FRIENDS of *Great Salt Lake*

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Reflections Reinterpretation, Alejandro Pabon

The mission of FRIENDS of Great Salt Lake is to preserve and protect the Great Salt Lake ecosystem and to increase public awareness and appreciation of the Lake through education, research, advocacy, and the arts.

www.fogsl.org

Executive Director's Message

The Whole World is Watching—
It's Time to Focus on a Target Elevation Range for the Lake So We Can Translate Water Conservation Outcomes Into Water Inflows for Great Salt Lake

"Keep doing what you're doing."

My Lyft driver's response when I told him about FRIENDS of Great Salt Lake

Great Salt Lake is a reflection of who we are and how we are. Whenever I'm invited to share a presentation about the Lake and the work that FRIENDS does on its behalf, I begin by stating the obvious—we live along the shores of something GREAT—Great Salt Lake. And whether we perceive it or not, during its relatively short life-span as a remnant of ancient Lake Bonneville, it has affected all of us: from the ancients who lived in the Great Salt Lake wetlands, to the growing populations of today and tomorrow. The Lake effect not only covers the mountains in snow, but it continues to modify, influence, and impress our lives and the lives of millions of migratory birds that rely on it.

I've been thinking a lot about our Lake, as I'm prone to do. The impressive surge of global media coverage surrounding its decline, the welcome but long-awaited legislative tools (coupled with $.5B in funding) to support water conservation and obtain water shares for the Lake, and the recurrent and heartfelt emotional declarations that are shared by so many are all fundamental to our efforts to achieve positive results for Great Salt Lake. And although I realize translating words into actions can take time, I keep checking my watch to see just how long it's going to take for us to begin with the essential task at hand of bringing water to the Lake. Yes, we have drought exacerbated by climate change but we can't let that discourage us from moving forward.

When it comes to Great Salt Lake, size matters.

We know that water fluctuations have always been a part of the Lake's character. Fluctuations in a shallow terminal lake that have exhibited remarkable highs—least we forget 1986-87 during the super El Nino climate cycle in the Intermountain West. At that time, the Lake came back with a roar achieving an historic record high elevation of 4,212'asl with a watery footprint of 3,300 sq. mi. This, after a remarkable historic record low of 4,191.3' in 1963 at 950 sq. mi. We also know, thanks to Dr. Wayne Wurtsbaugh et al, that since statehood, the Lake has dropped by 11.1' from upstream diversions. Diversions that have reduced the Lake's volume by 48%. Contributing factors include agriculture 63% (7'), mineral extraction 13% (1.4'), municipal & industrial 11% (1.3'), impounded wetlands 10% (1.1'), and reservoir evaporation 3% (0.3').

We use these fluctuations as reference points in our ongoing discussions about salinity concentrations, navigation, wildlife habitat, industries, and the viability of the food web and productivity of the system. These comprise significant ecological and economic values inherent in Great Salt Lake. Thanks to best available sound science and examples from other saline systems globally, we know that as Lake levels decline, salinity concentrations increase and have a direct effect on these important values. And thanks to Dr. Kevin Perry, University of Utah Dept. of Atmospheric Sciences, and others who are studying the exposed lakebed, we can factor air quality impacts into the mix.

This past summer and into early September, we wilted under relentless record breaking 100-degree temperatures with little or no rain for relief. This was preceded by an extremely disappointing water year that resulted in the Lake dropping below the 1963 historic record low twice to its current low of 4,188.9'. With these conditions, compounded by continued diversions from surface water inflows to the Lake, and from withdrawals by mineral extraction operations from the Lake, salinity concentrations in Gilbert Bay increased to 180 g/L or 18 %. This concentration has been determined by the Great Salt Lake Ecosystem Program Technical Advisory Group (Utah Division of Wildlife Resources) as being life-threatening to brine shrimp and brine fly populations. Populations that not only provide an important food source for millions of migratory birds, but also brine shrimp cysts that are used in aquaculture operations which are an important food source for global populations.

With this as a catalyst, the Great Salt Lake Salinity Advisory Committee recommended that "the State of Utah immediately begin planning, permitting, and construction of temporary modifications to the flow-control berm at the new Union Pacific causeway bridge." The causeway bridge divides Gunnison Bay (North Arm) and Gilbert Bay (South Arm) of the Lake. The GSL Salinity Advisory Committee was established in 2017 to provide recommendations for long-term adaptive management of salinity of the

Lake to the Utah Division of Forestry, Fire & State Lands (DFFSL) and the Division of Water Quality. Adjustments to the berm were recently accomplished to reduce the salinity coming from Gunnison Bay to Gilbert Bay.

What we've been seeing under these conditions are clear calls for urgency. Vast beds of microbialites located in the marginal zones of the Lake that are immediately vulnerable to water loss are drying up. In turn, algal matts that cover them contribute to the life cycle of brine flies, browse for brine shrimp, and are responsible for 33% of the photosynthesis productivity in the Lake are also drying up. With that, if you consider Eared Grebes and Wilson's Phalaropes and their particular reliance on these food sources it's quite staggering. The world's largest staging concentrations of Wilson's Phalaropes was responsible for Great Salt Lake's designation as a Western Hemispheric Shorebird Reserve Network Site in 1991—a remarkable designation for a saline system to achieve. For Eared Grebes, bird surveys have recorded as many as 5 million of them coming to the Lake. While here, they double their body weight on brine shrimp and brine flies during their molting process and store the energy they need before they fly south for the winter. The impacts on these food sources are anticipated to be so significant that both species could become candidates for listing under the Endangered Species Act.

It's time to raise the long pole and track a course of action for the Lake's future.

We need to translate water conservation outcomes into water inflows for the Lake. That course of action would focus on a target elevation range with sustained inflows over the course of 10-20+ years along with annual funding support to provide us with a basis to evaluate how our collective water efforts are translating into results. The good news is that in addition to the legislative tools available, and a veritable library of important references provided by the GSL Advisory Council, we have other tools that can help take us there. Thanks to the development of the GSL Elevation Matrix, we can better understand how Lake elevation plays a significant role in the effects on these ecosystem services (you can take a look at the Matrix for yourself on our website: www.fogsl.org/about/map).The Matrix is an integral part of the design of the 2013 GSL Comprehensive Management Plan to provide guidance for the DFFSL and serves to help inform timely and effective jurisdictional management decisions for the Lake as a Public Trust resource—a Public Trust resource that by law is to be managed in perpetuity for the people of Utah.

