

FRIENDS OF GREAT SALT LAKE

P.O. Box 2655, Salt Lake City, Utah 84110
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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, and advocacy.

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Cullen Battle and Marc Heilesen

speakers for the October 27th Friends General Membership Meeting

In addition to the election of officers and board member positions, this meeting will also provide specific information we can use in commenting on the Legacy West Davis Highway DEIS. Both Cullen and Marc have been actively involved in working on the Legacy West Davis Highway issue. Their insights will be useful. Come with questions, paper and pencils. Bring your neighbors and friends. This meeting is the day before the open house and public hearing on the draft EIS. (See the President's message on the next page.)

Cullen Battle is an attorney with Fabian and Clendenin.

Marc Heilesen is an intern for the Utah Chapter of the Sierra Club working on the Stop the Legacy Highway Campaign.

October 27, 7:00 pm, Sugarhouse Garden Center, 1650 E. 2100 S.

James W. Carter

Speaker for the November 22 Friends General Meeting

Over the past year, a resource inventory of the Lake was made through extensive internal and external scoping meetings. Friends participated in that process. At this meeting, Jim will give us an update on the status of the Great Salt Lake Planning Project. A statement of the current conditions of the Great Salt Lake is ready to be made public, as well as an outline of future management alternatives for the Lake. Since the public will be invited to make comments on this information, you'll want to join us for this meeting.

Jim Carter has been the Director of the Utah Division of Oil, Gas and Mining, a division of the Utah Department of Natural Resources since April 1993. The Division administers environmental regulatory programs for the development of oil, gas, coal and non-coal minerals. Last year, he temporarily relinquished his duties as Division director to lead the comprehensive planning effort on the Great Salt Lake for the Department of Natural Resources. The goal of the Great Salt Lake Planning Project is to enable the Department to coordinate management responsibilities and resolve management issues concerning the Lake.

November 22, 7:00 pm, Sugarhouse Garden Center, 1650 E. 2100 S.

~~NOTE: General Meetings are held at the Sugarhouse Garden Center, Located in Sugarhouse Park next to Highland High School. Board meetings are held at the Salt Lake County complex on 2100 S. State St., Room S3009 (South Bldg.) All members are encouraged and welcome to attend.~~



President's Message

It's no surprise that a cruise on Great Salt Lake is always a very special experience. As I write this message to you, it is the day after our "Lazy Fall Cruise" on the Island Serenade. The day began with predictions of thunderstorms, rain, funnel clouds, and high wind warnings. The sky was charcoal and silver, as we made our way to Antelope Island for our departure, but we were undaunted as we boarded. We were heady with the excitement of spending the better part of our Saturday on the Lake, regardless of how threatening the weather might be. As we left the marina, "the lake affect" began to take hold. After getting lost in its splendor and magnificence, we were engaged by the Lake under a canopy of hot autumnal sun and bright blue sky. We returned 6 hours later, charmed, and just a little bit smug in our realization that we beat the odds.

Questions, and concerns, mixed with smiles and even a few cat nappers, filled the afternoon. "What happens next with the Legacy Highway?"

On October 2nd, the DEIS will be available. The public will have 60 days until December 1st to submit written comments. On October 28th at the Bountiful Junior High School (400N 30W) an Open House (4-10PM) and a Public Hearing (7-9PM) will be held. It is important for all of us to participate in this process and make our opinions heard. After the comment period ends, the Army Corps of Engineers will deliberate over whether or not the project is permissible, and then, early next year, a record of decision will be made by the Corps.

On October 27th, (the day before the Public Hearing) our general membership meeting will provide information on the DEIS to help you make comments (see our meeting announcement). We will also have a brief slide-show program that will show us those wetlands directly impacted by Alignment C. I hope you will be there and invite your friends and neighbors to join us. If you have questions or are interested in helping out with a Friends display, please contact me at our email address <FOGSL@xmission.com>

As Captain Steve Ingram drew our attention to the smokestacks of MagCorp, someone mentioned Ella Sorensen's recent article about counting Wilson's phalaropes with Don Paul. During their aerial search they discovered close to 300,000 phalaropes congregating on the western shore of Great Salt Lake just north of MagCorp. The irony of these birds taking their daily ablutions and foraging for brine flies next to a major chlorine emitter was sobering. That's why Friends believes in participating with CACC in holding MagCorp accountable for their industrial pollution into the air and waters of Great Salt Lake. You'll notice a CACC Update in this issue.

Interest in the Lake as a terminal basin brought about renewed discussion over the creation of a comprehensive watershed management plan. Friends has identified this as a major long term goal. Read Bruce Waddell's article on "A Contaminants Health Check of the Great Salt Lake Wetlands". It is insightful.

"Is The Lake Affect. still on tour?" You bet it is! As we schedule another 50 presentations to groups in the communities surrounding Great Salt Lake, we are also developing a proposal to create a Great Salt Lake Curriculum so that learning about the Lake can become a part of every 4th graders' experience in school. In conjunction with these continuing efforts, you will be receiving a special fundraising letter asking for your support to help further the reach of the Lake (no pun intended).

Our Education Director, Bruce Thompson, will also be sharing resource materials about the Lake in a five-part newsletter series. These sheets of information "What About This Great Salt Lake" were drawn from all the documentation that he collected over the past year in preparing The Lake Affect... The first installment is inside.

Friends is 16 members stronger from our Fall cruise. New memberships and renewals are the lifeblood of the organization. We appreciate the growing interest in Great Salt Lake, and certainly, a component of furthering our mission is your participation in activities we provide, issues impacting the Lake, and our monthly programs at the Sugarhouse Garden Center. The October 27th general membership meeting is one to mark on your calendars now. I hope to see you there.

