

FRIENDS of *Great Salt Lake*

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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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Spring 2001 Calendar of Events



April	24	Tuesday	General Meeting 7 PM Jeff Salt "Jordan River Education" (to be held at the Ogden Nature Center. To get there: take I-15 North to the Ogden 12th St. Exit and continue east through 2 traffic lights. After the second light on the left you will see the banner for the front gate of the Ogden Nature Center.)
May	3	Thursday	Board Meeting
May	12-19		Third Annual Great Salt Lake Bird Festival (see article p. 4)
May	22	Tuesday	General Meeting 7 PM Holly Godsey Bennett "Geoantiquities of Great Salt Lake: A Natural Record of Earth History" (see article on p. 6)
June	1	Thursday	Board Meeting
June	27	Tuesday	General Meeting 7 PM to be announced (watch our website)
July	5	Thursday	Board Meeting
July			No General Meeting
August	2	Thursday	Board Meeting
August			No General Meeting

Watch the local papers for announcements of speakers and topics at our General Meetings, or call our hot-line at 801/583-5593, and press 1 for monthly activities. NOTE: General Meetings are held at the Sugarhouse Garden Center, located in the northeast corner of Sugarhouse Park, 2100 South 1300 East in Salt Lake City. Board Meetings are held at the Salt Lake County Complex on State Street and 2100 South in Salt Lake City. Room S3009

Cover: *Pelicans* photograph by Gary Crandall

President's Message: Seeking Great Salt Lake in the Utah State Water Plan

"Human beings were invented by water as a device for transporting itself from one place to another."
—Tom Robbins

It's now all water under the bridge, but, last October, everyone was invited to comment on the draft of the Utah State Water Plan: Utah's Water Resources; Planning for the Future. Prepared for the people of Utah under the direction of the Board of Water Resources, this bite-sized 70 page document provided the reader with 8 handy chapters of information that ranged from an introduction to water resources in Utah to a conclusion on how to put the pieces together.

A series of public meetings were held around the state to solicit input on the draft and the Plan was even available online for the convenience of many. All applaudable efforts by the Division of Water Resources to provide opportunities for all of us to participate in the process. Admirably, the Plan states that, because water has been made so easily available, we have a tendency to forget that we're living in a semi-arid climate (less than 14 inches of precipitation annually). The Plan also suggests that if we are going to meet the future needs of our ever-growing state we need to promote effective water conservation and water management strategies and carefully planned water development.

Going straight for the jugular, I checked the index for listings on Great Salt Lake. Much to my chagrin, the only reference was on page 54. Less than one third of the page mentioned the importance of wetlands in general and acknowledged that approximately

50% of the state's wetlands were located around Great Salt Lake. And that "recent opposition to the state's plan to expand the state highway infrastructure (Legacy Highway, perhaps?) through these wetlands is evidence of the conflict between wetland preservation and future infrastructure development." And that was it!

The irony here is that nothing was mentioned about the state's responsibility to sustainably manage the Great Salt Lake Ecosystem in perpetuity, as a public trust resource for all Utah citizens. There was no reference to the Great Salt Lake Management Plan that was born out of nearly two years of citizen input and Department of Natural Resources time and energy. Nor was the Lake included anywhere in the discussion about developing the Bear River, Great Salt Lake's largest inflow source. I realize that there are many people who believe that any water that flows into Great Salt Lake is "wasted" but ignoring the connection between how the state is planning for the future of our water resources and the perpetuity of the Great Salt Lake Ecosystem is irresponsible.

Yours in saline,
Lynn de Freitas

Lake Fact:

How many rivers bring water directly into Great Salt Lake, and what are their names?

3rd Annual Great Salt Lake Bird Festival Is Drawing Near

By Sander Lazar, Barbara L Tanner Fellow

This year's Bird Festival promises to be bigger, better, and birder than ever before. With tours and workshops throughout the entire week of May 12th-19th there's no excuse not to participate. Tours filled up to capacity last year, so this year we're offering more tours, and all mid-week tours will be absolutely free.

