



# FRIENDS of *Great Salt Lake*

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[www.fogsl.org](http://www.fogsl.org)

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*Welcome Warming Rays* by Charles Uibel

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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.

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# EXECUTIVE DIRECTOR'S MESSAGE

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## THE WRITING ON THE WALL IS VERY CLEAR - NOW IS THE TIME TO COMMIT TO COMPREHENSIVE WATERSHED-BASED RESTORATION AND PROTECTION FOR GREAT SALT LAKE

LAKE ELEVATION ON 11/12/2014 - 4,193.3' ASL

"We need holistic, collaborative and comprehensive water policy to protect our valued resources while facilitating smart growth."  
-Joe Havasi, Director, Natural Resources Compass Minerals

On October 23rd, FRIENDS celebrated 20 years of our collective work to preserve and protect the Great Salt Lake Ecosystem and its future. It was also an opportunity for all of us to renew our commitment as a community to continue this work in honor of an ecosystem that not only encompasses a significant and unique hemispheric value for millions of migratory birds, but is also generous through its extraordinary economic attributes to the people of Utah as a Public Trust.

We live along the shores of something GREAT-  
Great Salt Lake.

And whether we perceive it or not

During its relatively short life 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 affect continues to modify, influence and  
impress our lives

And the lives of millions of migratory birds and  
critters that rely on it.

From our "Call to Binoculars" in 1994, to our "Call for a Conservation Pool for the Lake" in 2010, we've definitely made a difference. We've made tremendous strides forward in building awareness and appreciation of the Lake. We've created valuable tools and shaped important policies to address water quality protection. And we're even getting a better handle on the "balancing act" of resource development while maintaining the ecological integrity of the system.

But we have to do more.

As a terminal lake that lies at the bottom of a 35,000 square mile drainage basin that has a growing population upstream in its watershed, the Lake is a mirror of who we are and how we behave. It's a system that is heavily dependent upon inflows from snowpack, rivers and streams that will either "live or die" unless we make sure that it

has enough water to perpetuate its impressive array of ecosystem services.

That's why we focused our 2010 Great Salt Lake Issues Forum on the topic of establishing a conservation pool for the Lake. Knowing what we know about projected population growth, increased water diversions, water quality, predicted trends in climate change, increased industrialization on the Lake, and the sad fate of many other sister saline systems around the planet, these factors confirm that there is no time to waste. It's a frightening prospect for water buffalos, upstream water rights holders, and even industry to agree that we should accommodate a fixed water elevation for the Lake. An elevation that not only raises all boats but keeps the ecological engine humming. But it's the right thing to do.

To wit -the lowest recorded level on Great Salt Lake since 1850 was 4,191' in 1963. Currently, the Lake level is 4193.3' - a mere 2.3' above the record low. As a consequence, 70% of all boats in the Great Salt Lake Marina at the south shore are landlocked. Gunnison Island, which is a protected island and rookery for the 3rd largest breeding population of American White Pelicans in North America is no longer an island. It has a land bridge for easy predator access to this usually remote location. And Morton Salt has recently filed a request with the Division of Forestry, Fire and State Lands- that oversees jurisdictional management for all sovereign lands including Great Salt Lake- to extend its existing intake canal by 6,800' into the open water of Gilbert Bay, and deepen it by 10'. The Lake level is too low to maintain production of its signature salt and it wants to keep its 150 employees working. The trajectory of this canal would go right through a productive biostrome field which is an integral part of the food web for migratory birds. The list of impacts goes on while more straws are queuing up to make the same request.

How and when will we recognize our reality with Lake level?

A recent study by the US Geological Survey indicated that Utah's average water use is the highest in the nation. For



many years, Utah was second to Nevada but between 2005 – 2010, Nevada decreased its water use and Utah has become number one with a consumption level of 250 gallons of water use/person/day. (Lots of work to do here.) This recognition coupled with the Division of Water Resources' perceived water needs by 2060 to serve a doubling population is driving the legislature, water conservancy districts, and land interests to justify sinking billions of taxpayer dollars into water development projects around the state. One of these projects includes developing the Bear River. When the Division and its consultants presented their vision to the Great Salt Lake Advisory Council at its October 29th meeting, they were somewhat boastful that less than a foot of water that would normally flow into the Lake would be lost. Clearly their sensitivity about the importance of Lake level was lacking.

Although we **can** and **most certainly should** debate the need, the impacts, and the cost of the proposed Bear River Water Development Project, there is **no debate** about the irreparable harm this project will have on the Great Salt Lake Ecosystem.

As you know, the regional economic significance of the Lake to the State of Utah is - \$1.3B annually. As a sovereign land and a public trust resource – **by law** Great Salt Lake must be managed in perpetuity by the Division of Forestry, Fire and State Lands for the people of Utah. Adding to the many challenges the Division has in managing this complex system is the fluctuation in Lake level and how that affects its ecological character and endowment of ecosystem services.

Since the Bear River provides the lion's share (60%) of inflows to the Lake, **there is no question** that this proposed upstream diversion of 220,000 acre feet of water will directly impact Lake levels.