Lynn de Freitas



Board Elections and Bylaw Revisions

The October 27th general meeting is the time for the Friends' Board of Directors elections. This year, a change in the by-laws of the organization will also be placed on the ballot.

The officer positions are elected every year. General board member positions are two year terms. This year, six officer positions and four general board member positions are to be voted on. However, in the event that the by-laws revision is passed, (see below) only four officer positions will be filled.

The following are the candidates and the offices they seek.

President

Lynn de Freitas. Having completed her first year as President, Lynn is looking forward to strengthening the educational activities and focusing on the issues that threaten the ecosystem. She is concerned about urban growth and wants to be looking closely at the upcoming Great Salt Lake Plan as well as being a catalyst for establishing a comprehensive watershed management plan.

Vice President

Margy Paul-Hus. Margy is committed to Friends and an advocate of our recycling program and the Adopt a Highway cleanup. As Vice President she would be the chair of the membership committee which recruits members and updates the membership data base.

Treasurer

Spencer Martin. "Meticulous and responsible" are requirements for the treasurer's position and Spencer has proven his worth this last year. He understands the important niche in the community that Friends hold to protect the Great Salt Lake ecosystem.

Secretary

Michele Davis. Volunteering for a worthy cause and helping others are the motivations for Michele in seeking re-election. She has found that she has learned much about Great Salt Lake on field trips and even in board meetings as she listens to other lake enthusiasts.

The following candidates are seeking general board member positions.

Ann Dick. The future of Great Salt Lake and threats to maintaining a viable ecosystem is the foundation for Ann's dedication to Friends. She sees Friends as a resource which provides information about the Lake and ways to protect it. She is currently working on a Great Salt Lake curriculum for the Utah Natural History Museum's Junior Science Academy that will reach 4th graders in Salt Lake valley.

Lindsey Oswald. After working as an intern for Friends on the 1998 Issues Forum, Lindsey wanted to get further involved with the issues threatening the Lake. She is an enthusiast of mountain and desert regions and realized that Friends provides an opportunity to add another ecosystem to her knowledge. "Besides that," she says, "it's so much fun!"

Catherine Quinn. After years of supporting Friends in other ways, Catherine now feels she can devote some time to the duties of a Board member. She has extensive knowledge of the Lake's ecosystem, planning, and resource management.

When Friends adopted their by-laws in 1994, the Board of Directors consisted of 15 members, 6 of whom were officers. The officer positions included the President Elect, President, Past President, Vice President, Treasurer, and Secretary. The President Elect served a one year term in anticipation of becoming President the following year. The Past President served a one year term after being the President. The Board found that the President may need more than one year to fully grow into the position. Thus, the Board is asking the membership to eliminate the President Elect and Past President positions and to allow the President to seek re-election for more than one year's term. The total number of Board positions would be 13.

Term limits are also vague and confusing in the original by-laws. The Board is asking the membership to consider a term limit of a total of six years for any combination of years served as an officer or general board member. After six years, a one year retirement from the board is required before seeking re-election.

A yes vote on these issues will allow the Board to be more effective and efficient in upholding the mission of Friends

The Case Against the Legacy Highway

See the WWW page: <http://stoplegacyhighway.org>



A Day in the Life of a Wetland Manager

Layton Wetlands Preserve

by Joel Peterson

I have been managing the Layton Wetlands Preserve (and tutored by it) for nearly one year. Those things that began as surprises last year will become anticipation for the next. As I reminisce about what it is I do, thumbing through my field book and thinking of the people I have met, I realize that no two days are alike. In fact, when getting dressed in the morning, I often ask "Let's see, was it supposed to be a neck tie or waders today?" I recently walked into a meeting wet and muddy from helping to dislodge an air boat stuck in the marsh during a water bird count earlier that morning. The essence of Great Salt Lake mud must have added a scent of authenticity to the wetland topics we discussed.

Previously, I was involved in developing the Preserve's Site Conservation Plan and continue planning at the Preserve. I also am involved in lake-wide topics and have been able to help with international issues involving the lake. But what once was only a place on paper, the Preserve has come alive for me as I work on-site. It has drawn me into its ecological cadence as an observer, interpreter and participant. I am equally awe-struck by a colony of 900 eared grebe nests as when I'm innocently suckered by nature into laying in a drainage ditch at dusk in order to catch a glimpse of an impish chorus frog. I sometimes ask this enigma of a lake out loud "Tell me your secrets so that I may help you!" I think the Great Salt Lake environment is continually revealing unguarded secrets through the things we all can observe.

The Preserve, a complex of marsh, playa, wet meadows and uplands, has undergone many alterations through time—both from humankind and from the Great Salt Lake itself. One of our most important conservation strategies is to allow the lake's salty water to be an integral part of the marsh, naturally maintaining the dynamic, successional flux of plant communities—enabling a diversity of habitats and species niches. The often out-of-sync human alterations can be slowly mended through restoration activities such as un-channelizing a creek or removing exotic, noxious weeds (I've found enemies I didn't know I had: Scotch thistle and purple loosestrife.)

Field notes, 27 April 1998: Susan and I see a long-tailed weasel just 30 feet away. At it runs, it strings four young behind it. When it stops, the young huddle close making it look like one animal again. It (they) repeat this start and stop, like a child's slinky toy, until the furry caravan disappears into the vegetation.

Many volunteers help me at the preserve. Susan helped me establish bird blinds and tours for International Migratory Bird Day. Her expert eye spotted a nesting snowy plover near the parking area. I later posted a sign "closing" the playa to human activity to give the birds a chance. The birds seemed to be selecting sites more upland than before due to the high water this year. The nest failed but the sign lasted nearly three months before it became a target for a nut with a shotgun.

