

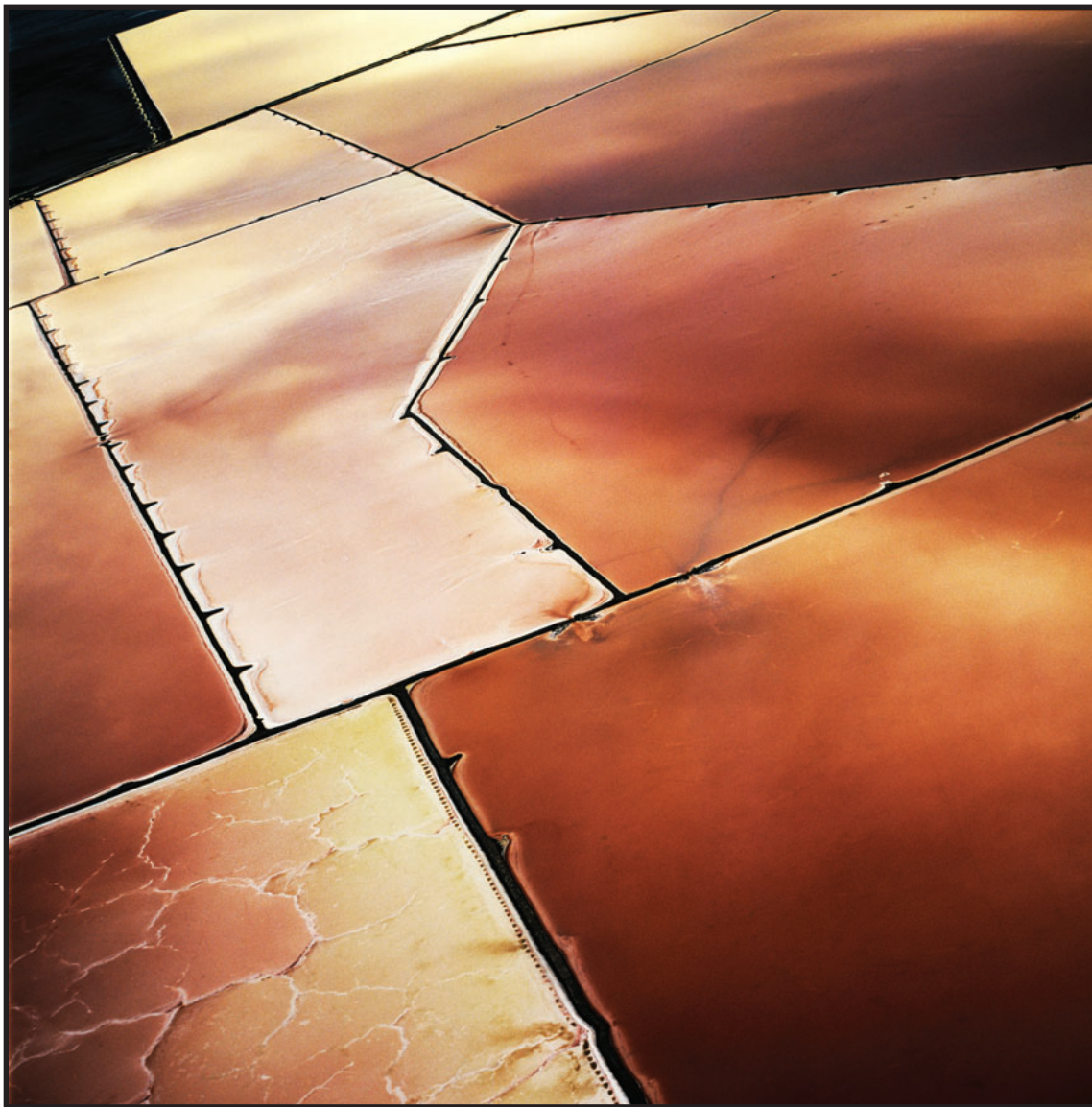
FRIENDS of *Great Salt Lake*

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Terminal Mirage # 236-5 by David Maisel ©2003

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, and advocacy.

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EXECUTIVE DIRECTOR'S MESSAGE

GREAT SALT LAKE MANAGEMENT

– ARE TOO MANY COOKS SPOILING THE BROTH?

*"We must reaffirm the economic value of good stewardship and good work.
For that we will need better accounting than we have had so far."*

Wendell Berry, *The Way of Ignorance and other Essays*

The timing was perfect and the cause was just. On August 25th, at the Antelope Island Visitor Center, Governor Jon Huntsman Jr. signed an executive order to create a Great Salt Lake Advisory Council. The purpose of the council is to review and evaluate existing management and protection of Great Salt Lake. The council is also charged with developing a vision for the future of the lake, and with recommending a management structure which will support the viability of the lake's ecosystem, while achieving a masterful balancing act between the ecological, economic, recreational and private property interests – all by the end of this year. The council consists of 12 stakeholders from business, conservation, academia and municipal interests from the 5 counties that surround the lake. FRIENDS serves on the council.

The governor certainly deserves to be commended for taking the initiative to begin a process which gives all of us an opportunity to reflect on our collective wisdom and responsibility of looking after the lake. There are tremendous pressures the lake faces every day from development on and around it, diverting water for the growing population, water quality issues that include the highest mercury levels ever recorded in the nation, and climate change which will probably affect snow pack and precipitation. Recognizing these pressures, it is fair to say that the entire ecosystem is at risk of death by a thousand cuts. So his initiative is both visionary and necessary.

The council will begin to identify where the gaps are, what is and isn't working, what needs improvement, and is it time to shift the paradigm? To do this effectively, the council must review the convoluted history and current state of affairs of planning and management jurisdictions on both the state and federal levels. This should help the council avoid reinventing wheels that have already proven to be ineffective in addressing the needs of the lake. And with any luck, the council will have the insight and courage to advance the principles

of restoration and protection of a system for which time is running out.