One of the potential reservoir sites is Willard Bay. If this location is selected, it will not only impact the Bear River Migratory Bird Refuge – a national wildlife refuge that was established in 1928 – but will also guarantee a direct loss of unique and valuable habitat of the Willard Spur, that in 2010 the Utah Water Quality Board authorized \$1.2M to fund a 3- year scientific investigation to ensure the long term protection of the Spur's aquatic life uses.

Are we willing to turn Great Salt Lake into an Owens Lake, the Aral Sea or Lake Urmia?

The fate of Great Salt Lake will be decided by our generation. That's why we're putting out another "Call." This

"Call" is for a comprehensive watershed based restoration and protection program for the Lake. We propose that we – **collectively** – make a commitment – **here and now** – to focus our attention on the future of Great Salt Lake and how water fits into that picture. It's time to unite our collective wisdom, our professional expertise and our will to achieve this necessary and timely undertaking for the Lake. We've got the numbers. We've got the know-how. We just have to do it.

In the words of Terry Tempest Williams "The eyes of the future are looking back at us and they are praying for us to see beyond our own time."

Great Salt Lake is our gift to the future. Let's do everything possible to perpetuate its contribution to our culture, our consciousness, and our community.

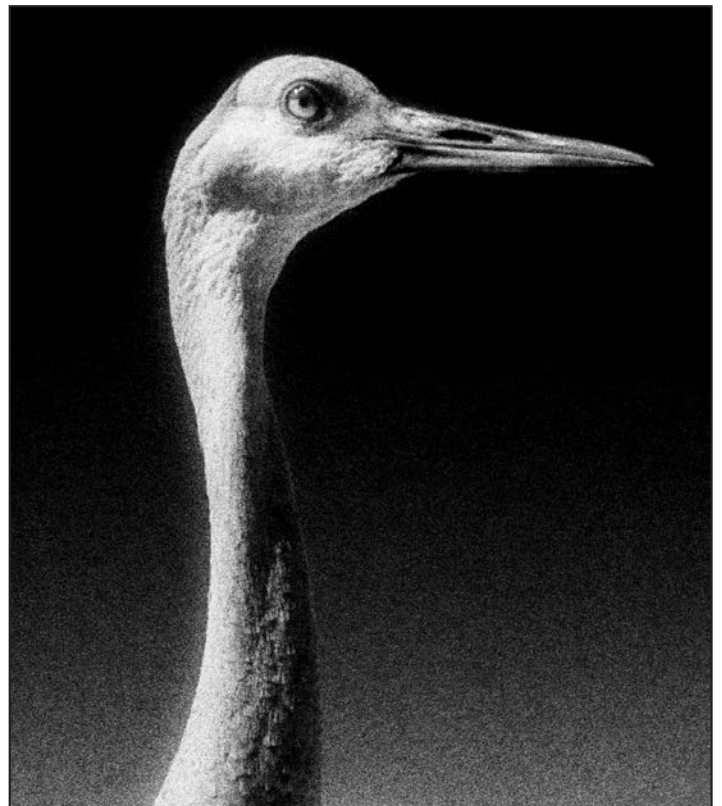
In saline,

Lynn

What you can do:

Stay informed about this issue on our website:  
[www.fogsl.org](http://www.fogsl.org)

And thanks for being there for the Lake.



Sandhill Crane by Rosalie Winard



# FRIENDS ORGANIZATIONAL STATEMENT

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FRIENDS of Great Salt Lake is a membership-based non-profit 501c3 organization founded in 1994. The mission of FRIENDS 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. The long-term vision of FRIENDS is to achieve comprehensive watershed-based restoration and protection for the Great Salt Lake Ecosystem.

FRIENDS has a very active Board of Directors and an Advisory Board consisting of professionals in the scientific, political, literary, education, and broadcast communities. The organization sponsors an array of programs, activities, and materials in pursuit of its mission.

Every two years, FRIENDS hosts the Great Salt Lake Issues Forum to provide a focused discussion about the Lake for policy makers, researchers, planners, industry and other stakeholders. The goal of each Forum is to encourage constructive dialogue about the future of the lake's ecosystem and its resources, and to illuminate the complexities involved in research, management and planning for the lake.

The Friend of the Lake award, given at each forum, acknowledges a citizen, business or organization working to promote Great Salt Lake awareness in the community.

In 1997, Bruce Thompson was hired as Education Director to initiate a regional education project designed to enhance both the knowledge about and care for the future of Great Salt Lake. Bruce wrote and produced a live-narrative slideshow program "The Lake Affect: Living Together Along the

Shores of Something Great." The program is now available on DVD.

In 1998, the Utah Chapter of the Wildlife Society awarded FRIENDS the Conservation Achievement Award..

In 2000, Project SLICE, a 4th grade curriculum using Great Salt Lake as a system of study, was initiated. The Lakeside Learning field trip program, a component of SLICE, continues to grow.

In 2002, the Doyle W. Stephens Scholarship Award was established. The scholarship provides support to undergraduate and graduate students engaged in new or on-going research that focuses on Great Salt Lake.

