

Great Salt Lake Advisory Council (GSLAC or Council) -- Supported Projects

Title and Summary	Year Completed	Contractor
1 - Economic Significance of the Great Salt Lake to the State of Utah	2012	Bioeconomics
<p><i>This report accurately details the economic significance of Great Salt Lake and its ecosystem to the economy of the state of Utah. Its annual economic output is \$1.32 billion with \$375 million labor income and 7,706 jobs. These significant economic benefits derive from: mineral extraction, processing and production; aquaculture (brine shrimp harvesting and processing); recreation (waterfowl hunting, bird watching); waste assimilation; industrial and other uses.</i></p>		
2 - Definition and Assessment of Great Salt Lake Health	2012	SWCA
<p><i>The report includes a definition of Great Salt Lake health, an assessment of current health, and an identification of critical future stresses to the lake. Some ecological targets could not be assessed due to insufficient data. The report concludes that although the lake's current health is relatively good, stresses are looming, which would degrade its conditions, including reduced lake levels that could cause myriad impacts on the ecosystem. The ecological health assessment of the lake is intended to advise government officials on the sustainable use, protection and development of Great Salt Lake.</i></p>		
3 - Great Salt Lake Research Priorities	2012	SWCA
<p><i>The Council prepared a Research Database to identify and prioritize important research topics related to Great Salt Lake. Research needs related to the lake far exceeded available research dollars. Consequently, the Council determined it would be useful to compile a list of research topics, then prioritize those topics (as high, medium, or low priority), in an attempt to direct limited research resources to the highest priority research needs. Lake experts were surveyed and collaboratively prioritized the research projects that were most needed for the lake. Research focus areas included lake and wetland health, water quantity and water quality. (Many of the priority topics have since been addressed.)</i></p>		

4 - Phragmites Control	2015	Various
<i>This project was designed to quantify the water requirements of the pervasive and invasive weed, Phragmite australis, as well as the native vegetation in the Great Salt Lake basin. The study included conducting a literature review of the evapotranspiration of Phragmites and other native plant species, quantifying the areal extent of phragmites, and developing a conceptual model to estimate the consumptive water use by Phragmites.</i>		
5 - Great Salt Lake Research Priorities - Update	2017	SWCA
<i>This project updated our 2012 list and prioritized important research topics that still need to be addressed in order to help make decisions regarding the health and sustainability of Great Salt Lake. GSLAC achieved success with the 2012 project resulting in most of its then-high priority research being funded. The same methodology was used for the 2017 research priority project, and anticipates that it will also provide insight into research topics and priorities, and attract funding to priority topics. Lake experts were again surveyed and collaboratively prioritized the research projects that were most needed for the lake. Research focus areas included hydrodynamics and hydrology, ecology, air quality, nutrient loading and cycling, recreation, and wildlife.</i>		
6 - Water for Great Salt Lake	2017	SWCA
<i>This document provides a summary of 72 potential strategies to maintain and/or increase the surface elevation/water levels of Great Salt Lake. The 72 strategies comprise submissions from a wide range of individuals and organizations. Highlighted in the document are legal, operational, structural, environmental and collaborative opportunities to bring water to the lake. During 2018 the Council prioritized some of the strategies for further analysis and implementation.</i>		
7 - Great Salt Lake Integrated Water Resources Model (GSLIM)	2018	Jacobs
<i>In 2013 the Council recommended development of an integrated water resource management model. Development of the GSLIM model for the Great Salt Lake (GSL) watershed was intended to allow state agencies to better understand the relationship among upstream water use, GSL water levels and salinity. The GSLIM model informs resource management decisions by characterizing and evaluating linkages between the GSL watershed and resources provided by the lake. It supports the state's mandate for sustainable lake management.</i>		

8 - Great Salt Lake Salinity Advisory Committee	2019	Jacobs
<i>This project established the Salinity Advisory Committee, a group dedicated to providing guidance and recommendations to the Utah Division of Forestry, Fire and State Lands and the Utah Division of Water Quality regarding the long-term management of salinity in Great Salt Lake. The focus of this group has been to review and interpret GSL salinity research results and monitoring data, and prepare recommendations regarding potential modifications to the adaptive management features of the 2016 Union Pacific Railroad causeway opening, berm or channel.</i>		
9 - Consequences of Drying Lake Systems Around the World	2019	AECOM
<i>This report examined the impacts of desiccation of eight terminal saline lakes around the world. This report disclosed the ecological, economic and health impacts of declining lake levels at Lake Urmia and Bakhtegan Lake in Iran; Aral Sea between Kazakstan and Uzbekistan; Lake Poopo in Bolivia; Owens Lake, Salton Sea and Mono Lake in California; and the Dead Sea in Israel and Jordan. It concluded that drying of saline lakes around the world costs billions of dollars in economic losses and mitigation efforts and causes severe harm to human health and the environment.</i>		
10 - Assessment of Potential Costs of a Declining Great Salt Lake	2019	EcoNorthwest
<i>This report assesses the potential costs of declining lake levels in Great Salt Lake. A sustained decrease in water levels could result in losses totaling \$1.69 - \$2.17 billion per year and job losses of over 6,500 positions, as well as negative health impacts, reductions in the quality of life for residents of and visitors to northern Utah, decline in lake effect snow, and significant harm to bird populations.</i>		
11 - GSLIM Model Integration – Assessment of Future Conditions	2019	Jacobs
<i>This report utilized the GSLIM model to better understand the sensitivity of Great Salt Lake water levels and salinity to potential changes in its watershed and to begin to screen potential management strategies. The study uses four growth and development scenarios to assess impacts on GSL water levels. The scenarios suggested further declines in water surface elevation ranging from 1.2 feet to 11.7 feet depending on how the State manages growth.</i>		