In short, the framework of the Matrix is based on a range of Lake elevations between 4,188'- 4,213'. The spectrum of ecosystem values/services associated with each of these elevations was identified by the DFFSL from both sufficient data from literature as well as input from at least three dozen stakeholders representing a variety of interests. Within this range of elevations is a sweet spot of 4,198'- 4,205' where most of those values or services get the biggest bang for the buck. As elevation changes occur and the Lake gets lower, you can see how these values are impacted. The same happens with rising Lake levels. If we focus on beneficial values associated with navigation, reducing salinity concentrations to support the food web and productivity of the system, and wildlife habitats, 4,198'- 4,201' looks like a good target range to shoot for. This range would also satisfy Dr. Perry's recommendation of an additional 10' to make a difference in covering up dust contributions from the exposed lakebed.

Yes, advocating for a target elevation range that's a full 10' higher than where the Lake currently sits is both ambitious and challenging, but how can we not step up for Great Salt Lake's future? And, if the target range you would advocate for is different from mine, that's fine, let's talk about it. But that's the key—we need to start the conversation; we need to set our goal of what elevation we're aiming for with the Lake. And if for no other reason, let's do it for the future generations of people and the millions of migratory birds that will rely on the Lake for sustenance. We need all hands on deck!

> "He is walking along Thirteenth East Street on an absolutely perfect morning, a creation morning. Perhaps there was a shower during the night, but it feels as if prehistoric Lake Bonneville has risen silently in the dark, overflowing its old beach terraces one by one, flooding the Stansbury, then the Provo, on which this street is laid, then finally the Bonneville; filling the valley to overflowing, stretching a hundred miles westward into the desert, lapping against the Wasatch, pushing long fjords into the canyons, washing away all the winter smoke, softening the alluvial gravels, rinsing and freshening every leaf of every shrub and tree, greening every blade of grass; and then before daylight has withdrawn again into its salty remnant, leaving behind this universal sparkle and brightness."
>
> —from *Recapitulation* by Wallace Stegner

In saline,
Lynn

Friends' Organizational Statement

Founded in 1994, FRIENDS of Great Salt Lake is a membership-based nonprofit 501c3 with the mission to preserve and protect Great Salt Lake ecosystems and increase public awareness and appreciation of the Lake through education, research, advocacy, and the arts. The long-term vision of FRIENDS is to achieve comprehensive watershed-based restoration and protection for the Great Salt Lake ecosystem.

FRIENDS of Great Salt Lake sponsors programs related to our mission statement: Lakeside Learning, the Doyle W. Stephens Scholarship, the Great Salt Lake Issues Forum, and the Alfred Lambourne Prize.

Lakeside Learning Field facilitates 2.5 hour inquiry-based educational field trips for 4th grade students. The trips combine informal environmental education strategies while incorporating science, technology, engineering, art and math (STEAM) to reinforce the Utah Common Core State Science Standards. Lakeside Learning emphasizes learning through participation.

Within the research component of our mission, we sponsor the Doyle W. Stephens Scholarship for undergraduate or graduate research on Great Salt Lake ecosystems. Established in 2002, the scholarship supports students in new or on-going research focused within the Great Salt Lake watershed. Recent project winners span the effects of changing salinity on microbialites to the impacts low water levels in Great Salt Lake have on Utah's air quality.

FRIENDS is actively involved in advocating for Great Salt Lake. Every two years, FRIENDS hosts the Great Salt Lake Issues Forum to provide focused discussions about the Lake for a variety of stakeholders including policy makers, researchers, and industry leaders. Each Forum engages the community in constructive dialogue regarding the future of Great Salt Lake.

In 2014, FRIENDS established the annual Alfred Lambourne Prize for creative expressions of our Inland Sea in the categories of visual art, literary art, sound, and movement. FRIENDS celebrates the relationship between local artists and one of Utah's most precious natural resources, Great Salt Lake. Through artistic expressions, we enhance our capacity to build awareness about the Lake and our need to preserve and protect it for the future.

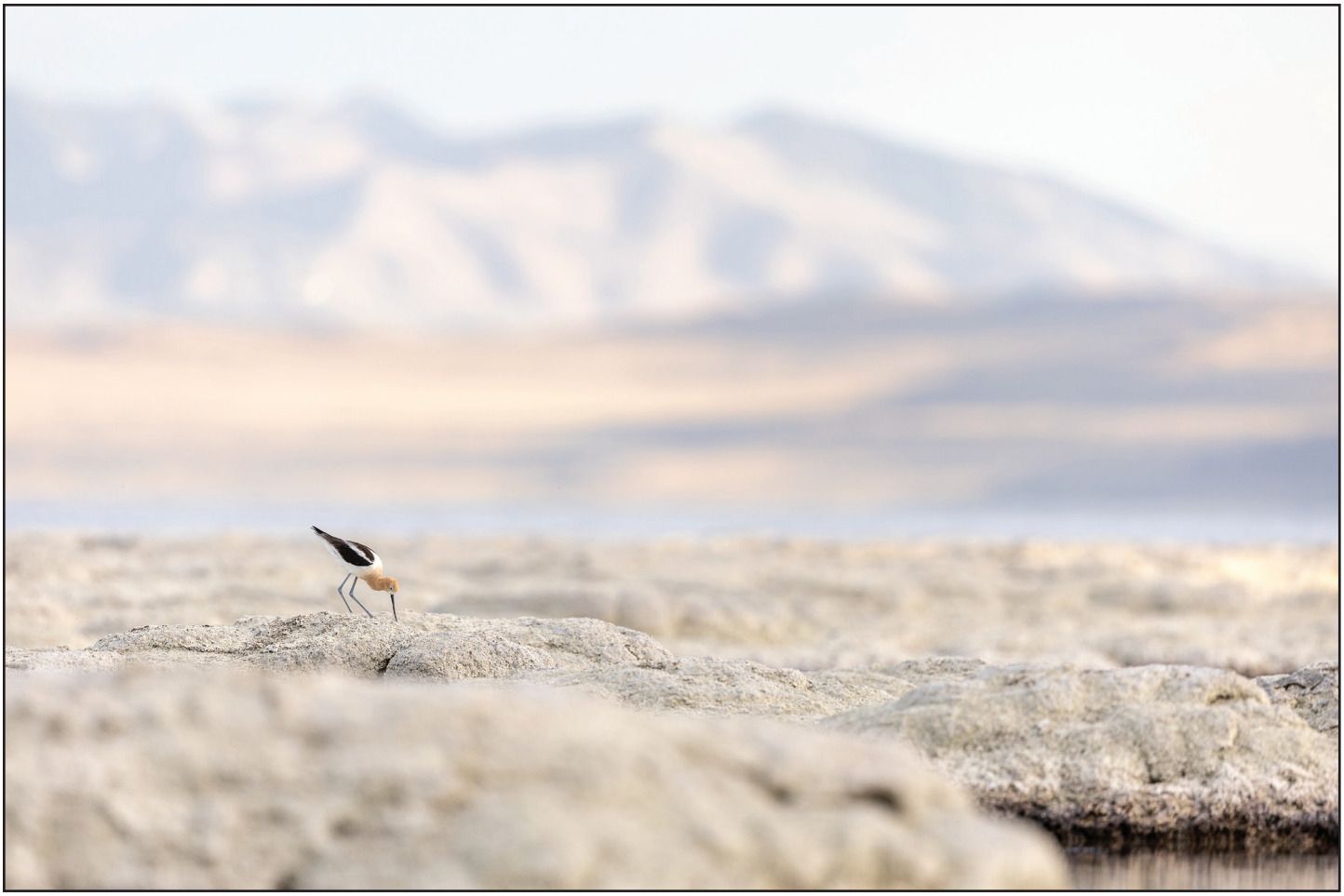
FRIENDS maintains a Board of Directors and Advisory Board composed of professionals within the scientific, academic, planning, legal, arts, and education communities. Staff members include, Lynn de Freitas, Executive Director; Rob Dubuc, General Counsel; Holly Simonsen, Membership & Programs Director; Katie Newburn, Education & Outreach Director; and Alyssa Garrett, Education Coordinator.