In 2002, Lynn de Freitas was awarded the outstanding volunteer educator award by the Utah Society for environmental Education.

In 2006, FRIENDS was the recipient of the Calvin K. Sudweeks Award from the Utah Water Quality Board for outstanding contributions in the water quality field.

Kristin Liskowski, hired in 2013 as Membership & Development Director, is working to raise funds and write grants to expand the reach of FRIENDS.

Janessa Edwards, hired in 2014 as Education & Outreach Director, is working to strengthen the Lakeside Learning Field Trip Program and FRIENDS community outreach.

## On the Cover

*Welcome Warming Rays* by Charles Uibel

"A brisk walk on a cold, windy day at Antelope Island. This is the last week of winter. Each time the sun looks at me through the mix of clouds and cold, I get a little hope, and a dose of that affirmation that I am where I should be."

Contact Charles at <http://www.greatsaltlake.photography/>



# CREATIVE EXPRESSION INSPIRED BY OUR INLAND SEA

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*Spiral Jetty, Great Salt Lake* by Susan Kirby  
Submitted for the 2014 First Annual Alfred Lambourne Prize



# RESEARCH AND GREAT SALT LAKE

## UTAH GEOLOGICAL SURVEY LIBRARY COLLECTION HAS USEFUL INFORMATION ABOUT GREAT SALT LAKE

Are you looking for resources and information on Great Salt Lake? The Utah Geological Survey (UGS) Library is a great place to begin or further your research. We have over 200 items in our collection\* that relate specifically to Great Salt Lake. These range from publications such as Wallace Gwynn's classic *Great Salt Lake: an overview of change and the United States Geological Survey's Water and salt balance of Great Salt Lake, Utah*, and simulation of water and salt movement through the causeway, to informational CD's such as *Great Salt Lake brine chemistry databases and reports, 1966-2011*.

In addition, we also have multiple maps such as Bathymetric map of the south part of Great Salt Lake, Utah, 2005 and Great Salt Lake and Newfoundland Evaporation Basin: 1:250,000-scale satellite image map. The Great Salt Lake items in our collection span a broad range of publication dates from historical publications such as G.K. Gilbert's *Lake Bonneville (1890)* and James Talmage's *The Great Salt Lake, past and present (1900)* to Charles Oviatt's *The Gilbert episode in the Great Salt Lake Basin, Utah (2014)*, and we are constantly adding to our collection as new publications come out.

To view a listing of Great Salt Lake publications in our collection, visit our online catalog. Go to the library's website at <http://dnrlibrary.utah.gov/>, click on the Search Catalog box, and enter search term 'Great Salt Lake' (use single quotation marks) to browse all of the items we have specific to Great Salt Lake. Many of the publications are available as PDFs freely downloadable through our library catalog.

If you find that a publication you are interested in is unavailable as a PDF, or if you would simply like to browse the physical collection, you are always welcome to visit us in person. The UGS Library is located in the Department of Natural Resources (DNR) building at 1594 W. North Temple in Salt Lake City.

We welcome visitors of all types and interest levels, and our dedicated librarian is always happy to help you in your research pursuits. The library is generally open weekdays from 8-5, but please schedule an appointment with Librarian Robyn Keeling to ensure that your visit goes smoothly. Robyn Keeling can be contacted by email at [rkeeling@utah.gov](mailto:rkeeling@utah.gov) or by phone at (801) 537-3333. Checkout of library materials is not available to the public, but copies can be made on-site at \$0.10 per page.



Courtesy of UGS Library

For those who are interested in purchasing their own copies of publications related to Great Salt Lake, the Utah Department of Natural Resources Map & Bookstore offers a great selection of publications that are often difficult to obtain anywhere else. Their selection includes most newer UGS publications (and many of the older ones as well), along with a broad range of publications from other authors and organizations.

Check out their online store at [www.mapstore.utah.gov](http://www.mapstore.utah.gov), or drop by in person and see for yourself. In addition to Great Salt Lake items, the store offers a broad selection of topographic, geologic, and road maps, as well as a vast number of books and pamphlets relating to Utah geology, Utah history, and Utah recreation. The DNR Map & Bookstore is located in the lobby of the DNR building and is open weekdays from 8am-5pm.

\*The UGS Library houses a collection of over 14,000 items including topographic and geologic maps, professional journals, professional society publications, theses and dissertations, data CDs and DVDs, and references about Utah's geology.