There is so much to learn and even more to do. I work to integrate the Preserve into the community and hope to witness a growing conservation ethic among local residents. I gather information and study community outreach strategies, weed management, wetland science, monitoring methods, species' life histories and the unique Great Salt Lake. I'm developing data in a computer mapping and information system as a preserve management tool.

My office has become a library without a librarian. The stacks of books and papers surround me in some sort of paper alchemy that ties this jack-of-all-trades job together—an ecosystem of articles addressing the complex challenges of stewardship. If you ask me what I do, I may just put my thumbs in my arm pits, stick out my chest and say in a drawl, "fixin' fences!" But give me a moment and I'll explain why, and hopefully, you'll be drawn into this special place—the Layton Wetlands Preserve.

Field notes 27 July 1998: Investigated 15 head of trespass cows. Fences are down or in disrepair on east boundary. Sun has set as gold (I must be off the time clock). Great blue heron...flying toward rookery? Sandhill cranes making a raucous like they're saying good night to each other. I love this place.



Dioxin Testing at MagCorp Finally Begins

But First Tests Won't Answer Citizens' Questions

Due To Poor Testing Design

By Scott Endicott and Howard Gross

September 13, 1998 - After two years of concerted efforts by the Citizens Against Chlorine Contamination (CACC), the Utah Department of Environmental Quality (DEQ) is scheduled to begin dioxin testing at MagCorp on Wednesday, September 16, 1998. Samples of water and solids from MagCorp's evaporation ponds and from a waste ditch running away from the magnesium producer's plant will be collected. CACC has been asking questions about emissions from MagCorp on behalf of the public for two years and is pleased that DEQ is taking a first step towards answering them. Unfortunately, this sampling will not provide a complete picture of dioxin production and emissions. Better-designed testing is needed and should proceed promptly.

Background

MagCorp produces magnesium at its plant in Rowley, Utah, on the southwest border of Great Salt Lake. Lake brine containing magnesium chloride is concentrated in ponds, dried, then melted and electrolytically split into magnesium and chlorine. According to US EPA's Toxic Release Inventory (TRI), MagCorp is the largest emitter of toxic chemicals in the entire United States, primarily due to their chlorine and hydrochloric acid emissions. Although dioxins emissions must be reported to the TRI, MagCorp has never documented the presence or absence of dioxin emissions, even the company admitted in a September 3, 1998 letter to DEQ that dioxin emissions are probably occurring.

Dioxins are a family of man-made, unintended by-products of certain industrial processes using chlorine. Dioxins are some of the most potent man-made toxins known. They are known to weaken animal's immune systems. In laboratory experiments, they cause cancer and act as endocrine disrupters. Dioxins are accumulating in the environment, spreading around the globe, and moving up the food chain as one animal eats another. Animals at the top of the food chain (predators, humans) currently accumulate body burdens that are at or near levels shown to be toxic in laboratory tests. The cancers seeing the largest increases in the US are related to endocrine dysfunction (pancreatic, prostate, breast, ovarian, and cervical) and may be due to the accumulation of these hormone mimickers such as dioxins in our environment. Some other disorders possibly caused or worsened by dioxins are endometriosis, attention deficit disorder, diabetes, and chronic fatigue syndrome.

Testing Two Years In Coming

CACC first raised concerns about probable production of dioxins at MagCorp in public comments to DEQ in August 1996. Friends of Great Salt Lake was a co-signer to those comments. CACC pointed out that a similar plant in Norway is known to produce dioxins and that the well-known requirements for synthesis of dioxins are present in the MagCorp plant. CACC has provided scientific suggestions, negotiated, prodded, and cajoled the State to develop a testing protocol that will produce useful information at the least expense.

First Tests Won't Answer Citizen's Questions

Although happy to see testing start, CACC is disappointed with the sites that DEQ has chosen for dioxin testing. They represent a timid and tentative approach to a potentially serious environmental health problem. CACC believes that the testing should measure the total production of dioxins at the plant so that the risk can be ranked with respect to other dioxin sources and other hazards to the citizens and environment of Utah.

The testing should also determine the fate of dioxins, if they are present. Is it the waters of Great Salt Lake? To land fills? Into products other than magnesium that the company produces? DEQ suspects that MagCorp may be burying dioxin-laden waste on their property. To find answers to these questions, CACC believes that DEQ must test the processes in the plant that are scientifically determined likely to be producing dioxins. Then, with MagCorp's cooperation, DEQ should determine the fate of all material streams leaving these processes. To date, the company has been recalcitrant concerning the dioxin testing, and DEQ has not demanded



the information needed to begin answering the above questions.

More In-Depth Testing Needed

DEQ and CACC agree that the most likely processes to produce dioxins are MagCorp's "melt reactor" and the electrolytic cells. These processes contain carbon and chlorine heated to high temperature - necessary conditions for de novo synthesis of dioxins. Both processes have scrubbers to capture hydrochloric acid, and it is expected that particles collected in these scrubbers contain dioxins. Therefore, CACC has urged DEQ to test the scrubber liquids and determine where the liquids go. At this point, neither DEQ nor CACC knows the fate of the scrubber liquids or the particles in them, but an unknown amount may be poured into a ditch leading to an unlined pond on MagCorp property. This ditch and pond will be the focus of DEQ's sampling planned for September 16, 1998. Since neither DEQ nor the public know where the scrubber waters are sent, CACC cannot view these tests as a definite determination of dioxin at MagCorp. If no dioxins are found, we cannot exclude the possibility that is present somewhere else in the plant. If dioxins are found, the data will not be sufficient to quantify annual dioxin production for the entire facility.