On The Cover:

Reflections Reinterpretation, acrylic, 24 x 30

Alejandro Pabon

Recently, a client asked if a painting of mine, *Reflections*, was available for sale. *Reflections* had gone to different hands, so I offered to reinterpret the painting. I enjoyed painting this image again. I have lived many rich, intense experiences since I first painted *Reflections*. We have all changed since, including Great Salt Lake. Change is the natural course of things. Nothing stops change. After seeing the finished commission, my client shared the following with me: "Something close to my heart is that the Lake is shrinking...and that feels impossible. How could such a vast creation of nature be in danger? How did I take for granted seeing it every day as I was growing up, never fathoming that it could disappear?" Humans are accelerating the decay of Great Salt Lake. However, we have the means to slow the demise of the Lake. We have the moral responsibility to act now. We hope the efforts to preserve Great Salt Lake do not go in vain. May this piece, and the thoughts behind its creation, contribute to the efforts to preserve and protect Great Salt Lake.



An American Avocet plucks at insects on the exposed microbialite reef of the drying Great Salt Lake.

photograph by Mary Anne Karren

Linking Communities, Wetlands & Migratory Birds in the Western Hemisphere

June 6, 2001: In a few days the first Polar Bear will come ashore in the Churchill area of Hudson Bay. We are standing in Joe Jehl's study area. The vicinity is gridded into polygons for studying nest site fidelity of subarctic shorebirds. Joe motions to me, as he pulls his mosquito net tightly over his brow, "In this transect, probably below that hummock in the lower sedge, we should find a Least Sandpiper" Unlike pulling a rabbit out of a hat, Joe's data and past experience produced the sandpiper that day. She had identifying bands on both legs that tied her to that polygon address in that Churchill neighborhood. Joe's interest in shorebird philopatry and nest site fidelity has brought Joe back to Churchill for many years, largely because many of the banded birds keep coming back. Remarkably, many of these Least Sandpipers, Dunlins, and other shorebirds of the arctic and subarctic winter thousands of miles from their nest sites. Joe's banded birds have helped paint this life-history story.

Wilson's Phalarope, photograph courtesy of Don Paul

Shorebird biologists have learned that many shorebird species nest across the broad sweep of arctic environments, but come together at strategic sites to molt and fatten before flying to wintering sites. They have evolved to follow invertebrate abundance. Their diet includes arctic swarms of mosquitoes and the profuse halophiles of salt lakes. Like an ecological drum beat, they course the skies from one resource to another in one continuous round. Each site is relevant.

During the early 1980s, biologists at Great Salt Lake (GSL) began collecting population information on certain shorebird species. First up was the Wilson's Phalarope, then Snowy Plovers. In the process of collecting these specific data, it became apparent that GSL also hosted significant populations of other shorebird species. Regional and International shorebird surveys had recently been undertaken within the western hemisphere. This sharpened the image of how the birds were using the landscape.

During the mid 1980s, a group of shorebird scientists from Canada, United States, and Latin America created the Western Hemisphere Shorebird Reserve Network (WHSRN). WHSRN's mission is to conserve shorebirds and their habitats across the Americas through action at a network of key sites. To start, WHSRN participants assessed shorebird populations and thus the value of each site in the WHSRN network. At each site, it was critical to recruit major landowners to help conserve shorebird habitat.

In 1989, I answered a questionnaire from the Manomet Center for Conservation Science requesting shorebird data from GSL. I remember filling it out with a pen, thinking that we actually had some reliable information to share. As it turned out, the numbers of Wilson's Phalaropes met the WHSRN qualifications for GSL to be a site of Hemispheric Importance (500,000 individuals or 30% of the population). We met the requirement with one species! But to become a WHSRN site, the landowners of GSL and its associated wetlands had to agree to fully support its inclusion as a WHSRN site. While many landowners already supported WHSRN, the biggest landowner, the State of Utah, the lakebed's owner, took a bit more time to sign on. But sign they did!

With significant funding from the North American Commission for Environmental Cooperation, the Linking Communities, Wetlands, and Migratory Birds (Linking) program was set up. The program sought to "strengthen the awareness and capacity of local community groups by providing resources that will conserve and sustain their neighboring wetland sites." Great Salt Lake, Chaplin Lake in Saskatchewan, and the Marismas Nacionales, in Nayarit, Mexico were the initial Linking sites. Thus began a 20-year

international experiment bringing distant communities together on many fronts of conservation biology.

Each lake community worked together in three areas: Education, Conservation, and Ecotourism.

Environmental Education: The program uses the USFWS Shorebird Sister Schools curriculum in both Spanish and English. Over time this has included teacher exchanges and shared student projects between schools and universities.

Wilson's Phalaropes, photograph courtesy of Don Paul

Conservation: The Mexican Secretariat for Natural Resources, Utah Division of Wildlife Services, U.S. Fish and Wildlife Service, U.S. Geological Survey, Canadian Fish and Wildlife, Weber State Department of Zoology biologists, and others provide the science to help understand and assess the bird and habitat needs at and between each site. NGOs, especially Rio Tinto BirdLife partner Kennecott Copper, provided essential financial resources and hemispheric vision recently. FRIENDS of Great Salt Lake was particularly valuable in focusing conservation need through their GSL Issues Forum initiative. Cooperative training, surveys, species-specific biologic need, and life history studies were shared. Major baseline studies at GSL and the Marismas Nacionales added to the conservation need and condition of shorebird habitats.