Robyn Keeling, Librarian  
Utah Geological Survey



## The Swans Return

I heard them everywhere, trumpeting-  
we call it-coins stirred, girls chirping.  
I heard them through marsh ice, through  
rushes, cold and dry, their rusted tassels  
imitating birds flown. We had reason  
to believe they would neber return, winter  
settled good, but swans lifted the warmer sheet  
of weather pulled its ends north toward us both,  
toward the boarders where we live, and now,  
swans spook when I round the corner, spook  
when I open the car door, walk toward them.  
They rise from water like Chinese acrobats  
sudden, graceful in air, longer than the world  
below; their necks stretch toward something new,  
disappearing beyond sight, where they will  
bend bodies above water, silk arabesques, down  
and call. Which voice is theirs, I do not know,  
but this one, this joy, ours wrapped around it,  
singing the earth whole, gives back when we wait,  
when winter falls away and tundra swans return.  
Spring lies down canal waters all afternoon.  
Ice pops. The sun wipes gauze from the clouds  
lights the field of reeds gold that belongs to you,  
swans with their sibilants gliding thaw, and me.

by Joel Long

Joel Long's poems - *The Swans Return*, *Monologue of Fishbone*, and *Lake Flats and Lake* were submitted for the 2014 First Annual Alfred Lambourne Prize. He teaches English and creative writing at Rowland Hall. *The Swans Return* and *Monologue of Fishbone* are forthcoming in the Sugar House Review. His books include *Winged Insects*, White Pine Press, 1999, and *Knowing Time By Light*, Blaine Creek Press, 2010.



Tundra Swans by Rosalie Winard

# WATER DEVELOPMENT PROJECT PUTS LAKE AT RISK

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## PRESUMED WATER DEVELOPMENT NEEDS THREATEN BEAR RIVER MIGRATORY BIRD REFUGE AND GREAT SALT LAKE



Stilts by Gary Crandall

In September, Lake lovers everywhere were shocked to learn the Utah Division of Water Resources had been working to advance proposed diversion of Bear River water. A consultant hired by the agency presented a plan to the Cache County Council summarizing how the proposed water engineering project would divert water from the Bear River upstream of its confluence with Great Salt Lake.

This proposed Bear River water development would greatly impact the entire Great Salt Lake ecosystem because this river is the single largest water surface source for the Lake each year. The Bear River provides nearly 60 percent of the Lake's surface water inflow each year as it feeds the Great Salt Lake in the Bear River Migratory Bird Refuge. The proposed diversion would have grave ramifications for the Lake and its wetlands and cascading impacts upon the millions of birds that depend upon this ecosystem to rest and refuel themselves in their migrations across the globe.

The proposed water development would divert an incredible 220,000 acre-feet of water, comprising roughly 18 - 20 percent of the Bear River's annual flow of water. This diversion would reduce the inflows feeding the Lake, thereby reducing the Lake's elevation and its perimeter. The diversion would thereby reduce the acreage of shoreline wetlands, presumably by thousands if not tens of thousands of acres of wetlands or more. One study from several decades ago estimated Lake levels could be reduced by 2 - 4 feet in elevation. No comprehensive studies have been completed documenting how many acres of wetlands would dry up, much less which specific bird species might be most impacted nor how bird populations would be impacted.

And yet water suppliers from the Jordan Valley Water District and Weber Basin Water District have hired marketing and lobbying firms to make the case to Utahns that we are running out of water and need Bear River development for our future. They have joined with the Division of Water Resources to tell Utah legislators that we need to increase tax funding for this and other water projects.

The supposed purpose of proposed Bear River water development is to provide water for residents in Davis, Weber and Salt Lake Counties. Although population growth in these counties is pointed to as explanation for the need for this water, in truth such claims are unsubstantiated and greatly exaggerated. In fact, the Division of Water Resources is now being audited by the Legislative Auditor General after widespread criticism that these supposed water projections are inflated to make a false case for this and other proposed water projects.

Although the Wasatch Front is growing, numerous inexpensive sources of water are widely believed to be ample enough to provide water for continued population growth, for better or worse. These water sources include better financial incentives in water rates arising from the phasing out of property taxes for water, alongside basic water conservation measures practiced in other western communities that place a stronger value on eliminating water waste. The fact that Wasatch Front residents are among the biggest users of municipal water (per person) in the U.S. is but one indicator that Northern Utah is simply not running out of water.

A third source of water lies right under our noses, the con-



version of farmland water sources that should occur as we pave over our best farmlands with subdivisions. Although paving farmland is a sad byproduct of Utah's growth that has measurable impacts to our quality of life, we should not add insult to injury by ignoring the farm water that often remains flowing in irrigation ditches, right through new subdivisions. Yet Utah often does just that, which explains why the Salt Lake Valley still has over 100,000 acre-feet of agricultural water now diverted in gutters and small canals, even though the county has just a small fraction of the farmlands once serviced by this water.

Unfortunately, many hear that our population is growing and simply assume we must be running out of water. But in truth our municipal population is using a small fraction of Utah's total water use. Between 80 - 85 percent of Utah's annual water use is for agriculture, which is diminishing as a sector. Urban residents use most of their water for grass, and it is used quite wastefully, with some using 150 percent as much water as necessary to maintain these decorations. Hardly cause to lower the Great Salt Lake and dry up tens of thousands of acres of wetlands.

The real purpose of water suppliers' proposed Bear River water development is simply to acquire billions of dollars in spending contracts to dam and divert the Bear River. Some in the water supply community believe that water

development itself is an intrinsic good, and that our rivers and streams are simply water taps that must be developed. Readers finding this concept hard to believe should listen to the audio from the September 18 Natural Resources, Agriculture and Environmental Quality Appropriations Subcommittee meeting, just one legislative committee openly describing this belief.