Because of the uncertainty caused by the choice of test sites, CACC urges DEQ to follow these tests quickly with tests of the processes in the plant that are scientifically expected to produce dioxins. Furthermore, we urge MagCorp to cooperate with DEQ and open a dialog with the public regarding the fate of dioxins, if they are found, and to take steps to reduce dioxin production and control their release.

Other CACC News

CACC has submitted lengthy comments to the Division of Air Quality (DAQ) regarding a draft of the Title V Operating Permit currently being developed for MagCorp and will be meeting with DAQ on September 17 to discuss these concerns.

CACC and six other community groups, including Friends of Great Salt Lake, nominated John Veranth to fill the vacant environmental representative seat on the Utah Air Quality Board (AQB). Our nomination was accepted, and Mr. Veranth was formally appointed to the AQB in July. Mr. Veranth is very knowledgeable about air quality issues and control technology, and therefore is someone Utah's environmental community can rely on in comprehending complex air quality issues. He has proven his commitment to Utah's environmental community through countless hours of unselfish public service to the Wasatch Mountain Club, the Bonneville Shoreline Trail Committee, and the Utah Wilderness Coalition. He also is an excellent communicator and listener, and shares CACC's concerns about MagCorp.

Did You Know?

MagCorp is owned by the Renco Group, which is 90% owned by Ira Rennert. Renco ranks 51st on Forbes' top 500 private companies list. Rennert has come under fire from government agencies for excessive pollution and violating air and water standards at many of its subsidiary mining companies. The Environmental Protection Agency has begun at least 40 enforcement actions against Renco Group subsidiaries since 1995. Renco has addressed some of the complaints; others are ongoing.

Mr. Rennert is currently building the largest private residence in America in the exclusive Sagaponack area of Long Island, New York. Once completed, the home, including out-buildings, will be over 100,000 square feet, twice the size of Bill Gate's mansion. The mansion is opposed by the Sagaponack Homeowners Association, which is suing the town's chief building inspector and the local Architectural Review Board to stop construction of the home. The Group for the South Fork, a local environmental group, has stepped in to assist the homeowners association, arguing that more environmental impact review (on water supply and a local colony of endangered birds) should have been required. (Source: Newsday, 9-9-98, articles by Randi Feigenbaum, Joe Haberstroh, and Mitchell Freedman)



A Contaminants Health Check of the Great Salt Lake Wetlands

by Bruce Waddell

The U.S. Fish and Wildlife Service (Service) has trust responsibilities for the protection of endangered and threatened species, migratory birds and their habitats. Environmental contaminant issues fall under this umbrella. The Utah Field Office currently has a staff of 6 biologists examining contaminant issues in Utah. In 1995 we initiated an evaluation of contaminants in the wetlands along the south and eastern shore of the Great Salt Lake (GSL). The size of the wetlands and their value for migratory birds is well known. However, until recently, little was known about contaminant levels in the wetlands, migratory birds or in the food chains supporting migratory birds in the GSL.

We believed that some baseline data was essential to evaluate the current condition of the wetlands relative to contaminants and provide a means for comparison in future years. Drainage from the entire Wasatch mountain front including parts of Wyoming and Idaho enter the lake. The southern part of the front is heavily industrialized and supports an urban population of about 1.6 million people that is rapidly expanding from the influx of light industry in the area, notably semiconductor and other electronic manufacturing. In addition, the valley includes numerous historical and active mining operations including the largest open-pit copper mine in North America. Industrial and urban development in the valley contribute a diversity of contaminants to the GSL system, particularly lead, arsenic, mercury, cadmium, boron, selenium, copper, zinc, polychlorinated biphenyls (PCB's), petroleum hydrocarbons, and others. Over time, these contaminants tend to move down gradient from sources in the valley to the GSL where nonvolatile pollutants accumulate because the GSL is a closed basin with no surface water outlet and thus no flow-through conditions to physically carry contaminants out of the system.

Understanding the distribution and degree of contamination in wetlands bordering the southern and southeastern shores of the GSL is essential to efforts of reducing contaminant loading to the lake. There are many opportunities to prevent this loading but data are required to convince industrial and municipal sources of the need for source control.

Currently, the Great Salt Lake and some of its tributaries do not have numerical water quality criteria. Through participating in the State of Utah and EPA triennial review process of setting water quality standards, the Service hopes to establish the needs for the adoption of numerical criteria for these tributaries and the lake.

Understanding contaminants in GSL wetlands also is critical to recently expanded efforts for protection and restoration of wetlands in the GSL system. Federal, State, local, and private entities are implementing new initiatives on wetland enhancement and mitigation in the Salt Lake Valley. A significant part of the initiatives are wetland acquisitions by National Audubon and Utah Reclamation, Mitigation and Conservation Commission (URMCC) in partnership with local communities on the south and east side of the GSL. Further, development and management of the recently purchased National Audubon Sanctuary, Kennecott mitigation, and airport mitigation properties likely would be affected if contaminant limitations were identified. The study was designed to meet the information and management needs of the Service and its partners in protecting and restoring the chemical quality of GSL wetlands.

Three objectives were identified:

1. Assess the general distribution and degree of contamination in GSL wetlands representative of wetland types and locations most significant to migratory birds along the southern and southeastern shores.
2. Conduct detailed contaminant assessments of specific wetland types and locations considered at risk from contaminant sources and loading and evaluate pathways of exposure posing significant hazards to migratory birds.
3. Analyze spatial and temporal correlations between contaminant sources, wetland types, degree of contamination, and impacts on migratory birds in the southern GSL system (Salt Lake, Davis, Weber, Tooele, and Box Elder Counties, Utah).



