



The Great Salt Lake

October 31, 2024

The Great Salt Lake is a substantial part of Utah’s culture, economy, and ecosystem. That said, it was among the least important of 17 items prioritized by Utah voters in early 2024. It is not clear if its low priority is because the Great Salt Lake is seen as a regional issue, or if the issue was considered resolved after the critically low water levels in 2022 were – at least temporarily – abated. **Human water use comprises 67% or more of the Great Salt Lake’s low elevation.¹ Low water levels cause economic, ecological, and air quality problems.**

Great Salt Lake Concerns

The Great Salt Lake’s dangerously low water levels in recent years are primarily attributed to humans diverting an unsustainable amount of water from the lake, thereby harming the long-term future of the lake.² The lake is estimated to be 11 feet lower than it would otherwise be without human diversions.³ Low water levels are also destroying the habitats around the lake, increasing water salinity, and exposing toxic dust materials into the air. This in turn, hinders Utah’s brine shrimp, mineral extraction, and ski industries.

When thinking about the Great Salt Lake, conservatives tended to be most concerned about economic issues, while liberals were most concerned about air quality and ecological issues. Moderates prioritized air quality above other concerns. (See Figure 1.)

Economic Effects

The decline of the Great Salt Lake most directly affects the brine shrimp and mineral extraction industries. Agricultural and recreational industries would also be affected. The lake’s annual economic value is estimated at \$1.9 billion. It supports over 7,700 jobs totaling \$375 million in income.⁴

The brine shrimp industry provides nearly 50% of the world’s brine shrimp eggs.⁵ The industry then provides the food source for the production of over 20 million pounds of farmed seafood, feeding millions

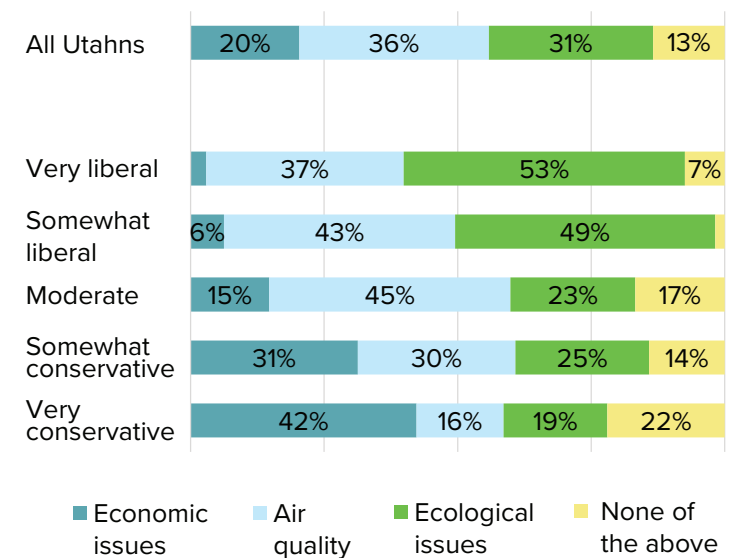
of people. Low water levels increase the saltiness of the lake and severely limit the productivity of the brine shrimp industry.⁶

Low water levels also make it more difficult for the mineral extraction industry.⁷

A declining Great Salt Lake also affects recreational activities. Activities like hunting and hiking might benefit from improved access, but low lake levels

When thinking of the Great Salt Lake, liberals prioritize ecological issues, moderates prioritized air quality, and conservatives prioritized economics.

Figure 1: When Thinking about the Great Salt Lake Water Level, What is Your Top Priority?



Source: Utah Foundation Survey.

limit boating and birdwatching.⁸ The greatest effect of the Great Salt Lake on Utah's recreational industry, however, is the ski industry.

Importantly, the lake contributes 5-10% to Utah's snow levels and is also able to extend the snow season by six weeks on average.⁹ Moreover, dust kicked up by wind from the exposed lakebed can result in a faster snow melt.¹⁰ Lower lake levels lead to less snow and a shorter ski season.

Ecological Effects

With a lack of freshwater input to the lake, the Great Salt Lake's salt levels have caused salt concentrations to increase beyond the tolerance of even salt-preferring creatures like brine shrimp and brine flies.¹¹ Brine shrimp and flies are a key part of the food web in the Great Salt Lake ecosystem. If damaged severely, this could destabilize the entire ecosystem of the area. This would have dire consequences for over 300 species of birds from the migratory populations that visit the lake every year.¹²

Air Quality Effects

When inhaled, particulate matter can damage lungs and can also enter the bloodstream, leading

to health conditions such as asthma and chronic obstructive pulmonary disease, heart and lung disease, birth defects, and cancer.¹³ Lower water levels in the Great Salt Lake expose more particulate matter to be carried by the wind.¹⁴ Roughly speaking, one foot of water decreases the number of dust "hot spots" (areas where particulate matter is most available to the wind) by 10%.¹⁵

There is additional concern from the toxic chemicals in the lake bed that may also have the potential to be an air quality problem.¹⁶ While most of the toxic chemicals have been identified and mapped in the Great Salt Lake, it is unclear how much of these chemicals are carried by the wind and effect human health.¹⁷ Low water levels could also increase nearby residents to airborne cyanobacteria and their cyanotoxins contained in dust.¹⁸

The lake's location causes the air quality problem to be accelerated. Because of the characteristic bowl shape of the Wasatch Front, air pollution can get trapped in the valleys. This effect is worsened in the winter where a cap of warm air in the cold valleys traps emissions and damages air quality even more.¹⁹

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This research brief was written by Research Intern Krishnam Goel with assistance from other Utah Foundation staff.

Endnotes

1. "The Strike Team estimates human water use comprises 67-73%, natural variability 15-23%, and climate warming 8-11% of Great Salt Lake's low elevation." See: Utah State University, "Great Salt Lake Policy Assessment: A synthesized resource document for the 2023 General Legislative Session," 2023, <https://d36oiwf74r1rap.cloudfront.net/wp-content/uploads/GSL-Assessment-Feb2023.pdf>.
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