Current proposed Bear River development would cost \$2 billion and include several reservoirs, treatment plants, and tens of miles of pipes to deliver this water to Wasatch Front communities. The project would likely require increases in water rates, property taxes and impact fees. The total cost of the project with interest and financing could easily exceed \$4 billion, depending upon the length of the amortization window. Seriously – just to overwater grass?

Before any approval of this proposed diversion could occur, a full NEPA process would have to begin, meaning scoping meetings around the Wasatch Front and the preparation of a lengthy Environmental Impact Statement. Such a process will likely take many years and millions of dollars in expense, assuming that federal approval of the project would be received for the project.

Zach Frankel  
Executive Director, Utah Rivers Council



Courtesy of Lynn de Freitas

# AIR POLLUTION IMPACTS OUR ECOLOGICAL RESOURCES

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## WHAT DO GREAT SALT LAKE AND A TITLE V PERMIT HAVE IN COMMON?

The foul air that causes humans to wheeze and cough, attacks our lungs, brain and heart and fosters developmental abnormalities is equally, if not more harmful to wildlife. Like humans, animals can experience a whole host of health problems if they are exposed to sufficient concentrations of air pollution over time. Moreover, air pollutants damage the ecological resources, including water quality, soils and vegetation, on which wildlife relies.

Birds have very high respiratory rates and so are particularly susceptible to air pollutants. In Tehran, crows, nightingales and pigeons fled the city when air pollution levels were high – particularly in the winter. In Singapore, pigeons fell from the sky during a severe air pollution episode. As it does in people, air pollution impairs the respiratory and circulatory systems and organs of birds, causes genetic mutations and threatens reproductive success.

Many insect populations decline in the presence of air pollution. Air pollution interferes with the ability of bees and other insects to follow the scent of flowers to their source, undermining the essential process of pollination. Numerous studies show that the populations of pest insects actually increase when air pollution concentrations are high. Evidence indicates that the natural predators of these pests can be harmed by emissions.

Moreover, insects exposed to air pollution can endanger the birds that feed on them. Songbirds that eat primarily insects are particularly prone to mercury poisoning. Air pollution reduces populations of green caterpillars so that the great tits in Texas that ate them lost their vibrant yellow coloring.

Air pollution also harms plants and water quality. For example, ozone enters plants through leaf openings, damaging foliage and root systems and retarding growth. These impacts are amplified by drought and the presence of other air pollutants, insects or diseases.

Nitrogen compounds introduce unnatural nutrients to surface waters, causing rapid increases in algae growth. Studies show that up to one-third of the nitrogen that pollutes the Chesapeake Bay comes from the air. In addition, nitrogen pollution can also contribute to water bodies becoming more acidic.

Based on these concerns, FRIENDS has joined the community-wide effort to improve air quality along the Wasatch Front. After all, the millions of tons of pollutants emitted

each year threaten the birds, insects, plants and waters of Great Salt Lake.

Most recently, FRIENDS and Utah Physicians for a Health Environment filed a lawsuit asking that the Utah Division of Air Quality be required to issue a “Title V” permit for the Tesoro Salt Lake City refinery. The Director was obligated to take final action Tesoro’s permit application no later than November 1999. Fifteen years later, the Director still has not issued the mandated Title V permit.

The Title V Permit Program, the most important procedural reform in the 1990 Clean Air Act amendments, enjoyed considerable bipartisan support. Through the program, Congress sought to empower citizens, better enabling them to understand the terms and conditions of air quality permits and giving them the means of monitoring and enforcing those conditions.

To this end, Title V requires big polluters to have operating permits. These permits bring together in a single document all the air quality requirements that apply to the source, including emission limitations and monitoring and reporting mandates. With all relevant requirements spelled out in one place, it is easier to know what rules apply and whether those rules are being satisfied. Thus, those most affected by polluters are better able to understand what measures were in place to protect them, their families and their communities.

Under Title V, a big polluter must also file periodic reports explaining whether it has complied with its permit. This transparent approach enhances the ability of the public, as well as state and federal regulators, to determine the extent to which the source is meeting its legal obligations and doing its part to protect health and the environment.

Title V also requires large industrial polluters to meet robust monitoring and reporting conditions. Previously, permits contained only sketchy requirements and it was unclear whether a big polluter was complying with its emission limits. As a result of Title V, the Clean Air Act is easier to enforce.

Finally, the Title V program introduces an additional layer of oversight. The U.S. Environmental Protection agency has the opportunity to object to the issuance of the permit, while the public has the right to petition EPA reject a proposed permit.



FRIENDS and Utah Physicians determined that their members and the environment are entitled to the legal protections and requirements of the Title V program. The air pollution crisis facing the citizens and wildlife of the Wasatch Front is so severe that no measures that help reduce emissions may be overlooked. Therefore, the organizations have

taken their case to the Utah courts to seek enforcement of the law after the government's 15-year delay.