12 - Water Strategies for Great Salt Lake: Legal Analysis and Review of Select Water Strategies	2020	Clyde Snow
<i>As a follow up to the 2017 "Water for GSL" report that provided 72 strategies to get water to GSL, the Council identified 12 priority strategies for feasibility assessment and detailed review. This report analyzes each strategy from a legal and technical perspective and provides decision makers with context, considerations and action options for realizing greater lake levels. It concludes that the 12 strategies are feasible and can improve water management, increase water deliveries to GSL, and protect the lake.</i>		
13 - HCR-10: Recommendations to Ensure Adequate Water Flows to Great Salt Lake and its Wetlands	2020	Jacobs
<i>In response to 2019 legislation proposed by the Council, entitled the "Concurrent Resolution to Address Declining Water Levels of the Great Salt Lake," DNR and DEQ convened stakeholders, experts, water users and agency officials to collaboratively develop recommendations to ensure adequate water flows to Great Salt Lake and its wetlands. The Council funded a facilitator and report preparation. The group developed 16 Strategic Opportunities to get water to the lake and 60 specific recommendations to address those opportunities.</i>		
14 - Conservation Impacts Study	2020	Bowen Collins
<i>This report provides an understanding of the potential favorable impacts of water conservation on water availability, resource planning and the timing of large water development projects. This evaluation focuses on four primary water providers in northern Utah. Included in the report is an action plan of additional studies needed to assist policy makers with the role of conservation in future water resource planning.</i>		
15 - GSL Public Relations	2020-2021	R&R Partners
<i>GSLAC has commissioned or supported numerous important studies, reports, and assessments addressing Great Salt Lake. To help share this valuable and important information, and to help inform the debate over GSL issues, GSLAC contracted with a public relations firm. The firm developed a communications strategy, provided media training for the state's Great Salt Lake Coordinator, drafted talking points and numerous press releases, and prepared videos and a fact sheet promoting the lake.</i>		
16 - GSLIM Updates and Division of Water Resources Training	2021	Jacobs
<i>The initial development of the Great Salt Lake Integrated Resources Model (GSLIM) was completed in 2018. Subsequently, we have supported updates and improvements for its optimal accuracy. The model was transferred to the Division of Water Resource to ensure proper updates and a successful transition. The Council funded some of the model updates as well as training time for Division staff.</i>		

17 - Quantifying Nutrient Mass of Great Salt Lake	2024	USGS
<i>Adequate nutrients are essential for a healthy Great Salt Lake brine shrimp population and resource. A high research priority for the lake is to understand nutrient sources and cycling. Data collected for this project: 1) quantifies nutrient mass from multiple pools of GSL; 2) estimates nutrient flux rates; 3) estimates nutrient burial in sediments; and 4) identifies processes affecting nutrient partitioning and cycling.</i>		
18 - Water Reuse Study	2021	WFWQC
<i>This report examines the impact of water reuse on Great Salt Lake. Potential reuse quantities at eleven major wastewater treatment facilities along the Wasatch Front were provided. The study concluded that the possible depletion to Great Salt Lake from water reuse could range from 10 to 20 inches.</i>		
19 - Conservation Impacts Study – Expansion	2021	Bowen Collins
<i>This project expanded the 2020 Conservation Impacts Study to examine how conservation in the Metropolitan Water District of Salt Lake and Sandy would impact water demands within the district itself and flows to Great Salt Lake.</i>		
20 – Great Salt Lake Equation of State Update	2022	USGS
<i>The objective of this project is to evaluate and improve the accuracy of salinity calculations for Great Salt Lake. The project evaluates the accuracy of the “equation of state” for describing south arm water with a wider range of salinity and density values than were used to develop the initial equation back in 2011. The project also considers the equation for its potential to describe the more saline north arm water.</i>		
21 - Water and Land Use Planning Integration	2021	Babbitt Center
<i>The integration of water planning into land use planning has been identified as an impactful way to reduce municipal and industrial water consumption. This project is Phase 1 of a two-phase project. Phase 1 of the project developed an assessment framework and related supporting materials to be used by local governments and communities and to reach out to communities to assess their interest in being involved in the Phase 2 workshop that facilitates the integration of water into land use planning. Phase 2 will get underway in late-2021.</i>		
22 – Understanding Lake Effect Precipitation	2022	TBD
<i>This project will give us a greater understanding of lake effect snow as it relates, not only to the ski industry, but also to public water supply and historic water right production along the Wasatch Front. This project builds upon and interprets existing data that was cited in the Utah Division of Forestry, Fire and State Lands’ Comprehensive Management Plan. It will help inform the debate on lake elevation and quantify the importance of the lake effect.</i>		