The study focuses on impacts to migratory birds and as such, we look primarily at important life stages and pathways. We approached the study in two phases. Phase 1, which we have nearly completed, involved sampling a large number of areas for indicators of a wide range of contaminants. Because of the large area of wetlands possibly affected, the study focused on representative wetland types and we usually sampled where contaminant sources would enter the wetlands via water. And, during Phase 1, by using a combination of direct measurements and indirect indicators we felt that significant problems would be identified. Phase 2, which we hope will be fully funded this year, will focus in more detail on a small number of the sites sampled in Phase 1 that appeared potentially most likely to have problem levels of contaminants and are associated with areas of significant bird resources. Depending on the results of analysis of samples from the South Arm GSL, additional sampling might occur there also.

During Phase 1, the majority of the sampling focused on 26 wetland sites. Some samples were collected away from the 26 wetland sites. On the South Arm of the Great Salt Lake eared grebes were collected at three sites and samples of brine shrimp, and/or their eggs and sediment were collected at 12 sites. A single sample of fish was collected from Timpie Springs. Samples collected included sediment, invertebrates, bird eggs, and some bird livers. We also analyzed whole fish where available because they not only represent food for some birds, but are also an indicator of a local contaminant condition that does not migrate in or out.

Samples were analyzed using a fairly wide range of tests that measured contaminant levels directly, such as inorganic elements (metals), organics such as organochlorine pesticides, PCB's, polynuclear aromatic hydrocarbons (PAH's), total petroleum hydrocarbons (TPH) and dioxins. Indirect tests were also performed to detect stress that could be caused by contaminants. These included measurement of the ratio of estrogen to testosterone, cholinesterase inhibition as an indicator of pesticide contamination, and EROD (ethoxyresorufin-o-dealkylase), a liver enzyme responsive to increased levels of some contaminants.

By far the largest number of analysis were for metals, followed by organochlorine residues and PCB's. At 10 sites, fish were analyzed for PAH's, cholinesterase inhibition, estrogen/testosterone ratios and EROD. Most sediments were analyzed for total petroleum hydrocarbons. Six samples were analyzed for dioxins.

Current Project Activities and Midstudy Conclusions

We have proposed a final year of data collection, Phase 2, during 1999 followed by final data analysis and report preparation in 2000. We are virtually finished with the generalized (Phase 1) level of investigation but are still awaiting some data. Although Phase 1 results we have received demonstrate that some identified contaminants occur at virtually all of the study sites in various media sampled, only five sites have been selected for further investigation. The selection was based on those sites where identified contaminants occurred in several different media and/or those areas which were identified as highly significant to migratory birds. The sites identified include: south shore area (South Arm), North Salt Lake wastewater treatment wetlands, oil drain, Farmington Bay Waterfowl Management Area and Ogden Bay Waterfowl Management Area. The contaminants identified at these sites consist primarily of inorganics, organochlorines, PCB's and PAH's. However, not all contaminants of concern identified occur at all five sites. The screening criteria for these contaminants that we used were the lowest found in the literature and are therefore very conservative. Due to the anticipated limited funds likely available in 1999, study of all five sites is unlikely and will require further prioritization. Final sites will be determined by funding, partnering efforts with EPA, USGS, and other agencies, and by access and time constraints.

Many thanks for your support:

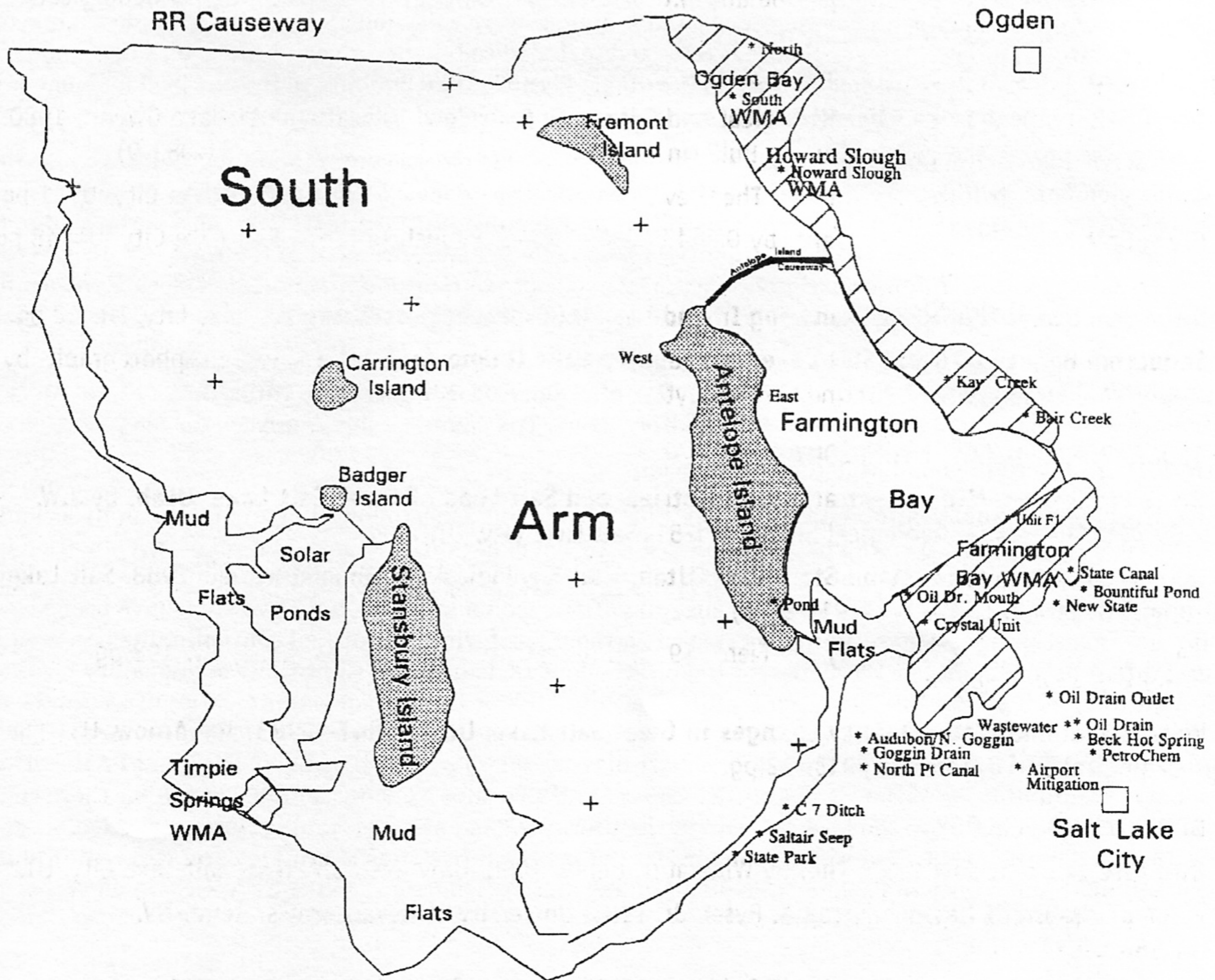
Kinkos University Branch

and

Graphic Images 380 E. 900 S. SLC



Figure 1. Great Salt Lake Contaminants Assessment Study Sites





What About This **Great Salt Lake?**

A Resource List

GENERAL INFORMATION

- Commonly Asked Questions About Utah's Great Salt Lake and Ancient Lake Bonneville**, by J. Wallace Gwynn. 1996. UT Geological Survey #PI-39. Salt Lake City, UT. 22 pg. (ISBN 1-55791-378-1)
- Great Salt Lake, The**, by W.R. Hassibe and W.G. Keck. 1991. US Dept. of the Interior, US Geological Survey, Denver, CO. 24 pg.
- Great Salt Lake, The**, by William Lee Stokes. 1990. Starstone Publishing. 30 pg.
- Great Salt Lake: A Scientific, Historical and Economic Overview**. edited by J. Wallace Gwynn. 1980. Utah Geological and Mineral Survey Bulletin 116. Salt Lake City, UT. (ISBN 1-55781-083-9)
- Great Salt Lake Information Sheet, The**. Revised 1998. UT Geological Survey. Salt Lake City, UT. 1 pg.
- Great Salt Lake, Past and Present**, by David E. Miller. 1992. Publishers Press, Salt Lake City, UT. 48 pg. (ISBN 0-9639924-0-6)
- Great Salt Lake, The: Utah's Amazing Inland Sea**. 1993. Salt Lake Tribune, Salt Lake City, UT. 32 pg.
- Seductive Beauty of Great Salt Lake: Images of a Lake Unknown**, by Ella Sorensen, photographs by John P. George. 1997. Peregrine Smith. Layton, UT. 96 pg. (ISBN 0-87905-703-3)

GEOGRAPHY, GEOLOGY, HYDROLOGY

- Brine Properties, Mineral Extraction Industries, and Salt Load of Great Salt Lake, Utah**, by J.W. Gwynn. 1997. Utah Geological Survey #PI-51. Salt Lake City, UT. 2 pg.
- Geology and Antelope Island State Park, Utah**. Utah Geological and Mineral Survey. 1988. Salt Lake City, UT. 20 pg. (ISBN 1-55791-299-8)
- Geology of the Great Basin**, by Bill Fiero. 1986. University of Nevada Press. Reno, NV. 198 pg. (ISBN 0-87417-084-2)
- Water Level and Water Quality Changes in Great Salt Lake, Utah, 1847-1983**. Ted Arnow. US Geological Survey Circular #913. 22 pg.

BIOLOGY AND ECOLOGY

- Bird Life of Great Salt Lake, The**, by William H. Behle. 1958. Univ. of Utah Press. Salt Lake City, UT.
- Birds of the Great Basin**, by Fred A. Ryser, Jr. 1985. University of Nevada Press. Reno, NV. (ISBN 0-87417-080-x)
- Sagebrush Ocean, The**, by Stephen Trimble. 1989. University of Nevada Press. Reno, NV. (ISBN 0-87417-222-5)
- Wetlands of Utah**, by Daniel Vice and Terry Messmer. (no date) Utah State University, Logan, UT.

HISTORY

- Great Salt Lake, The**, by Dale L. Morgan. 1947, 1975. University of Nebraska Press. Lincoln, NE. Reprinted by Bison Books.
- Exploring the Great Salt Lake: The Stansbury Expedition of 1849-50**. Edited by Brigham D. Madsen. University of Utah Press. 1989. 889 pg. (ISBN 0-87-480-325-X)



EDUCATION

A Salt Lake Valley Field Trip Guide for educators teaching 8th grade science, by Gregory Bemis. 1990. Utah Geological Survey #FR-200. Salt Lake City, UT.

Great Salt Lake Story, The: An Interdisciplinary Activity Guide, by Sandra Zicus, editor. Revised 1997. Utah Museum of Natural History. Salt Lake City, UT.

MAPS

Antelope Island State Park, Davis County, UT. 1995. Utah Geological Survey #PI-16. Salt Lake City, UT. 1" = 3200'.

Geologic Map of Antelope Island, Davis County, Utah. H.H. Dolling and others. 1991. Utah Geological Survey #127. Salt Lake City, UT.

