

# UTAH'S GREAT SALT LAKE: A COMPLEX ENVIRONMENTAL–SOCIETAL SYSTEM\*

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**ABSTRACT.** The Great Salt Lake in Utah is a highly complex system, consisting of physical and chemical lake properties and environmental and societal subsystems. Components of these subsystems interact in many nonintuitive ways, with the result that changes and management decisions in one part of the lake system can produce unexpected changes elsewhere. The management history of the lake does not show serious consideration of these interconnections, although recent efforts suggest that this may be changing. Legislative and financial support will be required if integrated management of this unique resource is to succeed.

*Keywords:* Great Salt Lake, lake management, systems approach, Utah.

The Great Salt Lake is one of the state of Utah's most recognizable features. This recognizability stems in part from its incongruity as a natural feature—a lake in the (semi)desert—and in part from its central role in environment-society relationships in this part of the U.S. West. From early Native American uses of the lake and its surrounding wetlands for hunting and forage (D. B. Madsen 1980; Simms and Stuart 2002), through its role as an obstacle to the construction of the transcontinental railroad in the 1860s, it has historically been a focus for human interaction with, and exploitation of, the natural environment. This tradition continues today, and it has arguably grown more complex as human uses of the lake have expanded to include not just hunting and transportation but also chemical extraction, recreation, waste disposal, and the harvesting of brine shrimp. The Great Salt Lake can now be seen as lying at the heart of an environmental-societal system of great complexity that connects many seemingly disparate uses and users through the various physical and chemical properties of the lake. Using a systems approach, this article aims to identify some of the key components of this environmental-societal system and to explain some of the processes that link these components .

## EVOLUTION OF A COMPLEX SYSTEM

The Great Salt Lake is a terminal lake—that is, one with no outflow—characterized by a high level of salinity. It is a remnant of pluvial Lake Bonneville, a much larger, freshwater lake formed during a period of wetter conditions in the western United States around 25,000 B.P. The drying climate has left the present-day Great Salt Lake as essentially a giant puddle occupying a depression in the Salt Lake Valley just to the west of the Wasatch Mountains. In many respects the Great Salt Lake marks the eastern edge of the desert country of the Great Basin; harsh desert conditions pre-

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\* Many thanks to Ryan Orrock for inviting me to join him on a flight over the Great Salt Lake in December 2003, which allowed me to take many of the aerial photographs that illustrate this article. This manuscript was greatly improved by the comments of Carla Trentelman, the anonymous reviewers, and the editors of the *Geographical Review*.

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