For example, at the state level, from 1975-1979, there was a Division of Great Salt Lake within the Department of Natural Resources. And in 1988, the first Great Salt Lake Advisory Council was created through legislative action. The role of this council was to advise the Board of the Division of State Lands and Forestry (now called Division of Forestry, Fire and State Lands), which was and still is designated as manager or "landlord" of the lakebed. It is just one of seven divisions within the Department of Natural Resources, all of which contribute in some way to making decisions about the lake. Unfortunately, this situation has only perpetuated an environment of conflicting management decisions that creates a tug of war between protection and development. The adage of too many cooks spoiling the broth comes to mind.

In principle and by statute, lakebed leasing and development is based on an interpretation of the Public Trust Doctrine. The trust includes the lands, waters and living resources of sovereign lands, which for Great Salt Lake are those lands which were navigable and under water at the time of statehood. The interpretation promotes multiple uses of these trust resources, without any clear understanding of the past and present cumulative impacts this multiple use philosophy is having on the system. Ironically, it also limits the scope of managing the lake to the meander line. The meander line is an elevation that was established in 1850, which even today is being disputed by private property owners that live around the lake. By limiting management decisions to the meander line, the state essentially keeps one eye covered in failing to acknowledge activities upstream that influence this terminal lake.

Another state contributor to the management dynamic of Great Salt Lake is the Department of Environmental

Quality. DEQ consists of four divisions with a range of responsibilities that includes identifying the beneficial uses of the lake for humans and wildlife, and setting water quality standards to determine the maximum amount of pollutants the lake can carry without impairing its beneficial uses. The bottom line here is that one department (DNR) is overseeing the lakebed, while the other department (DEQ) is overseeing its vital juices.

The state also has jurisdictional responsibility for this unique ecosystem, hemispherically important for millions of migratory birds and wildlife. In 1928, the Bear River National Wildlife Refuge was established and in 1991 Great Salt Lake was designated a Western Hemispheric Shorebird Reserve Site. It is an important breeding, resting and feeding habitat for some of the western hemisphere's largest populations of migrating shorebirds and waterfowl. Great Salt Lake is one of only five such sites in the lower 48 states.

At the federal level, the US Army Corps of Engineers, the US Environmental Protection Agency, and the US Fish and Wildlife Service all have some form of jurisdiction. These entities work together to administer Section 404 of the Clean Water Act (1972), to protect migratory birds and threatened and endangered species. The Department of Defense, Bureau of Reclamation, and the Bureau of Land Management also influence land use and water storage on and adjacent to the lake.

All around the world, saline systems like Great Salt Lake are facing similar pressures. They provide unique habitats for birds and wildlife and resources for populations living near them. And they provide an array of unique ecosystem services, which in most cases have yet to be determined. It's clear that the Great Salt Lake Advisory Council has its work cut out for it.

But for the moment, let's go back to the future and revisit one of the many management decisions currently on the state's plate – oil and gas development in Gunnison Bay (See FRIENDS Fall 2007/Winter 2008 issue for more details). Gunnison Bay is home to Gunnison Island, a protected island on which the 3rd largest breeding population of American White Pelicans in North America finds refuge. And it is home to Robert Smithson's Spiral Jetty, one of the most significant earthworks of the 20th century. This particular issue might well have been the stimulus for the governor's executive order.

After the “landlords of the lakebed” opened up for public offering, nearly 175,000 acres for oil and gas development, one of the active lease holders, Pearl Montana Exploration, Ltd, applied for a permit to drill exploratory wells within 5 miles of Spiral Jetty. The state received the application in January 2008, and it was earmarked for quick turn around. While under review by the Resource Development Coordinating Committee (RDCC), and near the end of a public comment period, the state was flooded with emails and phone calls from around the world protesting the application out of concern for Spiral Jetty and the fragile ecosystem of the lake.

In early August, after the Utah Division of Oil, Gas and Mining (UDOGM) made multiple requests for Pearl Montana to complete its application by providing answers to numerous questions and further details about the exploration and potential development, the application was denied. Perhaps the extent of the public comment was a key factor in getting the attention of decision makers, including the governor, and provided the catalyst to slow down what might have otherwise been an “expedited” application process.

Subsequently, on September 18th, representatives from Pearl Montana met with UDOGM. At the meeting, they indicated that personnel changes have occurred in the company, and that they do intend to re-apply for permits to drill. Pearl Montana is also scheduled to present to the Great Salt Lake Technical Team at its November 5th meeting. It's probably just a matter of time before this development is permitted to go forward. Unfortunately for Great Salt Lake, the luxury of time is not an option.

The future of Great Salt Lake is now. FRIENDS and the conservation community believe that fundamental changes are necessary in the way we manage and care for this hemispherically important ecosystem. The lake needs a comprehensive vision for its long term sustainability and the political will to carry it out. 🐾

In saline,

Lynn de Freitas

FRIENDS ORGANIZATIONAL STATEMENT

FRIENDS of Great Salt Lake was 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, and advocacy. 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 GSL awareness in the community.

In 1997, Bruce Thompson was hired as Education Director to initiate a major 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 2000, Project SLICE, a 4th grade curriculum using Great Salt Lake as a system of study was initiated. It consists of 7 units of study, a Speakers Network, Teacher Training Workshop, and Lakeside Learning Field Trips. Currently work is being done to expand the curriculum into other grades.

In 2005, FRIENDS hired Katie Pearce as Assistant Director, who is working to refine the Project SLICE curriculum and expand education outreach into the Great Salt Lake community.

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

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

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

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

On the Cover

Terminal Mirage # 236-5 by David Maisel, 2003

For the past twenty years, I have been making aerial photographs of environmentally impacted landscapes in a series called Black Maps. These images have as their subject matter the undoing of the natural world by the wide-scaled human intervention on the landscape.