Ecotourism: Linking implemented guide training, bird festivals, and eco-tourism planning. In 1999, the GSL Bird Festival began, in part due to Linking. This festival inspired the San Blas Bird Festival, and, together with the Chaplin Lake Bird Festival, a trinational bird festival partnership began. Each festival provides an important venue for Linking partners to meet, celebrate, and plan coordinated activities. Utah partners and eventually BirdLife International partners helped with ecotourism business planning for and with Mexican partners.

All these conservation actions happened because communities care. Many partners have been involved over the years. The list is long and behind every contribution are people who recognize, through Linking, they are important. Community actions at all levels is and was the key to success; after all, "linking" is the calling card.

Now a new chapter is unfolding with a recent grant provided to Sageland Collaborative from Utah Linking. Sageland, a partner in GSL conservation initiatives, will provide a situation assessment of where Linking is and a strategic plan to move forward. With increasing knowledge, technology, new and existing partnerships, Linking will continue to interlace conservation actions across the shorebird landscape.

Don S. Paul
AvianWest Inc.,
a Linking partner

U Save the Lake

For the past several years, I have been teaching a course I created called Art, Action, & the Environment for the Honors College at the University of Utah. This course explores art, environmentalism, and activism with research and art-making activities. Each class choses the local environmental issue they want to focus on for their collaborative, capstone project, a socially engaged art event. During the spring semester 2022, this particular class chose to focus on the drying of Great Salt Lake as their local environmental issue. They titled their event U Save the Lake.

U Save the Lake was held just before Earth Day on April 21, 2022 to bring awareness to the rapid shrinking of Great Salt Lake. The class' project focused on multiple aspects such as the diversion of the Bear River, the effects of the Lake shrinking on snowpack, air quality, and the immense scale of the proposed Inland Port, as well as impactful legislation surrounding this issue.

This diverse team of Honors students—with disciplines ranging from Nursing, Kinesthesiology, Chemical Engineering, Film and Media to Environmental Studies—explored the intersection between the arts and environmental action, learning how to bring awareness to their community about the drying of Great Salt Lake in an engaging and creative way.

[Image 2],photograph courtesy of Amelia Walchli

During the event on April 21st, 2022 at the University of Utah's Marriott Library Plaza, students shared information about the shrinking of Great Salt Lake to the campus community. They printed a large-scale sign with a pledge for personal water conservation. When a passerby signed it, they received an ice pop and the students discussed with them how personal water conservation directly impacts snow pack. The pledge included turning off the faucet, taking shorter showers, washing full laundry loads, and holding others accountable. Over 75 signatures were obtained on the pledge for personal water conservation.


[Image 1], photograph courtesy of Amelia Walchli

Next to the table with the pledge, was a sculpture made of a faux dirt mound and a pair of skis sticking out, similar to the way skiers stick their skis and poles in snow [Image 1]. If we continue to lose our snow pack, we won't have snow to ski on. The sculpture served as a grave image of this possibility. Participants also received a custom designed sticker reflecting the grave nature of skiing in the future, should we not take the needed action now.

Two large images, laid on the ground, showed the scale of the proposed Inland Port at 16,000 acres next to the scale of the SLC International Airport at 7,700 acres [Image 2]. This stark visual showed the enormous scale of the proposed Inland Port and just how impactful it will be to our valley. Students drafted a petition to Governor Cox, pleading that the Utah legislature enact regulations to minimize the negative impacts of

[Image 3], photograph courtesy of Amelia Walchli

the Inland Port on the health of both humans and the natural ecosystem, since the construction of the Inland Port seems inevitable. Over 260 signatures were acquired and mailed to Governor Cox. Passersby also received stickers that were custom designed with images of 3 birds common to the Great Salt Lake ecosystem [Image 4]. They were accompanied by catchy phrases to grab attention to their plight, and with the eco-art website that the students designed with additional information including links to local organizations such as FRIENDS of Great Salt Lake.

[Image 4], photograph courtesy of Amelia Walchli

In addition, they had an interactive, custom cornhole game that was composed of three parts [Image 3]. The three parts were painted with the shrinking Bear River as the main source of water for GSL. They were labeled Past, with a large hole, Present, with a medium hole, and Future, with a hole too small to actually play the game. This represented the diversion of the water from the Bear River away from GSL. Participants engaged in conversations about this diversion of the Bear River and the necessity to keep it in GSL as the Bear River provides 60% of the water to the Lake and the diversion significantly contributes to its historically low level.

All who approached the table and engaged in conversations received free salty snacks: salt water taffy and sea salt caramels. Support for this event was received from the Sustainable Campus Initiative Fund through a SCIF Grant, the University of Utah's green grant program.

Great Salt Lake impacts many different aspects of life here in Salt Lake City and if this problem isn't addressed immediately, we will begin to see increased dust storms and increased poor air quality, less snowfall, and continue to lose precious habitat for the wildlife that inhabit and migrate through the Lake and surrounding areas. The students created pages on the website dedicated to this class, to provide more information for the community at large. Learn more at ecoart.art.utah.edu as we are all responsible for saving Great Salt Lake.

Wendy Wischer
Artist and Associate Professor in
Sculpture Intermedia at the University of Utah

The Danger of a Diversion

Great Salt Lake's rapid decline—mirroring that of Lake Powell and Lake Mead and the Salton Sea—has generated many ideas and proposals. Some of these, such as reducing the use of water that would otherwise flow to the Lake by promoting municipal and agricultural conservation and by ensuring that the Bear River continues to replenish the Lake, are proven methods that can be implemented quickly and at relatively low cost.

Other proposals—such as importing water from the Pacific Ocean more than 700 miles and more than 4,000 feet uphill—are dangerous diversions from the immediate crisis confronting Great Salt Lake, the ecosystem and industries that depend on it, and the people who live downwind. The chief challenge to importing water is the scale of such an effort: it would be a massive undertaking (700 miles!) requiring more power than Hoover Dam and Glen Canyon Dam produce (combined!), decades of design, easements, construction, and permitting (through the California Coastal Commission and others). It would cost tens of billions of dollars (plus tens of millions each year to operate and maintain), only to bring in tens of millions of tons of additional salts into the Lake each year (about as much salt as is produced in the U.S. as a whole each year).