Major Levels of Great Salt Lake. Map #73, by D.R. Curry, G. Atwood, D. Mabey. 1983. 1:500,000. Utah Geological Survey.

MEDIA

Desert Sea, A. (video) 1993. (ISBN 917.92 D451)

Lake Affect, The. (slide presentation) 1998. Friends of Great Salt Lake. 45-90 minutes (see footer).

INTERNET

<http://www.media.utah.edu/ucme>

Encyclopedic information pertaining to Great Salt Lake, Lake Bonneville, etc.

<http://www.xmission.com/~fogsl>

Friends of Great Salt Lake Web site featuring events, issues, information

<http://www.dutslc.wr.usgs.gov/greatsaltlake/saltlake.html>

US Geological Survey maps, lake elevations, science, ecology, photos and more

<http://www.geog.utah.edu/~jhipg/gslmod/gslhome.html>

Westminster College: on-line learning module and virtual field trip

CONTACTS

Antelope Island State Park 801/773-2941

BarTen Company Great Salt Lake Information Catalog 801/972-7054

Great Salt Lake State Park 801/531-8102

Saltair Resort 801/250-4400

Salt Island Adventures (Lake Cruises) 801/583-4400

US Geological Survey Earth Science Information Center 801/975-3742

Utah Geological Survey 801/537-330 (general); 537-3320 (map sales)

Utah Dept. of Natural Resources, Division of Wildlife Resources 801/538-4700



Board Elections and Bylaw Revisions

The October 27th general meeting is the time for the Friends' Board of Directors elections. This year, a change in the by-laws of the organization will also be placed on the ballot.

The officer positions are elected every year. General board member positions are two year terms. This year, six officer positions and four general board member positions are to be voted on. However, in the event that the by-laws revision is passed, (see below) only four officer positions will be filled.

The following are the candidates and the offices they seek.

President

Lynn de Freitas. Having completed her first year as President, Lynn is looking forward to strengthening the educational activities and focusing on the issues that threaten the ecosystem. She is concerned about urban growth and wants to be looking closely at the upcoming Great Salt Lake Plan as well as being a catalyst for establishing a comprehensive watershed management plan.

Vice President

Margy Paul-Hus. Margy is committed to Friends and an advocate of our recycling program and the Adopt a Highway cleanup. As Vice President she would be the chair of the membership committee which recruits members and updates the membership data base.

Treasurer

Spencer Martin. "Meticulous and responsible" are requirements for the treasurer's position and Spencer has proven his worth this last year. He understands the important niche in the community that Friends hold to protect the Great Salt Lake ecosystem.

Secretary

Michele Davis. Volunteering for a worthy cause and helping others are the motivations for Michele in seeking re-election. She has found that she has learned much about Great Salt Lake on field trips and even in board meetings as she listens to other lake enthusiasts.

The following candidates are seeking general board member positions.

Ann Dick. The future of Great Salt Lake and threats to maintaining a viable ecosystem is the foundation for Ann's dedication to Friends. She sees Friends as a resource which provides information about the Lake and ways to protect it. She is currently working on a Great Salt Lake curriculum for the Utah Natural History Museum's Junior Science Academy that will reach 4th graders in Salt Lake valley.

Lindsey Oswald. After working as an intern for Friends on the 1998 Issues Forum, Lindsey wanted to get further involved with the issues threatening the Lake. She is an enthusiast of mountain and desert regions and realized that Friends provides an opportunity to add another ecosystem to her knowledge. "Besides that," she says, "it's so much fun!"

Catherine Quinn. After years of supporting Friends in other ways, Catherine now feels she can devote some time to the duties of a Board member. She has extensive knowledge of the Lake's ecosystem, planning, and resource management.

When Friends adopted their by-laws in 1994, the Board of Directors consisted of 15 members, 6 of whom were officers. The officer positions included the President Elect, President, Past President, Vice President, Treasurer, and Secretary. The President Elect served a one year term in anticipation of becoming President the following year. The Past President served a one year term after being the President. The Board found that the President may need more than one year to fully grow into the position. Thus, the Board is asking the membership to eliminate the President Elect and Past President positions and to allow the President to seek re-election for more than one year's term. The total number of Board positions would be 13.

Term limits are also vague and confusing in the original by-laws. The Board is asking the membership to consider a term limit of a total of six years for any combination of years served as an officer or general board member. After six years, a one year retirement from the board is required before seeking re-election.

A yes vote on these issues will allow the Board to be more effective and efficient in upholding the mission of Friends

The Case Against the Legacy Highway

See the WWW page: <http://stoplegacyhighway.org>



Friends of Great Salt Lake 1998

BOARD OF DIRECTORS

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ldefreitas@earthlink.net

Joel Peterson - Past President
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Michele Davis - Secretary
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Kevin Landis - activity organizer
972-7054

Reda Herriott - newsletter editor
435-425-3966 RedaHZ@Wasatch.com

Lynn LeMaster - monthly flier
294-4517

ADVISORY BOARD

Bob Adler

Genevieve Atwood

John Kadlec

Dick Nourse

Steve Simms

Ella Sorensen

Terry Tempest Williams

Wayne Wurtsbaugh

Recycle Aluminum Cans.

Please consider donating aluminum cans to Friends. Can donations will be accepted at 1149 E. Browning Avenue Saturdays between 9 a.m. and 2 p.m. All proceeds will go to the FOGSL general fund. Cans must be contained in plastic garbage bags.

If you have cans to donate, but can't transport them, please call Margie Paul-Hus and arrangements will be made for a pick-up. If you don't recycle aluminum, please consider starting!! This will greatly benefit Friends. Volunteers are needed for accepting aluminum cans in your neighborhood and/or taking cans to the recycling center.