Joro Walker, Senior Attorney  
Utah Office Director *Western Resource Advocates*



Egg Island by Rosalie Winard

# GREAT SALT LAKE EDUCATION

## GET “INSPIDERED” ON ANTELOPE ISLAND

Imagine Antelope Island covered with thousands of spider webs. If you have been out to the island in August, you wouldn't have to imagine it, because you would see webs large and conspicuous all around. To celebrate the amazing spiders of Antelope Island, FRIENDS of Great Salt Lake joined staff from Antelope Island, students and staff from Westminster College Great Salt Lake Institute, and faculty from Weber State, to host the third annual Spider Fest on Saturday, August 9, 2014. We wanted to let people get up close and personal with these eight-legged creatures, to provide information about their island habitat, and inform them of the important role they play in the island ecosystem.

Cautious, curious, or exuberant, visitors came out to see one of the most numerous and least understood creatures of the island; spiders! On any summer day on the island, spiders can be seen from almost every conceivable vantage point. They are found on plants, and buildings, and the underside of bridges – any place is suitable if they can make three points of contact. From those three points the spiders begin to spin their intricate webs. Orb weavers are not aggressive, seldom bite, and are harmless to humans. They can grow up to an inch in body length with a rounded abdomen. But, they are so numerous and get so large that some people experience a bit of trepidation just walking from the parking lot to the visitor center!

Although the island is host to many species of spiders, the month of August seems to be a prime month for the orb weavers. It seems a bit odd to call a spider gorgeous, but the design and colors on their abdomen are astonishing! The Banded Argiope we saw had pale legs with brown bands and crazy shaped white and brown splotches on its abdomen. They build orb, or circular shaped webs that can be several feet in diameter. The orb weaver typically sits in the middle

of the web, face down, waiting for a tasty meal. Brine flies and other insects, such as grasshoppers, are their main food of choice. And, in turn, they are a primary food source for many of the island's birds. The loggerhead shrike, a year-around island resident, absolutely loves to feast on spiders.

I was surprised to hear so many spider stories. Everyone seemed to have one. Some visitors shared a 'big spider' story, while others shared their 'spider in my house' story. I loved them all, adding a few of my own. Two seven-year old cousins brought their grandpa out to the island, specifically for the Spider Fest. They climbed over every bolder, looked into every nook, and found dozens and dozens of spiders. It was their sharp eyes that first spotted the long-jawed spider. They were so excited about their discovery, we asked them to be the “leaders” for visitors who wanted to see their spider.

In back of the visitor center there were so many spiders on a single bush that I called it a Christmas bush, imagining the spiders like ornaments. A young girl who thought the name Halloween bush was more appropriate quickly overrode that name; they were spiders, after all. While walking up the pathway to show another young visitor a black widow spider, he told me he had a spider at home and that he brought it with him. He quickly reached into his pocket, and, with a huge grin, produced a resin-encased tarantula!

Spiders elicit various reactions from people, but, like most of nature's marvels, the more one learns about their life-cycle, and the important role they play in the ecosystem, the greater appreciation one has for them. And, it is quite a glorious web the spiders of Antelope Island weave! If you missed this year's festival, don't worry – we will be back! We will host the fourth annual Spider Festival on Saturday, August 8th 2015, and we hope to see you there.



Spider themed crafts were a highlight by Margie Nash

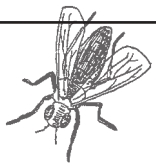


# GREAT SALT LAKE AT A GLANCE

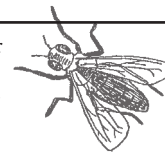


Courtesy USGS





E•phy'•dra, a noun; a genus of two species of brine flies that live on the bottom of the Great Salt Lake as larvae and pupae, and along the shores of the Lake as adults.



## US MAGNESIUM'S LISTING AS A SUPERFUND SITE AND THE WORK AHEAD

US Magnesium sits on the South West shore of the Great Salt Lake in Tooele County. Since 1972 the facility has harvested brine from the Great Salt Lake to produce magnesium, alloy magnesium, and chlorine. As with most extractive industries, there is a lot of waste that can be toxic for humans, animals and ecosystems. The way waste is disposed and stored affects more than just the production facility and has a far-reaching impact.

Citizens have kept their eyes on the magnesium production facility for years. Known in the 90's as Magcorp, the facility had a reputation for being the nation's worst air polluter for two years in a row. Citizens Against Chlorine Contamination (CACC) was formed as an aggregate of several interested community groups including the Sierra Club and FRIENDS of Great Salt Lake. In July of 1996, they met with Utah's Air Quality Board and raised concerns about the role of Magcorp's emissions on Salt Lake City's air quality. After a federal lawsuit against Magcorp, they filed for bankruptcy protection. The owners of the facility re-tooled and reduced emissions and then renamed and rebranded as US Magnesium in 2002.

In the fall of 2008 the Environmental Protection Agency (EPA), with support from the Utah Department of Environmental Quality (UDEQ), proposed listing the US Magnesium facility and its surrounding areas of waste disposal as a national priority for clean up. The National Priorities Listing (NPL) and the subsequent Superfund process for cleaning up a polluted site can take many years. Because of the facility's close proximity to Great Salt Lake, FRIENDS and its members have paid close attention to developments at the site. Now, with support from the EPA, FRIENDS is hiring a Technical Advisor to assist with communicating the technical details of the cleanup and the complex processes to our community and stakeholders. With a Technical Advisor, the community can also participate in the decision-making process.