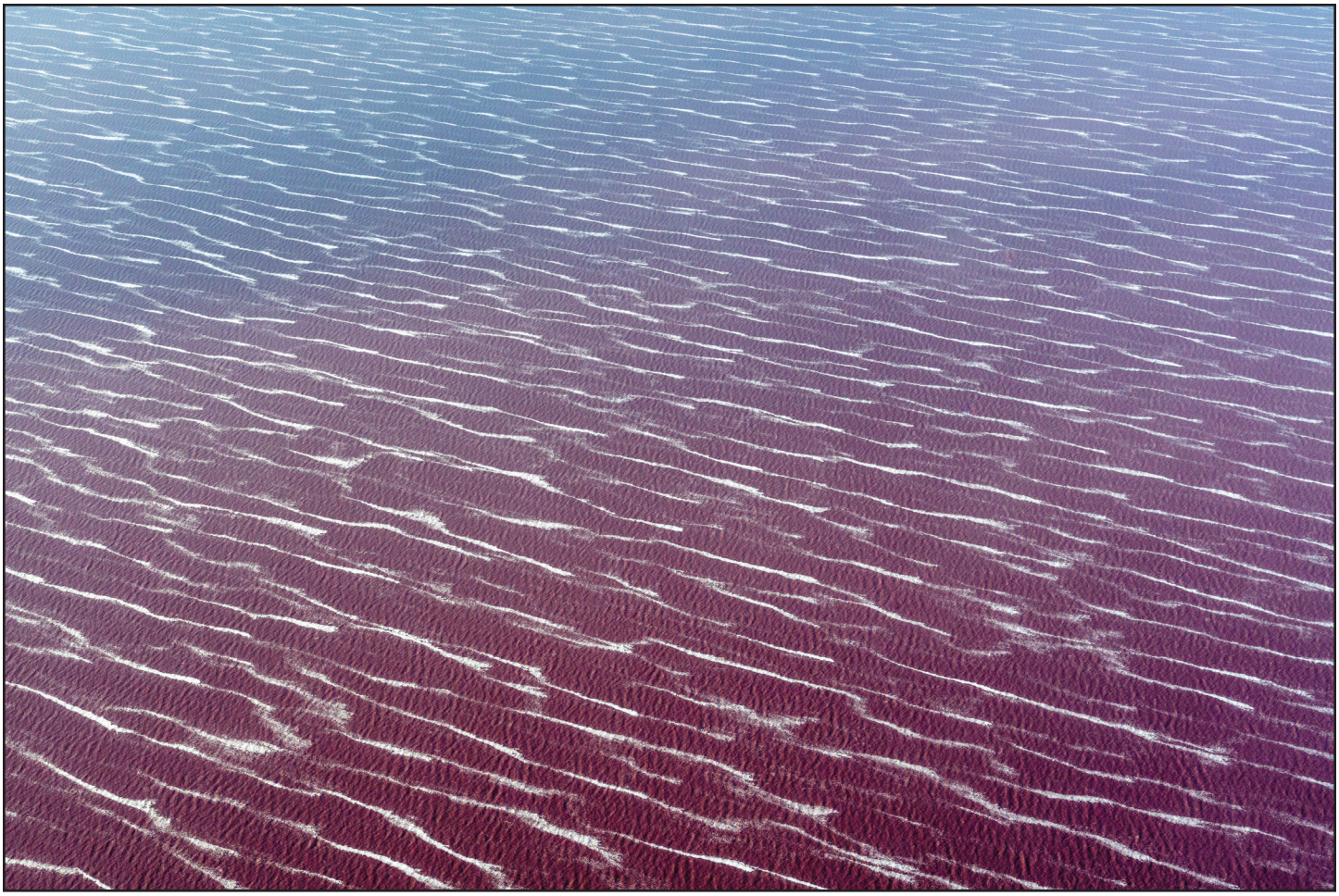
The idea that ocean water would benefit Great Salt Lake seems intuitive, but is ultimately wrong. Water flows into the Lake and evaporates, leaving salt behind to concentrate. A gallon of ocean water has about sixty times more salt in it than does a gallon of the water currently flowing into the Lake. Importing ocean water to the Lake would bring in enough salt to fill Temple Square, high enough to cover Moroni's trumpet, every year. All those new ocean salts would rapidly increase the salinity of the Lake, making it inhospitable to the brine shrimp and brine flies that currently thrive there, turning it into a brine lake suitable only for bacteria and viruses.

Some import proponents have said that desalination plants could solve that problem. Scale is important here, once again. The desalination plant at Carlsbad, California produces about 55,000 acre-feet of water per year, at a cost of about $2,100 per acre-foot. The Carlsbad plant is about 50% efficient: for every two gallons of ocean water pumped into the plant, it produces about one gallon of fresh water and dumps the other gallon back in the ocean. Importing ocean water to stabilize Great Salt Lake at an elevation of around 4,198' and at roughly current salinity could take as many as 18 Carlsbad-sized desalination plants.

In May, the California Coastal Commission rejected a proposal to build a desalination plant in Huntington Beach; it's unlikely that the Commission would approve a proposal to build the 18 plants needed to benefit Utah. Desalination plants could be constructed along the pipeline route, but then you would need to import about twice as much water—significantly increasing construction and energy costs—and find a place to discharge massive quantities of very salty water, continually.

Water in Gilbert Bay, photograph courtesy of EcoFlight

Importation would also take many years before it delivers a drop of water. San Diego is promoting a regional conveyance system with a much smaller capacity but similar lift requirements, with the following schedule:



Water in Gunnison Bay, photograph courtesy of EcoFlight

- Preparation of CEQA/NEPA reviews, preliminary designs, and agency consultations–5 years
- Permitting coordination and approvals, property acquisitions–2 years
- Technical report preparation and design of all facilities, including pipelines, tunnels, pump stations, and treatment plants–3 years
- Construction, testing, and project acceptance–15 years

In short, the San Diego import plan would require 25 years to become operational, to build a much shorter pipeline wholly within one state. Planning, permitting, and building a pipeline to Great Salt Lake would take even longer—time the Lake does not have.

For many years, people have promoted water importation proposals to stop the decline of California's Salton Sea. Recently, an independent review panel's fatal flaw analysis rejected 15 of 18 import proposals; a final report will be released in September. Years ago, I assessed the feasibility of some import/export proposals for the Salton Sea (see pacinst.org/salton-sea-import-export-plans), highlighting some of the challenges such proposals face, including: time, land use agreements, construction and energy costs, additional energy demands in the context of climate change, and the need to negotiate with a foreign country. Most of these also apply to proposals to import water to the Great Salt Lake (with the additional complication of the need to negotiate with both California and Nevada).