The most recent chapter of this work is Terminal Mirage; inspired by Robert Smithson's apocalyptic writings on the Great Salt Lake. Thus far, at the project's outset, I have photographed at Smithson's Spiral Jetty, both from the air and on the ground. I have also made aerial images at the Tooele Army Depot, where 900 munitions storage igloos sprawl across the valley floor, and at the site of evaporation ponds covering some 150,000 acres along the shores of Great Salt Lake.

David Maisel – www.davidmaisel.com





Burrowing Owl by Elizabeth Dewitte

OUR MEMBERSHIP PARTY WAS A GREAT SUCCESS THANKS TO YOU!

We appreciate the generous support of our members, sponsors and donors of silent auction items for an absolutely salty evening of good food, good friends and good fun.

Your thoughtful donations are already working on our programs to advance the preservation and protection of our Great Salt Lake.

October 2 Membership Event Sponsors / Donors for Silent Auction

Avenues Jazz Trio
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Underfoot Floors
Utah Jazz
Wasatch Touring
Rosalie Winard
Zion Canyon Institute

SCIENCE AT WORK

THE GREAT SALT LAKE ECOSYSTEM PROGRAM



Bird Counts by Airboat by J. Butler

Great Salt Lake. These three words conjure a different image for everybody who has the fortune to experience its salty shores. I was immediately captured by the lake at a young age beginning with a visit to the south shores of the lake near Black Rock. The water was lapping just inches away from I-80 during those years of high water in the 1980s. Saltair looked as if it might float out to sea to become the great dance hall of the grebes. Black Rock was barely noticeable with just the very top peaking out of the surf. I so vividly imagined the lake opening up to consume the entire Salt Lake Valley in one large wet gulp. As an aquatics biologist for the Great Salt Lake Ecosystem Program I have the fortune to experience the lake not only for pleasure but also for work.

The Great Salt Lake Ecosystem Program (GSLEP) was founded in 1996 by the Utah Division of Wildlife Resources amid concerns that excessive commercial harvesting of brine shrimp cysts would crash the fishery. There were also concerns of what effect harvesting had on the brine shrimp population as they relate to migratory birds as a food resource. Cysts (encapsulated brine shrimp embryos) produced at Great Salt Lake had established a reputation of being very desirable in commercial aquaculture production in terms of quality and quantity thereby increasing the pressure placed upon the resource. It became apparent to the brine shrimp harvesting community, conservationists and the Utah Division of Wildlife Resources (UDWR) that greater oversight of the harvest was needed. Managers quickly realized that despite its

large size and proximity to a major metropolitan area there was scant knowledge about the basic functioning of the Great Salt Lake ecosystem. The lack of basic research on saline lakes in general made answering management questions impossible!

Thus began the Great Salt Lake Ecosystem Program. For over 12 years GSLEP biologists, contracted researchers and cooperators have been systematically monitoring and researching the aquatic and avian communities of the lake. Aquatics biologists travel over 100 miles per trip in a boat to collect numerous samples of brine shrimp and phytoplankton for monitoring trends in populations. In addition, we measure water temperature, salinity, oxygen concentrations, turbidity estimates and other information from established sampling sites all over the lake. Samples are then brought to the lab where each is painstakingly analyzed. GSLEP avian biologists spend their time on ATVs, airboats, airplanes and on foot to monitor the avian populations of our hemispherically important lake. It is not uncommon for biologists to see tens and even hundreds of thousands of birds in a single day. A hugely successful monitoring program staffed largely by volunteers was implemented in which large areas around the lake were monitored for many years. Equipped with the knowledge gained during that time we were able to refine the monitoring program that continues even today.

Research and monitoring activities gave managers additional tools with which to conserve the resources of Great Salt Lake. For example, measuring trends in the brine shrimp population and cyst mortality made it possible to model the minimum number of brine shrimp cysts necessary to repopulate the lake in the spring following the frigid winter months when adult brine shrimp cannot survive. According to this modeled management strategy the harvest season is closed when cyst densities drop to 21 cysts per liter of lake water. This strategy was necessary to maintain the brine shrimp population and sustain the bird community that feed on them.

Work on waterfowl that overwinter on Great Salt Lake, particularly Common Goldeneye, further illustrate the utility of lake research and monitoring. Researchers estimated at least 45,000 goldeneye overwinter at the lake, far exceeding most expectations or reported populations in the western U.S. During the goldeneye's winter hiatus, mercury concentrations would increase to



Aerial Verification of the Brine Shrimp Harvest

by L. de Freitas

levels among or exceeding concentrations previously reported. Not only were consumption advisories issued for Common Goldeneye, Cinnamon Teal and Northern Shovelers but it also spurred further research into the transfer of mercury through trophic levels in Great Salt Lake.

Entire manuscripts could be written on any number of topics touched upon in this brief narrative. However, the information presented here illustrates how management and research provide direction for conserving the resources of Great Salt Lake and the numerous organizations and people that participate and cooperate in this endeavor. University researchers and graduate students, brine shrimp harvesting companies, various state and federal agencies, and conservationists all contribute their expertise to the Great Salt Lake ecosystem. The Great Salt Lake Ecosystem Program is one of the many major contributors to the ever increasing knowledge we have of Great Salt Lake. 🐾

Jaimi Butler is a wildlife biologist for the Great Salt Lake Ecosystem Program

SPIRAL WEDDING 2004

SPIRAL JETTY AND THE FEDERICO FELLINI EFFECT



Spiral Jetty Viewshed by Charles Uibel

We never even visited Spiral Jetty until the day of our wedding. The evening before, a friend showed me photos of her visit. The pictures, taken a few months earlier, showed her wearing Teva sandals sloshing around in salty puddles. I thought, “this is the stupidest idea I’ve ever had.” I imagined the brine flies and the smell, which didn’t seem so enchanting in the context of a wedding.