Questions, please call **Margie Paul-Hus at 487-4383.**

Submitting Material for Publication

1. **What To Submit:** original articles (historical, geological, geographical, biological, political, fiction, poetry, etc.) which pertain to Great Salt Lake or art work including sketches, photographs, etc.
2. **Submitting Material:** Mail or deliver to 2656 S. Chadwick St. SLC, UT 84106-3506. Or e-mail to jzinanti@wasatch.com or RedaHZ@wasatch.com
3. Please phone 484-5799 to confirm receipt of e-mail, or with any other questions, suggestions, comments, or ideas
4. **Deadlines:** The deadlines are Sept. 16 (Fall), Dec. 16 (Winter), Mar 16 (Spring), and June 16 (Summer).

Friends of Great Salt Lake wishes to thank Xmission.com for its generous donation of services to support the Friends of Great Salt Lake on the World Wide Web
<http://www.xmission.com/~fogsl>
Kevin Landis: webmaster



The Greater Salt Lake Ecosystem: An Online Learning Module and Virtual Fieldtrip

by Robert E. Ford, Associate Professor, International Studies Westminster College of Salt Lake City:
rford@igc.org Tel. 801-488-1655 (office)

Over the last three years Westminster College has participated in a NASA-funded project known as ESSE (Earth System Science Education). The goal is to stimulate and test new "interdisciplinary and integrative" approaches to earth and environmental science education. I also am involved with another NSF (National Science Foundation) project called the VGDP (Virtual Geography Department Project). The latter is based out of the University of Texas-Austin and has the objective of developing and sharing geographic information and curriculum material on a world-wide basis with an entire discipline--geography.

Both projects have provided training in how to share our new teaching resources and experiences via the Internet with students and faculty across the US and the world. There are about 40+ collaborating universities in the ESSE consortium and the VGDP reaches thousands of teachers and students.

Most of the material we've created fits into a "liberal education" course entitled: Earth Systems and Global Environmental Change. It is also used in several regular biology and physical science and geography courses. What better place to consider some of the many issues in global as well as local environmental change, than what is happening in the Greater Salt Lake Ecosystem Region.

Several of us involved in this effort have begun to create "virtual laboratory" experiences and field trips that can be used in two ways. First, to allow students to visit the site BEFORE they take a real trip. The purpose is to increase the quality of the field experience and to enhance what they remember afterwards. As an instructor I find that doing this allows me to focus my limited time in the field doing more observation and "hands-on" work rather than "lecturing". And, secondly, for those who cannot ever go to the Great Salt Lake--they also can have "the next best thing" which is a "virtual" experience. A colleague of mine in Wisconsin, for instance, has created virtual trips dealing with continental glaciation that I use very effectively.

We also have another wider goal and hope. By putting our teaching material "out there" for everyone to see, use and improve upon, we anticipate that the learning will take on more relevance and practicality and will be kept more up-to-date. Maybe, for instance, students and community organizations--such as the Friends of the Great Salt Lake--can in this way become partners with us in the educational process. At this point, this is only a theory and idea. Do you think it might work? Please let us know.

Finally, this is very much an evolving product and we welcome your input and suggestions for improvement. Please feel free to contact Robert E. Ford or Ty Harrison--both involved with the science program at Westminster College--to give your feedback. You can find the virtual fieldtrip at the following URL:

http://www.wcslc.edu/pers_pages/r-ford/GSL/index.html

If you want to visit the ESSE project go to: <http://www.usra.edu/esse/ESSE.html>

The VGDP project is found at : <http://www.utexas.edu/depts/grg/virtdept/contents.html>

Denise Brown Art Print Cards

If you enjoyed the cover of our Winter 1998 newsletter, or if you would just like to have four beautiful and inspirational artist's views of our "Great Salt Lake". Please order some cards. Denise Brown is graciously donating all of the proceeds (above printing cost) to our organization. Friends of Great Salt Lake receives a generous dollar amount from each card pack you purchase and you receive some beautiful cards.

Card packs:

\$14.00 for 8 Cards

\$7.00 for 4 cards

(Choose sets which are all same or a mixture.)

To order box(es), Mail to:

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2656 S. Chadwick Street

Salt Lake City, Utah 84106

(484-5799)

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Cards will also be available at all
General Meetings.





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<http://www.xmission.com/~fogsl>

Yes! I want to join FRIENDS of Great Salt Lake.

Here are my dues in the amount of (check one):

- \$10 Student Membership "Brine Fly"
- \$10 Senior Membership "White Pelican"
- \$20 Regular Membership "Pickleweed"
- \$30 Family Membership "Wilson's Phalarope"

Contributing Memberships:

- \$31-50 "Brine Shrimp"
- \$51-100 "Eared Grebe"
- \$101-250 "Pronghorn Antelope"
- \$251-499 "Bald Eagle"
- \$500 Sustaining "Ecosystem Protector"

Student - be at least half time.

Senior - must be 62 years or older.

Sustaining is any corporation, institute, organization, or individual interested in financially supporting activities of **FRIENDS OF GREAT SALT LAKE**

(v4n4)

In addition to my dues, I would like to make a tax-deductible contribution in the amount of

- \$10
- \$25
- \$50
- \$100
- \$250
- other _____

Please make check payable to
FRIENDS OF GREAT SALT LAKE

Mail To

FRIENDS OF GREAT SALT LAKE
 P.O. Box 2655
 Salt Lake City, UT 84110-2655
 (phone 801-582-1496)

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CITY/STATE/ZIP:

PHONE:

MY SPECIAL INTEREST IN THE LAKE IS