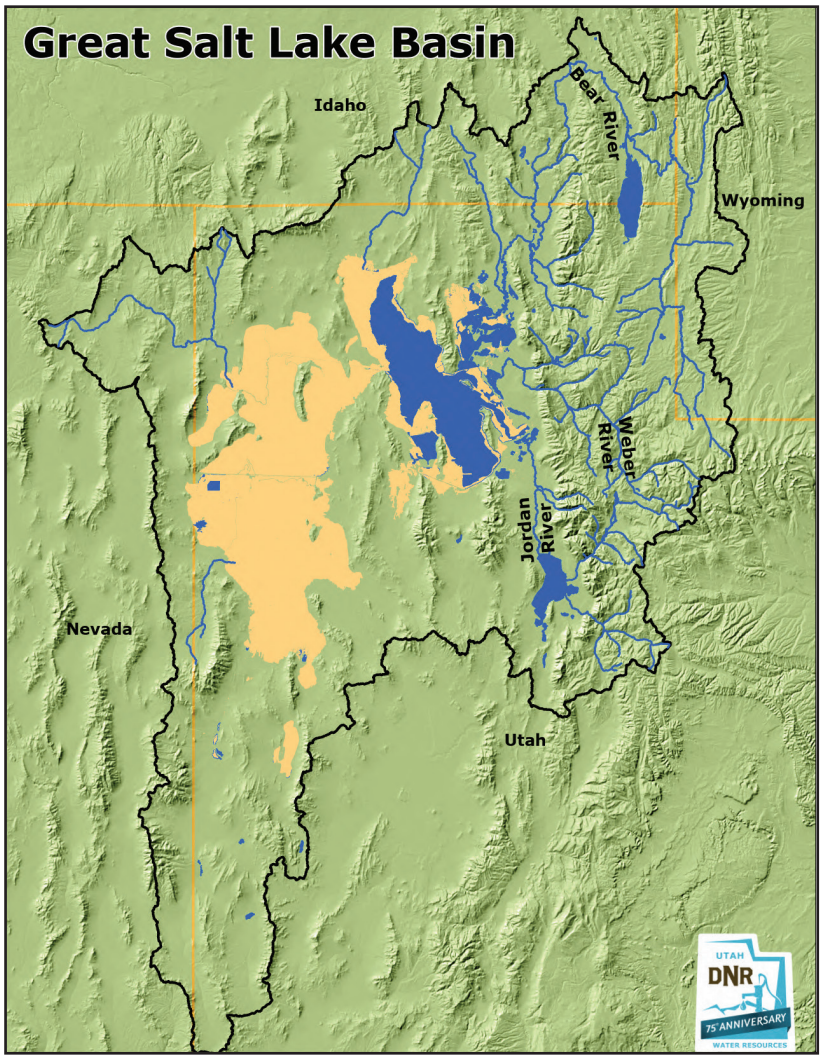
Rather than exploring infeasible and time-consuming water importation plans, Utah should work quickly to implement the impressive water conservation measures enacted earlier this year and stop watering lawns better suited for Kentucky or England. Saving Great Salt Lake will require a real effort, including a real accounting of the water flowing into the Lake now and into the future. Unrealistic plans to augment flows are a dangerous diversion, distracting us from the real tasks at hand.

Michael Cohen
Senior Associate
Pacific Institute

Now You See It; Now You Don't

Water is the Lifeblood of Great Salt Lake

Some would say the heart of Utah is Great Salt Lake (GSL). But until recently, many have not thought about the network of rivers and streams that feeds this heart, in other words, the GSL watershed or basin. The Great Salt Lake Basin covers 36,000 square miles and four states, including Utah, Wyoming, Idaho, and Nevada. The veins that feed this heart are both visible and invisible. From the map shown, you can see the GSL's primary arteries, namely the Bear, Weber, and Jordan rivers. Contributing to these rivers are countless tributaries, most of which are not shown, where water accumulates and meanders toward GSL, growing in size as tributary meets tributary.



Great Salt Lake Basin, courtesy of Utah Department of Natural Resources

A person wandering through the mountains may see a dry drainage, evidence of one of these tributaries once roaring during spring snowmelt. If this was found in the northern Wasatch and followed long enough, one would meet the Bear River and countless wetlands, greeting the senses with a pungent smell and the sound of exotic birds. A different passerby may find water bubbling from the ground, forming a trickle headed to GSL. These are springs, places where the groundwater meets the surface to become a visible flow. Groundwater forms an invisible web across the basin; some of this water sits in geologic formations watching the eras pass, caring little for GSL. But much of the groundwater is in constant communication with the basin, feeding springs, seeping into the streams, and flowing through the sand and silt to eventually find itself in GSL.

A different wanderer, one seeking lunar landscapes, may find themselves in the west desert—an arid environment with little precipitation. Still, snow falls and accumulates on the desert peaks formed from the pressures of geologic time and feeding the stream and groundwater during times of snowmelt and rain. Springs forming oases within the desert can be found, evidence of groundwater summoned toward the terminal lake under the influence of gravity. Here the water will evaporate skyward under the presence of the thirsty sun, a process that accumulates minerals, namely salt, and forms the unique ecosystem that is GSL.

Look away from the spring, and one will likely be surrounded by a reflective surface, a salt flat, its expanse shown as the light orange area surrounding GSL. A remnant of a once much larger lake. Off to the distance, the wanderer may see floating mountains in the sky, a mirage, but also real and a reminder of the origin of water within this basin. Anywhere one may wander within the black lines shown on the map are part of this complicated system, the GSL Basin. Water that falls here will either be consumed or find itself in GSL. Once you step into this basin, you become part of it—an influencer of the water's movement. Wander within its bounds and understand its complicated nature.

Tom Moore
Utah Division of Water Resources

Great Salt Lake Map

Basemap: USGS. Water level shown depicts approx. 4189'. For reference only.

Great Salt Lake historic average elevation 4,200' (1847-1986).

Approximate average elevation Fall, 2022 4,189'.

This map shows the contrast between the historic elevation average of 4,200′ (1847-1986) and the current elevation of 4,189′ (Fall 2022). It shows that islands, bays, habitat values, navigation and open water have been lost/compromised due to a declining elevation.

A Sense of Place and Our Ongoing Work to Protect It

You already know how important it is that we act right now to preserve Great Salt Lake and the amazing habitats it provides. Nearing the end of my first term in the legislature, I'm happy to note that there are many thoughtful, determined and powerful allies in this effort. The recognition seems to have fully set in, across the political spectrum, that we are facing an unprecedented, grave, even existential problem, and that unprecedented and immediate action is required. I look forward with great hope to the next legislative general session and to delivering solid help for the Lake. I'm exceedingly grateful for the pioneers in Lake protection like FRIENDS of Great Salt Lake who for years have been sounding the alarm. They are finally being heeded.

Sunset from Antelope Island Causeway (Spring 2022), photograph courtesy of Doug Owens

I don't know any greater sight than a sunset over the Lake. It puts me in my place. The Earth and sky prove that I am puny indeed, but I also feel at home and welcome.