I’d moved to Utah in 1980 and left in 1996. Spiral Jetty was under water the entire time I lived there. I’d kept a sailboat at the Great Salt Lake marina and had loved sailing and hiking on its enchanting islands. I loved the vast sky, the pelicans, the quiet, the loneliness. I even loved the brine flies and the smell and the thick salty water. I was hooked. Still, I never heard a word about Spiral Jetty.

Mark proposed to me in the weekly newspaper, in Port Townsend, where we live. He put the ad in on my birthday. Friends saw the small ad before I did and congratulated me. I didn’t know what they were talking about.

A few months later, I read in *Sculpture* magazine that the International Sculpture Center was teaming up with the Salt Lake Art Center to run a field trip out to the Spiral Jetty. When I saw that the trip was scheduled for my birthday, I said, “this is what I want for my present.” Mark said, “while we’re out there, why don’t we get married?” “What a great idea,” I said. I was wondering how far into the wilderness we could get to be married because I hate weddings and wanted only my closest friends present, in casual clothes, and only if it was cheap and easy for them to be there. Mark and I were confused for some time whose idea



it was to be married on the Spiral Jetty because he actually meant “while we’re in Utah, why don’t we get married?” knowing that I have strong ties in Utah.

Artist Robert Smithson had designed the Jetty in 1970 and hired road builder Grant Busenbark to build a 1,500 foot long black basalt rock swirling wharf at the far northern end of the Great Salt Lake. Smithson died in a plane crash, Spiral Jetty became engulfed in rising lake water, and this great earthen sculpture went into history as a drowned masterpiece. In 2000, when the lake water became low enough for the Jetty to emerge, it was big news in the art world.

On the day of the wedding we went out to the Jetty in one of the Sculpture-Art Center’s vans. Everyone in our van seemed excited when they heard we were getting married there. When we arrived, we found that, rather than being awash in salt water, a thick coat of slightly pink salt surrounded the Jetty and reached out for maybe half a mile to form a new lake edge. You could walk on the crusty salt as if it were a sheet of ice. It looked like frozen water except for the slight pink shade, attributed to halophytic bacteria that thrive in the hypersaline environment.

After the tour, the people got into the vans and drove away. Mark and I stayed behind alone and waited for our friends.

And waited. And waited.

Our friends were supposed to be bringing my children, the wedding clothes, the flowers, the bouquet, the mead wine, the white cups, the dried rose petals, the photographer, the newly ordained minister and the other witnesses, plus a couple of tag-along dogs. But they weren’t there.

We sat under a small purple umbrella wondering what was keeping them. The recent rains meant that the hills were resplendent with Black Eyed Susans. It was very quiet. Other than the umbrella, there was no shade and, of course, no fresh water or bathroom.

Finally they all arrived -- my daughter had a nosebleed on the way and this distracted them so they missed the free-way exit – and suddenly we were all actors in an Italian Federico Fellini film. We dressed in our wedding clothes under the bright desert light. We set up lawn chairs and pinned cream-colored rose corsages and boutonnieres on Bonnie the minister, on Mark, and on my children, Ruby and Adin.

Mark and I walked the full length of Jetty as if we were



Spiral Wedding Ceremony

Druids and time seemed infinitely circular. At the end of the Jetty we stepped off. There was a perfect circle of white within which to perform the ceremony, surrounded by the black rock jetty under a huge, still, blue sky.

Afterwards, there were mead wine toasts and we gave everyone a small rainbow-colored kite to fly.

The next day Mark and I were in Salt Lake City and the wind blew so hard that the sky was deep brown with dust. Another Sculpture-Art Center trip went out to the Spiral Jetty. The lake water had blown into a stream that penetrated the salty crust around the Jetty. It was entirely changed from just one day to the next.

What an amazing presence this Great Salt Lake has been for me in my life! I thank the Great Spirit that lives there so forcefully one could see it, breath it, hear it, taste it, touch it, if you just stand still for a few moments. It really is there. 🌵

Sarah Ohman is a graduate of the University of Utah and Westminster College. She and her husband, Mark Stevenson are sculptors who live on the Olympic Peninsula in Washington State.

MORE THAN MEETS THE EYE

GREAT SALT LAKE IS A PLACE OF PHENOMENA

The salt water of the Mediterranean Sea, and the Pacific and Atlantic Oceans, where I played as a child, have long been places that have defined my connection to life and the world around me. Later years brought my attention to the delicate rhythms of fresh water streams and lakes in the Rocky and Sierra Nevada Mountains, along with the unusual buoyancy of the Sierra's Mono Lake.

In 2004, I made my first visit to the Great Salt Lake to see the environmental art work, Spiral Jetty. Anyone who has visited the Great Salt Lake and observed what seem to be floating islands, sat on water or walked over what looks like ice on a lake in summer, knows that the Great Salt Lake is a place of phenomena.

I had recently visited the Los Angeles Museum of Modern Art and saw an exhibit of environmental works by the Jetty's creator, Robert Smithson. Environmental art, its scale and impact on landscape and human perception highlight the emotional impact that landscape phenomena can have on the human spirit. Walking through choreographed foam spinning on the edges of a salty marble dance floor or seeing what looks like rose quartz crystals peeking over the water's surface reveals the Great Salt Lake as a place beckoning people to participate in landscape phenomena.

In contrast to such moving observations, I have long struggled to understand how the preservation of natural environments can find harmony with the intentional and unintentional changes that are often initiated by human activity in the landscape. Although the answer stills eludes me, I recognized during this first visit to Spiral Jetty that drawing attention to landscape phenomena creates opportunities for all kinds of people to connect and participate with the land in ways that encourage exploration and interacting with the natural systems that support us. The experience was a small door to what has become a growing treasure in understanding the depth of saline lake systems beyond the mere presence of salt.