The big day, Saturday the 12th, will start with a bang when we host the early-morning Fun/Run/Walk/Ride starting at 7:30 a.m. at Antelope Island State park. The rest of the action will take place at the Davis County Fairpark, where all are invited to take part in workshops and tours of the local wetlands to learn more about a myriad of subjects concerning the birds and our Great Salt Lake. There will be something for everyone, from a Northern Utah Wetland Partnership Youth Field Trip to Wildlife Photography at Farmington Bay. There will be workshops for budding



Avocet, 'Official' Bird of the Festival

birders, and for you expert birders, thanks to your input at last year's festival, this year we will be supplying more expert birding workshops and tours. And if birds aren't your thing, you can take one of our workshops on Desert Tortoises and Snakes!

All day long from 8:00 am through 6:00 pm there will be live entertainment, artists and vendors, food and exhibits. We invite you to make a day of it, bring your friends, family, grandchildren, or grandparents. The evening festival dinner will feature keynote speaker

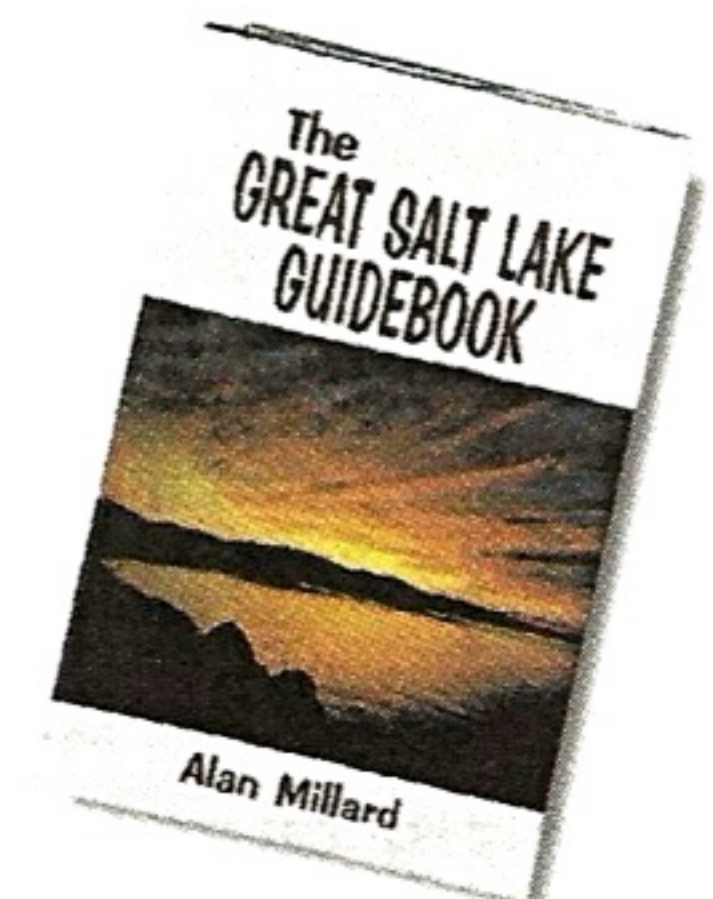
Terry Tempest Williams, whose speech, "Refuge, Looking Back and Looking Forward," is sure to stir the hearts of anyone attending.

The 5-million birds that live at or visit the Great Salt Lake annually are celebrating! Don't you think it's high time we joined in on the fun? 🐦 see p. 11 for schedule

New Great Salt Lake Publication

It is always encouraging to see efforts being taken to create or draw upon public interest in Great Salt Lake. This latest entry is from Bountiful's own Horizon Publishers. Written by former Antelope Island State Park ranger, Alan Millard, The Great Salt Lake Guidebook is divided into four parts: History, The Great Salt Lake Ecosystem, Nature's Handiwork, and Materials For Teachers. The text is enhanced by black & white photos, maps, charts and resource lists. Millard offers some fresh facets of information and a format and scope different enough from previous works as to deserve inspection. There is even a 40-question "quiz" in the back. Many just getting to know the Lake should find this a worthy introduction.