The US Magnesium superfund clean up process has wide-reaching impact. Lake levels, while currently low, have dramatic historic fluctuations and surface water migration pathways may exist. Groundwater migration pathways may exist, with plumes that could impact local drinking water as well as the Great Salt Lake. Bird and wildlife activity have also been documented at the facility near the highly acidic

wastewater ponds that have pH levels resembling battery acid. There are also significant concerns for soils and sediments in the area. And in Salt Lake City, air-shed issues remain a perennial concern. Finally, there are considerable health risks for facility workers with exposure.

So, what kinds of toxins are we talking about? The list is long and it includes: Polychlorinated Biphenyls, chlorine, arsenic, hydrogen chloride, hexachlorobenzene, chlorodibenzofurans (CDFs), chlorinated dibenzo-p-dioxins (CDDs), and polycyclic aromatic hydrocarbons (PAHs). Most of these toxins do not break down in the environment very easily and may remain in place for long periods of time. Additionally, some may travel long distances by air, significantly impacting our airshed. And once in water, some settle in bottom sediments, attach to organic particles or are taken up by organisms that live in the water.

To date, the Superfund process is still in the early phases. After being listed on the NPL, the EPA began their Remedial Investigation and Feasibility Study to provide opportunities for community involvement, to determine the boundaries and extent of contamination, to assess technologies for measurement and treatment, and finally, to evaluate the costs for clean up. This part of the process, already a few years old, could still take several years to complete.



Aerial view of US Magnesium courtesy EPA



FRIENDS is currently piecing together a communication plan designed to keep you informed of the process. You can stay up to date on information on our website and look for announcements of community meetings.

Stay tuned.

#### EPA Superfund Clean-up TIMELINE:

Preliminary assessment and Site Investigation > National Priorities Listing Process (NPL) > Remedial Investigation and Feasibility Study (CURRENT) > Record of Decision > Remedial Design and Remedial Action > Construction Completion > Post-Construction Completion > Deletion from the National Priorities Listing > Reuse

For more information visit the EPA website at: [www2.epa.gov/region8/us-magnesium](http://www2.epa.gov/region8/us-magnesium)

Katie Pearce,  
FRIENDS of Great Salt Lake Board of Directors



US Magnesium facility site courtesy of EPA

# DISCOVERING OUR LAKE

## UNDERSTANDING HEMISPHERIC CONNECTIVITY BY FOLLOWING GREAT SALT LAKE AVOCETS



Jeff Cowlshaw (Weber State) and John Cavitt place a satellite transmitter on an American Avocet  
courtesy of Javier Paniagua

Over the last several months I've developed a morning ritual that is somewhat unusual. Rather than read the morning paper or check emails, I first fire up my old laptop and log on to the Argos Satellite Network. After a quick entry of my username and password, I download the current locations of eight different American Avocets captured at Great Salt Lake.

This past year, Rio Tinto – Kennecott and the Jordan River/Farmington Bay Water Quality Council provided funding to the Utah Linking Communities, Wetlands and Migratory Birds program and Weber State University to place solar-powered satellite transmitters on the backs of avocets to better understand their use of Great Salt Lake and their migration ecology. Two Weber State University students and a research exchange student from the University of Nayarit in Tepic, Mexico worked with me to capture and tag five females and three males at Great Salt Lake. Additional transmitters will be placed on avocets this winter in Mexico.

Despite only a few short months of data, we're already learning a great deal about how avocets use Great Salt Lake and the start of their fall migration.

Transmitters were placed on breeding birds from the Bear River Migratory Bird Refuge, Farmington Bay Waterfowl Management Area and the Gillmor Audubon Sanctuary. Following nesting in August, each bird, despite where they nested, moved into the same area of the lake at Farmington Bay. August is the time when avocets begin their fall or pre-basic molt and presumably Farmington Bay is the place to be when the time comes.

Early October revealed that two birds left the lake and are now happily transmitting signals in the Gulf of California. One of the birds is located 600 miles southwest at the mouth of the Colorado River in Mexico. It just so happens that this location, the Estero Rio Colorado, is classified as a site of "International Importance" by the Western Hemisphere Shorebird Reserve Network (WHSRN). The WHSRN program's mission is to identify and conserve key locations for shorebirds throughout the Western Hemisphere. Remarkably, this male avocet nested in a WHSRN site of "Hemispherical Importance" at Great Salt Lake and is now presumably resting and foraging at another WHSRN site in Mexico.

The second avocet is a female who is now located south of Puerto Peñasco in Sonora Mexico. Her last signal from Great Salt Lake came just before midnight on October 2. Fifty two hours later we received a signal from her in Mexico over 720 miles away. Because the transmitters only send out signals to satellites for five hours, followed by a 20 hour off-cycle, we don't know her exact time of departure. However, for birds that can travel 30-50 miles per hour, a 700 mile flight could be accomplished in as little as 14 hours. She continues to slowly move south along the coast of Mexico, perhaps heading for another WHSRN site in Nayarit, Mexico.