Returning from one visit to Antelope Island provoked a momentary pause on the causeway to wonder about some long shadows along the high waterline. I approached the objects casting the shadows only to discover that what seemed to be hundreds of simple bumps in the salt shore were actually the carcasses of birds who had once come

looking for life. What had happened? Nothing could have provoked my interest to learn about the lake's ecosystems more.

Since January 2008 I have been employed as Salt Lake City's Open Space Lands Program Manager. In this role I work with the Open Space Advisory Board to identify, acquire and steward over local open space with the intent to protect natural systems and our quality of life.

During my recent attendance to the The 10th International Conference on Salt Lake Research (ISSLR X) and FRIENDS of Great Salt Lake Issues Forum, representatives from around the world reported on conditions of saline bodies. Lectures and presentations on topics ranging from brine shrimp to water and salinity concentrations; bird habitat restoration to nutrient and selenium loads; social perceptions of the Great Salt Lake to research and educational programs; and photographs capturing the phenomenology of the lake. The diligence of the presenting researchers and artists, along with the increased availability of their work, has helped me to better understand the host of challenges to saline lakes and seas around the world. More importantly, I am now more aware of the delicate balance of both ecosystems and human uses supported by the Great Salt Lake.

In short, who doesn't enjoy the hyper colored sunsets, which are a daily phenomena, over the lake? More importantly, how can our awareness of this beauty move beyond the beauty itself? Governor Huntsman's recent creation of the Great Salt Lake Advisory Council is one of many steps in the right direction. It will bring the Lake's issues and opportunities to the forefront of our community discussions and consequently educate people on the diversity of Great Salt Lake issues, who may otherwise simply enjoy the lake's beauty.

The Great Salt Lake, which provides inspiration, resources and critical habitat for millions of migratory birds and other wildlife should receive attention and consideration for its long term, future sustainability.

Emy Storheim
Salt Lake City - Open Space Lands Program
801 535-7730

CHRISTY COTTRELL

2008 RECIPIENT OF THE DOYLE STEPHENS SCHOLARSHIP AWARD

I am originally from northern Virginia. My family moved to Utah just before my tenth birthday and I have lived in South Ogden since then. I am majoring in Microbiology with minors in Chemistry and German. I also tutor for the Geography department. One of my cousins once joked that I was interested in everything from the very big to the very small - and it's true. Outside of the realm of academics, I also enjoy playing soccer and spending time with my family.

Since I was little I have been interested in the world, its different inhabitants and its environments. Recently, my interest has been focused on some of the inhabitants of the Great Salt Lake Ecosystem. My project is part of a collaborative effort between professors from the Zoology and Microbiology departments at Weber State University. Dr. Jonathan Clark, associate professor of Zoology and the head of the DNA lab, has performed a lot of research on brine flies and has worked to characterize them genetically. Dr. Mohammed Sondossi, associate professor of Micro-biology, suggested that we also look at the bacteria that are associated with the brine flies and so our research project was born.

Under their direction, I am using metagenomic techniques to try to discover the identities of the bacteria associated with the brine flies of Great Salt Lake. Basically, metagenomic procedures go a little something like this: we target a specific section of bacterial DNA, make a lot of that section, sequence the DNA from that section, and then see how that sequence matches up with other sequences from other organisms. This of course only works if bacteria are present. It's a little bit tedious at times, but it's exciting when we start to get results. We are analyzing data from our first round of experiments as we begin testing new samples. We are not sure what to expect, but we are interested to see what we will find and then work to determine how these bacteria may fit into the broader Great Salt Lake Ecosystem.

Besides just identifying the associated bacteria, we are also interested to see if differences in the types of bacteria occur based on where the brine flies live in relation to Great Salt Lake.

I'm really excited to be a part of this project and thankful for the support of the FRIENDS of Great Salt Lake! 🦋

BECKI WRIGHT

MEMBERSHIP OUTREACH AND DEVELOPMENT COORDINATOR

Becki received her first experience with FRIENDS while acting as the Graduate Intern two years ago as part of her Masters of Public Administration. As an intern she learned a lot about our work and a lot about Great Salt Lake. She got her feet wet... literally working with 4th graders in the Lakeside Learning Field Trip. That experience was so positive that she decided to apply for the position of Membership & Outreach Coordinator, and is now busy working on membership logistics, benchmarks and renewals.

She graduated last spring with her MPA in Natural Resources Management from the University of Utah. While at the U, Becki was the VP and President of the MPA Student Association. Upon graduation she received the Wendy Rice Service Award. She is a member of the Phi Alpha Alpha Honor Society and recipient of the David C. Williams Memorial Graduate Fellowship.

Recently she returned from the International Symposium on Society and Resource Management in Vermont, where she presented her thesis findings on ecosystem management, place attachment, and collaboration. Becki plans to continue her research in the future pursuing either a PhD or JD.

A Utah native, Becki and her husband Jeff are the proud parents of the adorable one-year-old Ava, named after the American Avocet.

We are delighted to have Becki working with us to strengthen our membership and build our voice for preservation and protection of the Great Salt Lake Ecosystem. 🦋

GREAT SALT LAKE EDUCATION

FROM FRIENDS TO TRACY AVIARY – FAREWELL TO KATIE PEARCE



Katie Pearce by L. de Freitas

After almost four years of working hard for the preservation and protection of Great Salt Lake, our Assistant Director Katie Pearce is leaving FRIENDS. I am sorry to see Katie go. Not only has she been a total joy to work with but she has been a driving force for the organization on many fronts. FRIENDS had the great fortune of having her come to us in a time of transition. Some would call this timing a coincidence but I claim it was cosmic.