The Great Salt Lake Guidebook. \$9.98. Paperback, 126 pgs. Horizon Publishers, Bountiful. 801/295-9451. <http://www.horizonpublishers.com>

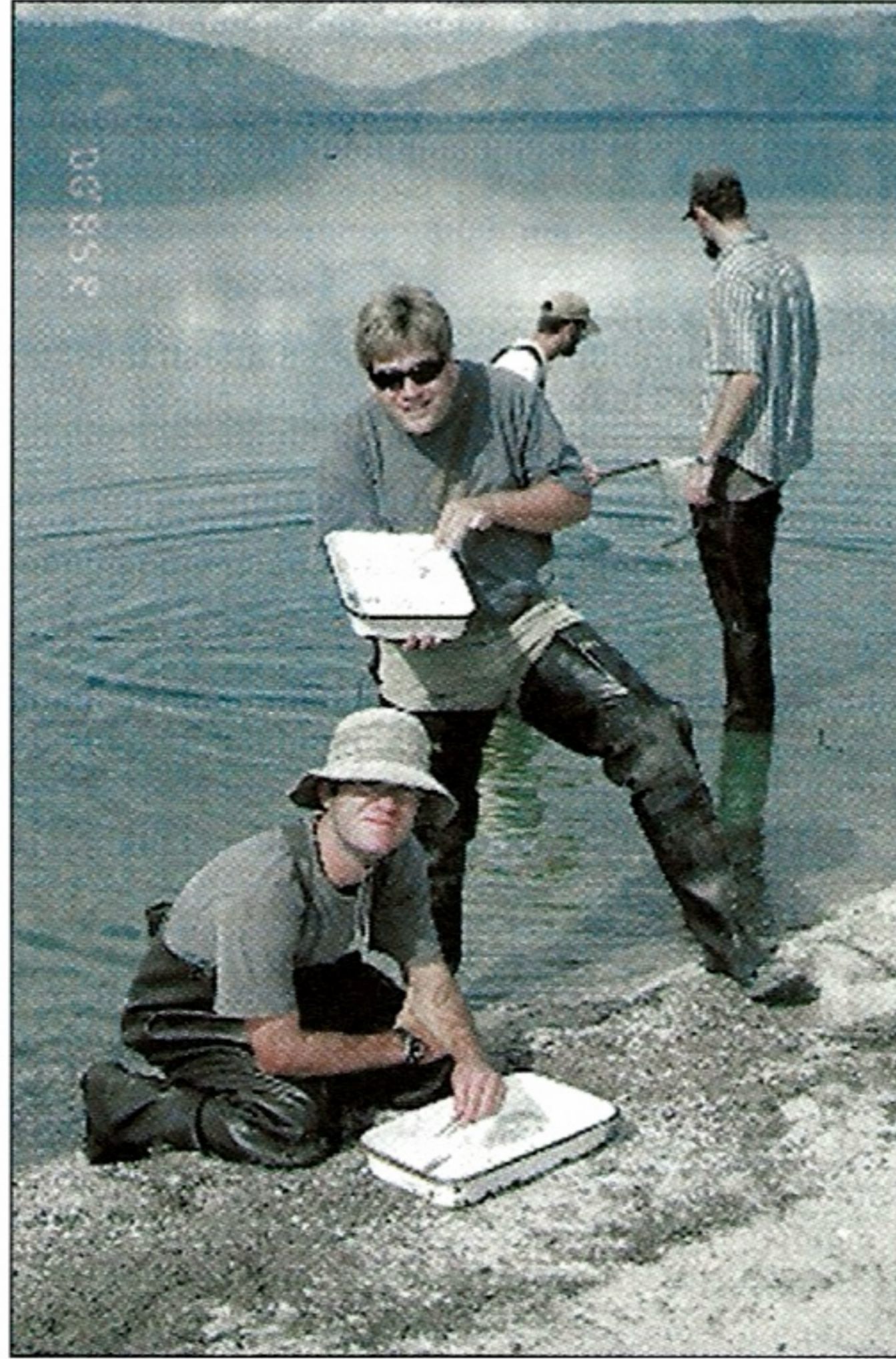


The Great Salt Lake Doesn't Stink... But Farmington Bay Does!

By Amy M. Marcarelli, Michael D. Mills, and Wayne A. Wurtsbaugh

Standing on the causeway to Antelope Island, many things are striking...the beauty of the sun over the lake, the incredible serenity of the landscape...the stifling odor coming from Farmington Bay. The causeway, which was first constructed in 1969 and then rebuilt in 1993, serves as the only entrance to Antelope Island. It also serves as a barrier between Farmington Bay estuary, where the Jordan River flows into the lake, and the rest of the Great Salt Lake. Our research, both through the mid-1990s and more recently in October 2000 has illustrated many differences between Farmington Bay and the southern basin (Gilbert Bay) of the Great Salt Lake. We believe that many of the differences we found are due to high levels of nutrient input into Farmington Bay from the Jordan River and sewage treatment plants along the shore.