Unfortunately, we've had set-backs along the way. Two weeks ago I began noticing that one of our female avocets had settled at the south end of Great Salt Lake. Each transmitter is equipped with an activity sensor that allows me to determine if the bird is moving. After checking the data, it was apparent that the bird had either died or the transmitter had fallen off. I mapped the last coordinates we received to see if a recovery mission was possible.





American Avocet with satellite transmitter attached courtesy of Javier Paniagua

The location appeared to be within evaporation ponds that lie along I-80 on the south side of the lake. When we arrived at the site and began scouring the area, I kept thinking to myself that it would literally take a miracle to find a small 8 gram transmitter in such a large area. However, at the cost of \$3,000 each, I was ready to spend as long as it took.

Whether it was divine influence or plain dumb luck, I don't quite know but after only 20 minutes a small reflection caught my attention. Luckily, the transmitter had fallen off our bird and landed so that the solar panel was tilted to the southern sky, allowing for the battery to fully charge and send high quality signals to Argos. After examining the transmitter and harness, it appears that the Teflon strap had been worn by one of the metal loops on the transmitter. The transmitter is otherwise undamaged and we'll be able to deploy it again on another bird with modifications to the harness.

The Great Salt Lake is well-known as a critical site for American Avocets. Over 200,000 individuals, roughly half the world's population, are known to use the lake for staging during migration. Data from this project will allow us to better understand avocet use of the lake and hopefully guide future management decisions.

We are optimistic that additional data will also provide key information on avocet migration ecology and use of wintering sites.

Unfortunately, wetland loss and degradation continue to occur throughout the Western Hemisphere. The identification of sites important to avocets during all portions of their annual cycle, will allow us to be proactive in conserving im

portant locations before they are lost or degraded.

A website was created that reports on the results of this project and the movements of avocets (<http://departments.weber.edu/avianecologylab/AMAV/home.html>).

The life of each transmitter battery is estimated between 2-3 years, so I guess my new morning ritual is here to stay for a while.

Dr. John Cavitt, Director of the Office of Undergraduate Research Weber State University



Javier Paniagua (University of Nayarit) and John Cavitt with an American Avocet courtesy of Josh Hall



## FRIENDS of Great Salt Lake

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Submission Deadlines: Sept. 16 (Fall), Dec. 16 (Winter), Mar. 16 (Spring), June 16 (Summer). Submit articles and images for consideration to Lynn de Freitas, [ldefreitas@earthlink.net](mailto:ldefreitas@earthlink.net), or call 801-583-5593



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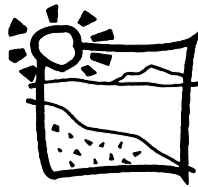
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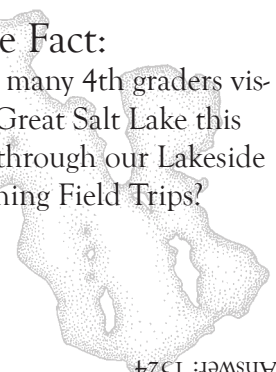
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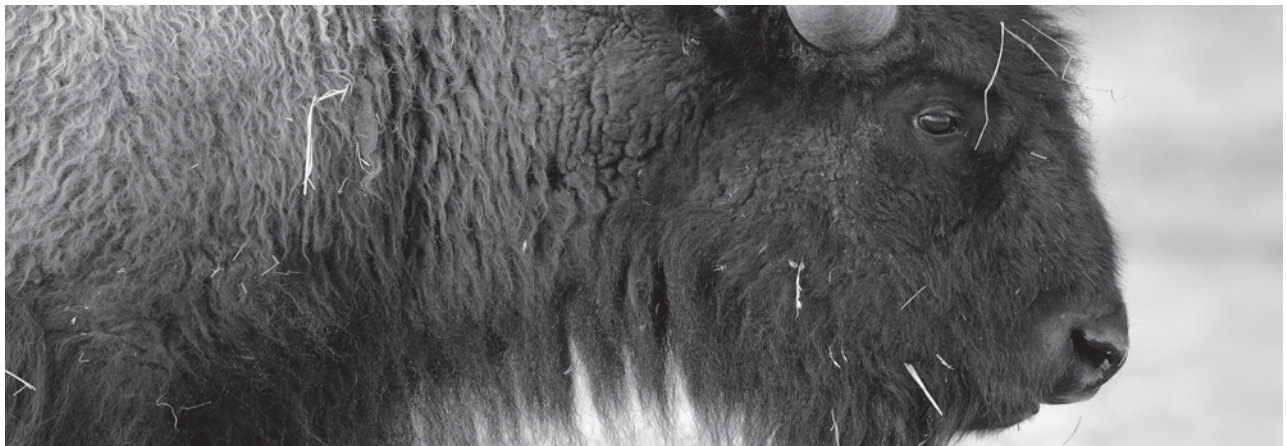
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## Lake Fact:

How many 4th graders visited Great Salt Lake this year through our Lakeside Learning Field Trips?



Answer: 1324



American Bison, Antelope Island, 2008 by Kimberly Anderson





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