range of land uses (from alpine wilderness to intensive agriculture) in a rapidly urbanizing region where a water shortfall of 800,000 acre-ft per year is predicted by 2050. Typical of much of the Western U.S., human impacts through land use changes and engineered water systems have considerably altered the hydrology and geomorphology. This complex nonlinear system includes bedrock and basin-fill groundwater movement, geothermal systems, fluvial processes, lacustrine environments, and extensive anthropogenic manipulation of the hydrology through dams, canals and diversions for irrigation and urban use. Environmental issues range from nonpoint source contamination to mining-related or military-induced pollution. The basin contains low-level nuclear and chemical waste repositories and may become a 'temporary' repository for high-level nuclear waste. Important societal concerns center on: How do climate variability and human-induced landscape changes affect hydrologic processes, water quality and availability, aquatic ecosystems and wetlands habitats over a wide range of time and length scales? What are the resource, social and economic consequences of these changes? How has this system evolved and what does the future hold? What are potential solutions for serving the future needs of the growing population, accommodating myriad land-use demands, and remediating contaminated water? How should rivers be restored or rehabilitated while accommodating extensive use and irreversible watershed changes? How might communities on the GSL coexist with climate-controlled lake levels yielding dust storms during low stands or flooding at high stands? Few hydrologic models can represent the integrated processes of this mountain-to-desert system. Thus, observations across a range of length and time scales are critical for advancing our understanding of interactions between human activity, hydrology and geomorphic processes. Contributions are solicited from a wide range of workers examining the hydrology, paleoclimate, ecology and geology of the Great Salt Lake Basin region and who use observations and models to address fundamental and practical questions