The most striking difference between the basins is the productivity. Farmington Bay supports very high densities of algae, while the Great Salt Lake (Bridger Bay) has much lower concentrations. Water transparency, measured by determining the depth a white Secchi disk disappears from view, was shallower in Farmington Bay — 0.6 m compared to 1.8 m in the Lake proper. This indicates that Farmington Bay has higher algal densities and growth. We also used chlorophyll a concentrations as a measure of algal biomass. In Farmington Bay average chlorophyll concentrations ranged from 11 to 70 g Chl. a L⁻¹ during our 1994 survey, and in 2000 there was 42 g Chl. a L⁻¹ (Fig. 1). Even higher concentrations have been measured at the south end of Farmington Bay near the discharges of the Jordan River and a sewage canal (UWRL 1988). In contrast, averages in the Great Salt Lake proper were between 0.2 and 12 g Chl. a L⁻¹ in 1994 and there was



Students in FW4510 class sampling invertebrates in Farmington Bay.

PHOTO BY WAYNE A. WURTSBAUGH

only 5 g Chl. a L⁻¹ in 2000. When classified according to these values, the Great Salt Lake is placed into a category of lakes known as mesotrophic, while Farmington Bay is classified as hypereutrophic. Oligotrophic lakes have low nutrient inputs and low algal densities, while hypereutrophic lakes have excessive nutrients and algae. Mesotrophic lakes fall somewhere in between. When the productivity in a lake increases due to increased nutrient loading from the surrounding environment, it is said to undergo cultural eutrophication, or a shift to a more productive trophic state. The chlorophyll levels in Farmington Bay indicate that it is undergoing eutrophication, most likely due to nutrient inputs from the Jordan River and other development surrounding the bay.

A further difference between Farmington Bay and the Great Salt Lake proper is the composition of the plankton community. In October 2000 the community in the Great Salt Lake was dominated by green algae, in particular *Spermatozopsis* spp., while the community in Farmington Bay was more diverse (Fig. 2). It was composed mainly of diatoms, particularly the diatom *Nitzschia* spp., but also contained large numbers of the filamentous cyanobacteria *Spirulina* major. Photosynthetic cyanobacteria are notorious indicators of eutrophication. They are also well known for the often overwhelming, unattractive, and foul smelling blooms they can produce in polluted water. Noxious odors and blooms are detrimental to tourism and general usage of the lake. We did not find any cyanobacteria in the Great Salt Lake proper, although they have been found there when salinities are lower.

'Farmington Bay' continued p. 13

Savoring the Great Salt Lake

By Maurine E. Haltiner

Only someone who hasn't walked
the briny edges of your shore, galloped
barefoot down slopes of eggstone sand,
felt the sting of salt from wind-scuffed waves,
bathed buoyant under scarlet sunsets, watched a single
white pelican rest on blue water or one willet stretch
barred wings in abrupt escape, white-black, white-black,
white-black, in rhythm with its call,
would think you a remnant,
a relic,
leftover like
a shard
of castaway pottery.

Bonneville, is in you,
not the reverse. Though heavy,
compressed, salt secure, you are not
a Dead Sea. You teem with algae-laden life. New
miracles abound. A blue heron, stone still,
iridescent in sunlight, replaces Lot's wife,
antiquated pillar of salt, insult to love.
Overcast skies glaze and blur the horizon, levitate
distant islands,
Bird, Egg, Dolphin, Strongs Knob,
transform them
into rollicking, airborne hatcheries.
Stilted avocets stitch webbed patterns
in margins of salt lace while
coots dip in unison appetite.
Offshore, near strands of floating gulls, tipped
and toppled by ripples of water, a curved
neck disappears. Underwater,
a topsy-turvy bill scoops
mouthfuls of shrimp, full testament
to unclipped wings
to a whisper
of flamingo
pink,
Floyd.

Geoantiquities: Natural records of Earth history at risk in the urban environment

By Holly Godsey Bennett
and Marjorie A. Chan
Dept. of Geology and Geophysics,
University of Utah, Salt Lake City

Geoantiquities are natural landscapes that preserve
the Earth's recent geologic and environmental history.
Landscapes such as glacial moraines, lake shorelines, deltas,
beaches, salt flats and marshes record processes that occur at
the Earth's surface and provide valuable information on how
these processes interact and evolve.