Katie arrived when FRIENDS said goodbye to its first education director, Bruce Thompson. Bruce started in 1997, working under contract to develop an education outreach component to raise awareness about the importance of Great Salt Lake and the work of FRIENDS in protecting it.

Through the course of Bruce's many years and to meet the growing demand from educators who wanted to teach their students even more about Great Salt Lake we evolved our informal education program to a more formal one.

The Lakeside Learning Field Trip was designed and the DVD of our slideshow "The Lake Affect; Living Together Along the Shores of Something Great" was created. The possibilities seemed almost endless as FRIENDS embarked on developing a formal curriculum (Project SLICE) for the 4th grade using Great Salt Lake as a system of study for science.

At the same time, the need for FRIENDS to participate in Great Salt Lake protection issues continued to grow as did the demands on my role as the organization's President. We decided to divide the President's role: I became the organization's first Executive Director and Tim Brown became our Board Chair.

With Bruce's departure, we recognized that FRIENDS not only needed someone to fill the huge shoes that Bruce left behind, but someone who would be capable of assisting me with the execution of a passel of administrative tasks to keep the organization going.

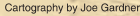
When Katie was hired in 2005 as our first Assistant Director, she was a perfect fit for the organization and a perfect fit with me. She hit the ground running and in doing so made what could have been a bumpy transition virtually seamless.

Katie has worked tirelessly in refining our education program and recruiting volunteers to help on committees, on the board, and in the field. She has been responsible for building recognition and support for FRIENDS from funders, teachers and other nonprofits with her "ever ready" willingness to initiate great ideas and follow through with them. And her masterful touch of professionalism was, much like baby bear's porridge, "just right".

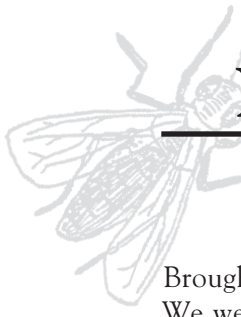
Thank goddess and thanks, Katie. Tracy Aviary is very lucky to have such a gift.

I find solace in knowing that Katie will be there for the Aviary in its time of great need and transition as it works to become a state of the art facility.

In saline,
Lynn



Courtesy of USGS



DR. EPHYDRA - WE WELCOME YOUR QUESTIONS VIA EMAIL OR PHONE

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.

Brought to you by the Science Committee to help explain the science surrounding Great Salt Lake. We welcome your questions via email or phone. Contact Lynn de Freitas at ldefreitas@earthlink.net

Noxious/Invasive Weeds of Great Salt Lake's South Shore Preserve

Today with non-native plants invading the state like a raging out-of control wildfire, the words "weed", "invasive weed" and "noxious weed" are batted about often with an accompanying lack of a clear understanding of meaning.

Referring to a plant as a weed is a human judgmental call that relies on context. One useful definition is: "A plant that interferes with management objectives for a given area of land at a given point in time." J. M. Torrell

Weeds can be harmful or poisonous, compete with native plants, agricultural crops, gardens and lawns or just not be wanted where it is growing.

A good definition of invasive and noxious weeds comes from Executive Order 13112 issued February 1999: A Plant Is Considered Invasive If It Meets Two Criteria. It is non-native to the ecosystem under consideration, and its introduction causes or is likely to cause economical or environmental harm or harm to human health.

Noxious weeds are a legally defined subset of invasive plants within each state or province.

To be an official "noxious weed" requires a designation. The State of Utah Department of Agriculture and Food's "Utah Noxious Weed List" begins with the following: The following weeds are officially designated and published as noxious for the State of Utah, as per the authority vested in the Commissioner of Agriculture under Section 4-17-3, Utah Noxious Weed Act.

The definition of "Noxious Weed" in the Utah Noxious Weed Act is: any plant the commissioner determines to be especially injurious to public health, crops, livestock, land or other property.

Eighteen (2004) plants in Utah are on the list and others are listed as "noxious weeds" in certain Utah counties.

Today areas around the Great Salt Lake are reaping biological consequences that largely began in October 1492. Perhaps it was Vikings or others from the Old World, who first touched ground in the New World, or some long ago, errant, far-wandering forms of life that self introduced, but Columbus's "discovery" of the Americas was the epic event that launched two very different worlds on a path toward biological homogeneity, irrevocably altering the ecology of vast areas of the Americas.

Domesticated animals and agricultural plants immediately accompanied human migrations from Europe. The second voyage of Columbus in 1493 included goats, sheep, chickens, pigs and cattle. Native Americans had successfully domesticated crops such as maize, potatoes, tomatoes but the desire for foods from their eastern hemispheric homeland lead to large scale introduction of crops like wheat and grapes.

While much of the early plant and animal exchange was planned, others happened inadvertently. Diseases like smallpox, to which Europeans had developed an immunity lacking in the Americans, ravaged large numbers of the native human population.

Most of the Old World plants that have found fertile ground in the Americas were not brought intentionally but hooked rides on ships, clothes, mixed with other seeds, in dung, fur, clods of mud and numerous other ways.

Some of the introduced species, lacking natural enemies such as insects or disease and having the ability to thrive in soils disturbed by human activities raged across the continents in some cases greatly out compet-



ing natives. The exchange of plants and animals between the two hemispheres continues.

Today it is difficult in the low elevation valleys of Salt Lake County to find areas where exotics do not outnumber native vegetation.

The South Shore Preserve/Gillmor Sanctuary located several miles north west of the international center provides a case study for this weed issue. The area managed by National Audubon Society includes the remnants of a large, old abandoned river delta of the Jordan River and contains roughly 3000 acres shaped like a large quarter piece of pie. It is comprised of dry intact river channels, saline flats, playas and saline uplands. Along the 3 miles shoreline boundary with GSL lies a long sand dune made of oolitic (calcium carbonate) sand formed within the waters of the lake and blown inland to form dunes which in some places reach 12 feet deep.