The more I learn about the Lake, the more my commitment grows. I'll share a specific example. During a camping trip to Antelope Island years ago, my brother arranged for an outfitter to take us and the kids on a horse-back ride. (Incidentally, this same outfitter also supplied horses to Hollywood movie makers. The horse I was riding was the same one that Mel Gibson rode in the remake of "Maverick." It seemed like the horse was due more respect than having to haul me up Frary Peak.) The outfitter waived at rock outcroppings along the way. "That's called gneiss. It's the oldest rock in Utah. Two billion years." On top of the mountain, we absorbed what we could of the grandiosity on offer.

Later that day, at the Fielding Garr Ranch, the docent highlighted the spring-fed stock tanks. Deep fresh water under the cottonwoods. "When Brigham Young first came here, he said that this spring will never fail. And it never has." You'd think that spring would fail at least once in a while given the parched look of the low mountains on the island. But years later, a geologist explained that the spring is not fed from the precipitation on the island, but rather from precipitation in the much-higher Wasatch Mountains east across Farmington Bay. The water flows under the salt water to emerge fresh and clear in that spring. It's shielded from the salt water by bedrock dipping under Farmington Bay. And what is that bedrock? That two-billion-year-old gneiss.

I get stuck on that fact. The earth spent two billion years to create a reliable fresh water source on a dry island. How many birds have taken strength at that spring for their courageous journeys to distant lands?

> "What would the world be, once bereft
> Of wet and of wildness? Let them be left,
> O let them be left, wildness and wet;
> Long live the weeds and the wilderness yet."
>
> —from *Inversnaid* by Gerard Manley Hopkins

Doug Owens
District 36, Utah House of Representatives
Rep. Owens arranged for National Guard helicopters to fly the entire Utah Legislature from Capitol Hill to see the drying Great Salt Lake.

once we had everything

we had an island full of bison
we had a sky full of flight
we had a sea full of northern shovelers
in fall we had an ocean full of grebes—
divers with ruby eyes and dark lashes

we had everything
meadowlarks tuned the morning
coyotes crooned the night
we had beaches full of sand
and each grain
a spherical world
not ground, but grown

we had circles full of people
bearing stories,
some not easy to tell
and yet the tellers told them anyway—

we had a basin and a range
we lived on a sea floor
we wanted nothing more
than what we dreamt at night
as we slept in her generous bed
which once held all the water
the same water
which once held my mother
a 9-year looking to hers
and her mother who said
look, how the water
holds my large body,
she can hold you…
and then, my mother
laughing with delight

and we,
were once water too
mirroring the skies, we doubled heaven
we were lyrical, fluid, and lake-voiced—

we had a smell, ripe-with-life
we had salt in our eyes
we felt the sting!

we were a great
body reclaiming—
we were a basin
yearning to be full again—
we were a great lake
dreaming herself whole again—

once she had everything
once we had everything.

by nan seymour

The poem,"once we had everything," will be published in the book *irreplaceable* in early 2023, alongside many words of praise, including an 80-voice chorus from friends of Great Salt Lake. Read more of Nan Seymour's work in the 2021 and 2022 Alfred Lambourne Arts Program catalogs, availble at fogsl.org.

Working for the Future of Great Salt Lake

Most sixth graders jump at the chance to spend a day at Lagoon to ride roller coasters and hang out with their classmates. But when the annual school Lagoon day arrived, I begged my dad to let me go fishing instead. He dropped me off on a big bend of the Bear River where the catfish hide, and I enjoyed a full day of fishing by myself. It was the best day ever! I'm sure my classmates thought I was weird, and my mom probably worried a little about having her 11-year-old on a solo outdoor adventure. But it's one of my favorite memories. I still prefer fishing over Lagoon, and I head outdoors every chance I get.

Enjoying Utah's natural resources has been a passion of mine for as long as I can remember. Growing up in Box Elder County as a fifth-generation farmer and rancher, I learned to work hard and respect the land. I worked alongside my grandpa, dad, brothers, cousins, and uncle and found a direct correlation between our efforts and a successful harvest. We worked hard but also found time to play hard, often hunting on the Great Salt Lake marshes, swimming in the canals and fishing on the Bear River. Our ranch is located in Corinne near the Bear River Migratory Bird Refuge. Every year I enjoy watching thousands of migratory birds pass through our fields and surrounding wetlands.

Great Salt Lake and the Bear River that feeds it are at my back door and part of the landscape I love. The Lake, its ecosystem, and the recreational opportunities it provides have always been part of my life. When the Lake was at record-high water levels in the 80s, it looked much different than it does today. As a young boy, I remember checking on cattle with my dad and experiencing firsthand the floods and the devastating impacts they had on the Lake and surrounding ecosystem. The flooding in the 80s wiped out miles of fence on our ranch. I spent many summers as a boy rebuilding these fences and enjoying time with my grandpa. When I put a staple in a fence post, he told me to swing the hammer like lightning, never striking twice in the same place.

A drying Great Salt Lake has far-reaching consequences and could result in increased dust, reduced snow, reduced Lake access, increased salinity, and habitat loss that would significantly impact migrating bird populations and have negative economic consequences for the State. Many have taken the Lake and its unique ecosystem for granted, thinking it will always be there regardless of our actions. Unfortunately, it often takes a crisis to elevate an issue of this magnitude into the public eye. By protecting the Lake, we help our economy, environment, wildlife, and the future of our beautiful State.

I'm encouraged by people's interest in the Lake and the actions and investments underway to help save it. We've conserved billions of gallons of water this past year, made historic investments in conservation, and changed water policy that will benefit the Lake in the long term. However, restoring the Lake to healthier levels will take time. Since we can't control the weather, we need to plan for a drier future and continue to take action. Utahns across all sectors are working together to stretch our water supply and become more drought resilient.

Record Investment in Saving Water

As a legislator, I worked to pass legislation to improve how we value and use our water supply. The 2022 legislative session was a record year with about $500 million in appropriations that will yield long-term water savings. We also changed water law to allow water to stay in the system and benefit the environment, including Great Salt Lake. Previously there was no incentive to leave water in the system for the Lake because it was not considered a "beneficial use." Legislation was also passed to set up a $40 million water trust to help facilitate the acquisition of water rights to benefit Great Salt Lake further. This process is underway and is a step in the right direction. All of these actions were a huge effort that required the coordination of the legislative and executive branches.

With the agriculture sector accounting for 65% of water use in the Great Salt Lake watershed, investing in water-saving technologies is critical. I have personally incorporated agricultural optimization technologies like the piping of ditches, drip irrigation systems, minimal tillage, and laser leveling on my farm to improve water efficiency. These improvements have saved thousands of

co-conspirators, photograph courtesy of Nan Seymour

acre-feet of water that can now stay in the system and benefit the wetlands surrounding the Lake and the Lake itself. During this past legislative session, $70 million was appropriated for agricultural optimization. As more farmers implement these water-saving tools, it frees the supply for other uses, including the natural environment.