23 – Discharge Monitoring at the New Breach	2022	USGS
<i>Monitoring of water and salt flows at the new Great Salt Lake causeway breach (West Crack breach) has been continuous since the breach was completed in 2016. Current funding for the discharge monitoring is expiring in September 2021. A disruption in data collection would be seriously adverse, particularly in the midst of the extreme drought that is contributing to declining lake levels while increasing salinity. The near-term discharge data is essential for determining modification options of the adaptive management feature of the breach.</i>		
24 – Great Salt Lake Watershed Dashboard and Interactive Mapper	2022	USGS
<i>The development of a Great Salt Lake watershed-specific dashboard will help stakeholders and advocates better understand what is happening in and around the lake regarding water flow, supplies and other parameters. It will increase communication and coordination regarding the lake. The dashboard will be maintained by USGS and look similar to the Walker Basin Hydro Mapper.</i>		
25 - Great Salt Lake Groundwater Studies	2023	USGS
<i>This research is intended to better quantify the contribution of groundwater to Great Salt Lake and its wetlands. Further, it will help water managers better understand the connection between groundwater, including shallow aquifers, and Great Salt Lake, including potential effects of changes in infiltration and runoff along the benches and in the valley.</i>		
26 – Union Pacific Railroad Causeway Breach Modeling	2022	USU
<i>This timely research predicts the effect of potential berm height increase on salinity driven flow through the railroad causeway breach. As the lake level continues to set new record lows, this modeling effort examines the impacts of decreasing the hyper-saline north arm into the south arm in order to minimize the impacts of increased salinity on the Great Salt Lake ecosystem. The modeling effort looks at increasing the berm height by 2, 4 and 6 feet.</i>		
27 - Bathymetric Lidar Pilot Project	2023	UGS
<i>The low lake levels have provided an opportunity for Utah Geological Survey to more accurately map the bathymetry of Great Salt Lake. Using the Bathymetric LiDAR on several targeted test areas on the lake bed, the study will allow researchers to better understand the depth and contours of the lake bed. Further, the pilot project will allow researchers to get a better understanding of the Microbialites locations. If successful, this mapping technique could be implemented across the entire lake bed.</i>		

28 - Great Salt Lake Shorebird Study	2023	Sageland Collaborative
<i>The Great Salt Lake ecosystem contains some of the most valuable wetlands for shorebirds in the western hemisphere. The wetlands degraded by phragmites and low water levels have led to likely decreases in shorebird populations. This study will evaluate the current distribution of shorebirds on Great Salt Lake. The updated data generated from this study will be valuable to wetland managers as they manage wetlands and phragmites during this period of low lake levels.</i>		
29 - Bear River Economic Study	2024	Cache Water
<i>The report will identify current economic contributions that the northern Utah region derives from the Bear River system, including detailed, evidence-based information about monetary and non-monetary contributions the river and its connection to Great Salt Lake provides, for use in decision-making about the Bear River.</i>		
30 – Volume and Area Estimates of Great Salt Lake	2024	USGS
<i>This research will develop a high-resolution topobathymetric dataset to provide accurate geospatial and volumetric data for current and future studies of Great Salt Lake. Previous datasets evaluate bathymetry at half-foot intervals, whereas this study will collect bathymetry data at 0.01 intervals. A finer resolution will better address management questions concerning water capacity, depth, and surface coverage.</i>		
31 – Great Salt Lake Enhancement Projects	2024	SWCA
<i>This list will gather information from a diverse pool of stakeholders regarding proposed projects that surround Great Salt Lake. The project report will emphasize on-the-ground work and engineered solutions, but will also include research and data development. The project report will serve as a reference document for stakeholders interested in completing projects to benefit Great Salt Lake.</i>		
32 – Water Conservation Toolbox	2024	TBD
<i>This study is intended to provide municipalities and other local governments with tools to help implement levels of water conservation needed to live with existing water supplies, while preserving existing flows to Great Salt Lake. The project will provide tools needed to reverse the expanding upstream development of water resources and implement water conservation orderly and expeditiously.</i>		