The site hosts a rich array of native plants. Salt loving plants such as pickleweed, iodine bush, and inkweed have held their own in the saline mudflats. The upland shrub community consists of greasewood, shadscale, rabbit brush, salt bush and limited sagebrush. Unfortunately the ground between the shrubs grows an almost complete carpet of exotic forbs and grasses. Exotic cheat grass is the predominant plant. A few small patches of natives like salt grass, alkali sacaton, sand drop seed, Indian rice grass, and native wildflowers like sego lily are scarce but can still be found.

Several rather onerous exotic plants are relatively newcomers to the South Shore Preserve. They are highly invasive species which out compete the upland desirable plants of the saline plains that surround the Preserve's wetlands. Each of these invaders is rapidly expanding and threatens to continue to invade and degrade larger areas. Once established these hardy invading plants can be notoriously difficult to eradicate. The three most concerning include Dalmatian toadflax, Russian Knapweed, and Scotch Thistle and are either on the Utah Noxious Weed List or County Noxious Weed.

Dalmatian Toadflax. (County Noxious Weed):
Dalmatian Toadflax is native to southeastern Europe and introduced most likely as an ornamental flower. The yellow blooms resemble a snap dragon. It is aggressive and hard to control. It has been observed recently becoming a serious invader along the oolitic sand dune

that runs adjacent to Great Salt Lake and along some of the roadways.

Russian Knapweed (State Noxious Weed):
Russian Knapweed is native to Eurasia. A chemical substance released by the plant reduces other plants ability to compete giving an edge to the knapweed. It grows one to three feet tall in clones or thick colonies. The small flower is pinkish purple. Many areas adjacent to the South Shore Preserve have heavy infestations and it has been possible to observe the devastation this hardy plant has caused as it has taken over huge areas of uplands nearby with thick monocultural infestations. Knapweed on the Preserve has been springing up in isolated spots and it is urgent to determine the full extent of locations so control methods can be implemented.

Scotch Thistle (State Noxious Weed):
Scotch Thistle is a member of the sunflower family. It is a biennial plant that has reached over six feet tall on the Preserve. Other areas have recorded growths of 12 feet tall. It is native to Europe and eastern Asia. The showy flowers are pinkish purple. Both leaves and flowers are spiny and prickly. Last year the invasion was thought to be limited on the Preserve but a recent survey to the back roadless area show that coverage of this species has rapidly flared.

Other invasive and/or noxious weeds known to be present in varying amounts on the Preserve include tamarisk, Russian olive, cheat grass, field bindweed (looks like morning glory), and white top.

The extent of these weed infestations in large areas of the preserve is unknown. The Audubon site is large and at present has no public access so visitation to the site has been limited. Audubon personnel have focused their time in the implementation of a water delivery system into the low lying areas that define the old river channels in the western portion of the Preserve. Mapping of the upland locations is urgently needed to assist in strategic planning for monitoring and control methods. A reconnaissance mapping began in August 2008 by volunteers. 🐾

Ella Sorensen,
South Shore Preserve Manager, National Audubon

DISCOVERING OUR LAKE

Post Conference Circumspection of GSL



Spiral Jetty Camp by Roger de Freitas

The Great Salt Lake Circumspection Field Trip was such a good idea that I was quite amazed to find so many people before and after the event saying to me 'Oh I wish I'd signed up for that'. Ha.

And to think that I was enjoying myself so much that each night, before turning in, I invoked (quietly, to myself) Shakespeare's words, on the eve of Agincourt, that 'gentlemen in England now abed
Shall think themselves accurs'd they were not here
And hold their manhoods cheap whilst any speaks
That fought with us upon St. Crispin's Day.'

How right I was to do that.

Our little band did not of course rise the next day to kick five bells out of vastly larger party of Frenchman, or if we did it happened before I got up each day and the evidence removed before pancakes were served, but we did keep the show on the road in a pretty challenging environment that we had to explain to each other in the minutest detail as each day progressed.

I went on The Circumspection because I had three quests to meet. The first was to be answered in the name, The Circumspection. It meant that we would go round something that positively invited such a trip. Such a venture was darned difficult to organize without certain grownups (several true-ologists and a former State Geologist) being in charge, and that number would not include me.

I also wanted to know about the colors of the lake. I have flown in and out of SLC often enough to know that the lake has areas of markedly differing colors, and I wanted to know why this was. This question was answered in part by a session at the conference that pondered what made up colors in very saline conditions, but the field trip would still allow us to test a few hypotheses, or at least look close up.

And the third quest was one which came wholly out of one conference presentation where the results of a survey on people's attitudes to their neighbor, the lake, showed that a rather nasty, fly-ridden wet place proved to be very welcome in the local community because it made a great foreground for sunsets.



My Quest Number Three was then: Does the lake make a great foreground for a sunrise?

After we had seen the bird festival at Farmington and equally birdy glories of the Bear River delta, we went west, and joined the transcontinental railroad beds towards Golden Spike, where the hillsides above revealed the succession of lake levels in a fine light. Genevieve insisted we take a group picture whilst we dodged the traffic (Utahns are very sensitive to traffic, which they define as more than one car every couple of minutes). No one was injured.

We caught up with the lake again by Spiral Jetty. We camped on the beach, carrying our kit down over "snake-infested rocks" (someone had seen one and so we all whooped and hollered for a moment before resuming the task of ferrying chairs and ice-buckets and stoves). The decision to abandon dry land led some to reflect, over morning coffee, that feathers and sagebrush make a more comforting bed than sand, even with a well-positioned hip trench.