We have made great strides in metering pressurized secondary irrigation systems, which account for 30% of the State's municipal and industrial water use. The legislature appropriated $250 million to fast-track meter installation. Areas that have installed meters have seen a 20-30% reduction in water use. The ability to measure allows users to better gauge their usage.

The legislature also appropriated $5 million for a statewide turf buyback program, which requires participating cities to adopt water-efficiency standards. Utah is the first state to offer this program, which incentivizes the removal of non-functional grass. Outdoor watering makes up about 60% of Utah's municipal and industrial water use. Removing thirsty grass and encouraging Utahns to transition to water-wise landscapes will shape future water use.

Taking additional action

These efforts are a great start, but we need to do more. We are working with elected officials, state agencies, and other stakeholders to find solutions to protect this critical resource. Years ago, while on a site visit to my ranch, the manager at Farmington Bay noticed phragmites were far less invasive on my property than in other areas around the lake. For decades, cattle had been grazing the wetlands and phragmites on my ranch, helping to keep it under control. The visit triggered additional conversations and eventually an agreement wherein the State now allows cattle to graze on State waterfowl management areas. Phragmites have great nutritional value, and the cattle perform very well grazing on these lands. It's a win-win situation.

In my new role as the Utah Department of Natural Resources executive director, I pledge to look for innovative ideas and work hard to find solutions to the challenges we face: extreme drought, increased demand on our State's natural resources, competing interests for our water supply, and more. These resources play a significant role in the quality of life we enjoy, and it's a legacy I want to leave for generations to come.

Joel Ferry
Executive Director
Utah Department of Natural Resources

photograph courtesy of Joel Ferry

HOW TO REACH US
FRIENDS of Great Salt Lake
150 South 600 East Suite 5D
Salt Lake City, UT 84102
website: www.fogsl.org

Submission Deadlines:
Sept. 16 (Fall)
Dec. 16 (Winter)
Mar. 16 (Spring)
June 16 (Summer)
Submit articles and images for consideration to Lynn de Freitas at ldefreitas@xmission.com

LAKE FACT:
Q: How does the water storage capacity of the Lake at 4,200' compare to the storage capacity today at 4,189'?

A: 15.5 million acre feet - 4,200'
7.1 million acre feet - 4,189'

THANKS FOR MAKING A DIFFERENCE

Memberships and Donations received between
January 25, 2022-November 6, 2022

Linda Aaron
Maren Abercrombie
Cheryl Acton
Lesly Allen
Bruce Anderson
Michael Anderson
Seth Anderson
Grant Archer
Ian Arnold
Genevieve Atwood
Lawrence Baer
Kody & Sarah Baird
Sam Baldridge
Dipanwita Banerjee
Kevin Barker
Byron Barkley & Debbie Kotter
Rob Baskin & Lisa Watts-Baskin
Margie Batson
Bonnie Baxter & Donald Clark
Geoffrey & Diane Bedell
Daniel Bedford
Elizabeth Bernhard
Therese Berry
Siiri Bigalke
Molly Blakowski
Lynn Bohs
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Linda Bonar & John Stratton
Brenda & Gabe Bowen
SaJatah Boyle
Joel & Christine Briscoe
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Yaeko Bryner
Tina Burton
Carrie Buse
Gregory Butler
Alex Butwinski
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Michael & Kristina Christopherson
Hunter Clapsadl
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Making A Difference

How We Do Our Work—Thanks To You

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As a 501(c)(3) nonprofit, FRIENDS of Great Salt Lake relies upon the generosity of our members, individual donations, foundations, and grants. Individual memberships and donations provide the bulk of our funding at approximately 55% of our annual revenue. Foundation donations and corporate grants generate 25%, and government grants generate 20%.

With an annual operating budget of under $300,000, FRIENDS of Great Salt Lake spends a majority of funds on Programming (83%), including our Education Programs, The Doyle Stephens Research Program, Advocacy Programs, and the Alfred Lambourne Arts Program. Fundraising costs average 10%, and administrative expenses 7%.

FRIENDS of Great Salt Lake is a member of Utah Nonprofits Association (UNA). We operate with a Donor Bill of Rights, a Conflict of Interest Policy, a Gift Acceptance Policy, and adhere to UNA's Standards of Ethics. Access our IRS form 990 and our Annual Reports on our website.

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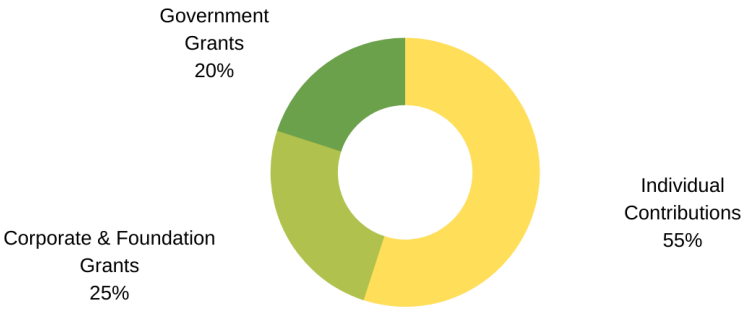
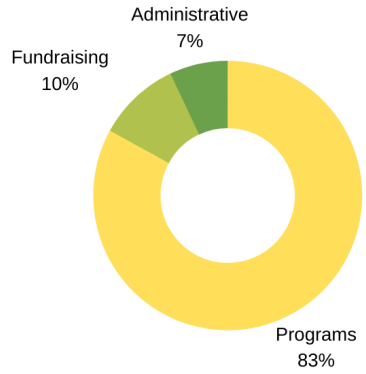


Expenses



Brinkley Harris, Davis High School

Our Great Salt Lake

I love this place, our Great Salt Lake
The mountains they moan, they quake
They seem as if they are watching us
When in the car or on the bus
Each year weather changes form
From snowy, medium to warm
And every morning when I wake
I see this place, our Great Salt Lake
The wind brushes against my face
And then it leaves without a trace
It is a thing I cannot break
This is my home, my Great Salt Lake

Save our lake!

By Sophie Llanos, 9 years old

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Remember, all membership fees and donations are tax-deductible to the extent allowed by law.-

Eared Grebe, photograph courtesy of Max Malmquist/Audubon

Do You Know?

90% of Eared Grebes in North America (3-5 million) come to Great Salt Lake during their fall migration. Each grebe must consume 28,000 brine shrimp per day to survive and migrate.