

# Natural Resources and Environmental Issues

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Volume 14 *Bear Lake Basin*

Article 8

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2007

## Geologic history of the Bear Lake basin

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### Recommended Citation

Palacios, Patsy; Luecke, Chris; and Robinson, Justin (2007) "Geologic history of the Bear Lake basin," *Natural Resources and Environmental Issues*: Vol. 14 , Article 8.

Available at: <https://digitalcommons.usu.edu/nrei/vol14/iss1/8>

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## **GEOLOGIC HISTORY**

For roughly 500 million years, during much of the Paleozoic and Mesozoic periods, the Bear Lake Basin was inundated by an inland sea. This sea would retreat and then advance leaving limestone and sandstone deposits scattered around the valley. This abruptly changed during the Laramide Revolution some 70 million years ago when the land experienced violent earthquakes that buckled the surface and forced the sea bottom upwards to 20,000 feet. Sea bottom limestone was now in direct contact to quartzite layers that had been formed millions of years earlier (Parson, 1996). This period created the present-day landscape with evidence of the over thrusting evident along the cliffs surrounding the basin and these forces continue to shape the land even today. Bear Lake was formed 150,000 years ago and extended as far north as Pescadero, Idaho. Most of the lake was shallow with deeper water impounded at the southern end of the valley. Although prehistoric Lake Bonneville covered much of Utah during this period, it never actually connected to Bear Lake but evidence suggests it was as near as 30 miles to the west. During this time the outflow from Bear Lake feed into Lake Bonneville. Concentric bars found at Ideal Beach and Garden City suggest the shoreline of the lake reached an elevation near 5948 feet before dropping to the current elevation of 5924 feet (Williams, 1962). Faulting along the east and west shores during the

Lifton episode approximately 8,000 years ago resulted in the lake occupying its present position and configuration. Figure 6 shows lake bathymetry.

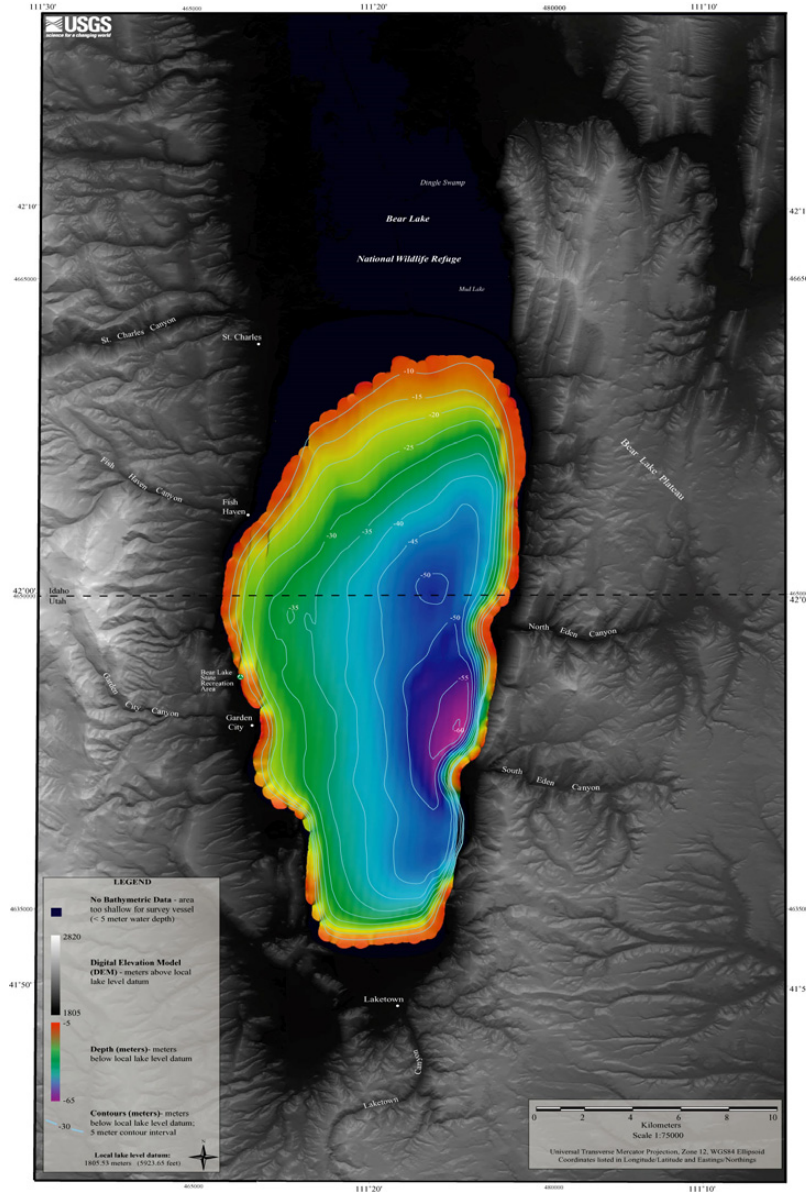


Figure 6. Bear Lake Bathymetry. Depth is more shallow in the outer orange region with deepest area denoted in pink area near the east shore (USGS <http://pubs.usgs.gov/of/2003/of03-150/html/FIG7.HTM>, 2003).

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The Bear Lake Basin is composed of a wide range of geological formations from unconsolidated lacustrine, deltaic and alluvial deposits to consolidated limestone, dolomite, quartzite and sandstone deposits. Unconsolidated deposits are generally located in the valley floor with the consolidated deposits situated at elevations above 6,000 feet (Kaliser, 1972).