After breakfast, the eminence from China walked far out into the lake, to the point where he was but a dot in the viewfinder of a 12x digital camera and where the lake water must have just covered his toes. He dug furiously, like a Jersey bait digger up against time and tide, before flinging his arms out to declare that he had found something. The people who hadn't looked, and so of course had not found, oohed and aahed over his gypsum crystal. Lovely stuff.

At the Golden Spike we witnessed a poignant moment at the memorial to all the Chinese who had died in the making of the railroad, and then set out to find old railroad spikes as souvenirs. Our course took us west, along the old grade, past ponds full of enormous carp, past an old cemetery in an empty landscape like a western set.

Camp was called in this very unfilled landscape with a simply fantastic view in every direction. We had the pelicans below us at Gunnison Island, and the ponds of differing colors to the south.

For those who were up, and that was not everybody, the moonset next morning was to die for, although the clouds in the east made the sunrise unmemorable. Quest Point Three remains unanswered.

As we bumped our way south, down to lake level some heard Ty's explanations of the depredations caused to the vegetation by grazing sheep. Others argued with Genevieve

about the beaches and the wave formed nature of some of them, or not. Merry ology, car by car, hour by hour.

The west side of the lake was open to us because we had permission to drive along the dikes. And there were the colors, changing as the salt concentrations changed within the water. That was easy. Forget the science. It looked interesting.

Where the track met the real working railroad we lay on the tracks and listened for trains, as the site simply invites you to do. We couldn't hear any. Nor could we hear the UP truck drive up and its driver descend to warn us that we were either foolish or very naughty to even think of doing something fun like that. It was never clear from where in the emptiness the UP man had seen us, but we were Warned.

Tom Tripp, our host at US Magnesium, at the end of this very hot afternoon managed to pull the most wonderful surprise just when I was feeling a tad overexposed to salt and lakes and brine shrimp and flies. In a large cold shed built for repairing the big yellow trucks and the huge pumps that keep the company going he produced a cooler box full of popsicles. They came in a magnificent range of colors (and dubious flavours) that you'd half come to expect in this exotic landscape that had been our host for three days.

I wanted colors, but didn't expect to find them in ice-cold glory in a maintenance yard. Bravo Tom.

This was all great fun, involved hundreds of miles, and hours of driving, and answered almost all my needs. I still have to go back to the far west shore line and watch sunrise on a cloud free morning. That of course will be almost impossible, unless the rest of the ologist-grownups who made this possible want to escort me. 🐼

Roger de Freitas is an itinerant ologist who lives in London, where he works on good governance issues with environmental and community-based NGOs. He is on the advisory board of Global Nature Fund, which runs the Living Lakes Network of lake protectors, who work with each other to grow their skills to help local communities protect wetlands. He likes a good field trip, whatever the weather.

HOW TO REACH US

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Lynn de Freitas ldefreitas@earthlink.net or call 801-583-5593.



MAKING A DIFFERENCE

GREAT SALT LAKE PEOPLE

At a press conference on May 8th, Westminster College announced the creation of the GSL Institute, an organization that endeavors to increase the appreciation and understanding of Great Salt Lake with interdisciplinary emphases on research, education, commerce and the environment. Dr. Bonnie Baxter, Assoc. Professor of Biology is heading up the Institute. The Institute will provide another beacon of light for building Great Salt Lake recognition.

Margie Nash, volunteer extraordinaire who has been helping us with our Lakeside Learning Field Trips was awarded the 2008 Utah Environmental Educator Volunteer from the Utah Society for Environmental Education (USEE). Congratulations!

Welcome to Craig Garner, who is the new Ducks Unlimited Regional Biologist for Utah and Eastern Nevada. Craig is working to conserve vital wetland and avian resources in Utah. He succeeds Jeff McCreary, who is the Manager of Conservation Programs for DU.

Another baby on the board, congratulations to Amy Price (FRIENDS Treasurer) and Patrick Leary on the birth of their son Liam Flanagan Leary, who was born May 12th. Liam made his social debut at our October 2nd Membership Party. He is very good at shaking hands with his feet.

Farewell to Tim Wagner, Director of the Utah Smart Energy Campaign – Utah Chapter of the Sierra Club. Since 2004, Tim has been working collaboratively throughout the state to advance smart energy principles. Tim has accepted a position with Resource Media, a nonprofit media consulting group based in San Francisco but luckily there is an office in Salt Lake City. We look forward to bumping into Tim at the usual haunts around town and wish him great success in his new position.

Big salty hugs to our dear friend Rosalie Winard, photographer and author of her first book *Wild Birds of the American Wetlands* (WelcomeBooks, 2008). Her book is powerful and visually stunning, and won 2nd place in the IPA awards – International Photography Awards in the professional photographer's books – Nature Category. An exhibit of her work will open at the end of October at The Utah Museum of Natural History. Definitely a must see.

Hikmet Loe, Utah Humanities Council and authority on Robert Smithson's Spiral Jetty, is the author of the upcoming publication *Range of Convergence: The Histories of the Spiral Jetty and Rozel Point* (USU Press, 2009). You go girl!

Congratulations to Dr. John Cavitt, Weber State University on his recent appointment as Assistant Coordinator of the Linking program. Linking is a hemispheric partnership between Canada, the US and Mexico that is working to advance range wide migratory bird and habitat conservation through education, research and ecotourism efforts.

Congratulations to Dr. Steve Simms, Professor of Anthropology at Utah State University and member of the FRIENDS Advisory Board on his recent book *Ancient Peoples of the Great Basin and Colorado Plateau*, by Steven R. Simms (Left Coast Press, 2008) <http://www.LeftCoastPress.com>. An excerpt of his book can be found on our website under Research.

Lake Fact:

There are 20 large water rights that divert directly from the lake. In 2007, how many acre feet of water did these rights divert from the lake?

Answer: 315,000 acre feet. (1 acre foot of water = 236,000 gal. which is enough water for a family of 4 for 1 year)



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