Utah's Bonneville basin contains excellent examples
of Geoantiquities such as prominent shorelines, sandbars
and spits that formed in ancient Lake Bonneville about
29,000 to 15,000 years (24,000-12,700 radiocarbon years)
ago. Because many of these features are composed of
loose, unconsolidated sediment they are susceptible to
destruction by removal or burial, particularly in areas of
rapid urban growth.

The importance of geoantiquities lies not only in their
scientific value but also in their potential to serve as
educational tools for future generations. Geoantiquities
can also act as natural buffer zones for environmental
hazards and provide open space in a rapidly growing
urban landscape. The future of geoantiquities depends
upon the actions of the scientific community and an
informed citizenry. Our research strives to promote
informed management of geoantiquities through scientific
study and community-wide distribution of knowledge. 🇺🇸



PHOTO BY A. WELLER

Rock Walk (along the shoreline trail, towards Bountiful.)

April

By Amy Brunvand

In April at the Bear River Migratory Bird Refuge, the white pelicans have grown horns on their beaks because it makes them look so sexy to other pelicans. They look as big as airplanes, circling in the updrafts. When they splash down in the water it seems like they must be made of metal, but when they bob up to the surface it's apparent that they can't be any heavier than Styrofoam. They float along in clusters of five or six, and all together now, they dip their heads under water to make a fishing net for brine shrimp. The coots are black with white bills and when they are swimming they look like little fat ducks with stubby beaks. Then they wade to shore and they turn out to be chubby black ducks on stilts. The avocets are the most graceful of all possible birds and everything on them is stretched long and thin. The gaudy mallard ducks are so plump and clumsy next to these elegant wading birds! The grebes are in love. They are as elegant and streamlined as antelope, and they even have a jaunty black racing stripe. They rub their necks together and then slip down under the water's surface and disappear. The yellow-headed

blackbirds sit in rows on a fence. One by one, they pop up to catch a bug out of the air. They are exactly the same color as the big yellow bulldozer that has been pushing up dikes, and few of them are perched on the roof to show off how well their feathers match the machine. Down in the grass there's a speckled pheasant with a ruby red head, and up in the grass there are two gray sandhill cranes with necks like dried reeds. Marsh hawks cruise along the ground with the tips of their wings flipped up in the fashionable raptor style. There's a flock of dowitchers standing on one leg in shallow water above their own reflections and the reflection of the cloudy sky. And all around are snowy mountains and gentle raindrops and rays of sunshine, and the breeze smells like salt, and everywhere there are birds with voices like accordion reeds.

Last Spring, I visited the Bear River Migratory Bird Refuge for the first time (and I've lived in Salt Lake City most of my life). It is, in a word, amazing! After my visit, I wrote this description to try to describe how amazing it is to be among unimaginable numbers and varieties of birds. 🐦



Celebrate Earth Day in Utah



Utah Society for Environmental Education (USEE) will once again host Utah's premier Earth Day Celebration on Saturday, April 28, 2001 at Gardner Village. Join USEE and their fabulous partners for a day of fun and festivities celebrating the Earth and learning how individuals can reduce their personal impact on the environment. We will kick the day off with an educational and invigorating Family Earth-Walk along the Jordan River. During the event you can peruse the educational booths staffed by environmental organizations from throughout the state, or challenge yourself on the climbing wall. For

all the kids at heart, there will be a kids' yard with active games and environmentally friendly crafts. Don't miss exciting environmental displays such as the Ecotryke, a revolutionary new way to get around town! Prizes for contests, and mouth-watering food from Urban Bistro will be popular features. And of course the event would not be complete without the live tunes of various local bands, such as our own favorite Samba Gringa. The event is free and will run from 10 am until 4 pm. Gardner Village is located in West Jordan at 1100 West 7800 South. For more information contact USEE at 801-328-1549, or tudd@usee.org.

Great Salt Lake Islands: Novel Ecosystem Laboratories

By Dwayne W. Meadows

Department of Zoology Weber State University, Ogden



Frary's Creek
- Antelope Island



Caloparyphus
- aquatic
soldierfly larvae



Argia - narrowing
damselfly larvae



Agabus
- A predacious
diving beetle larvae

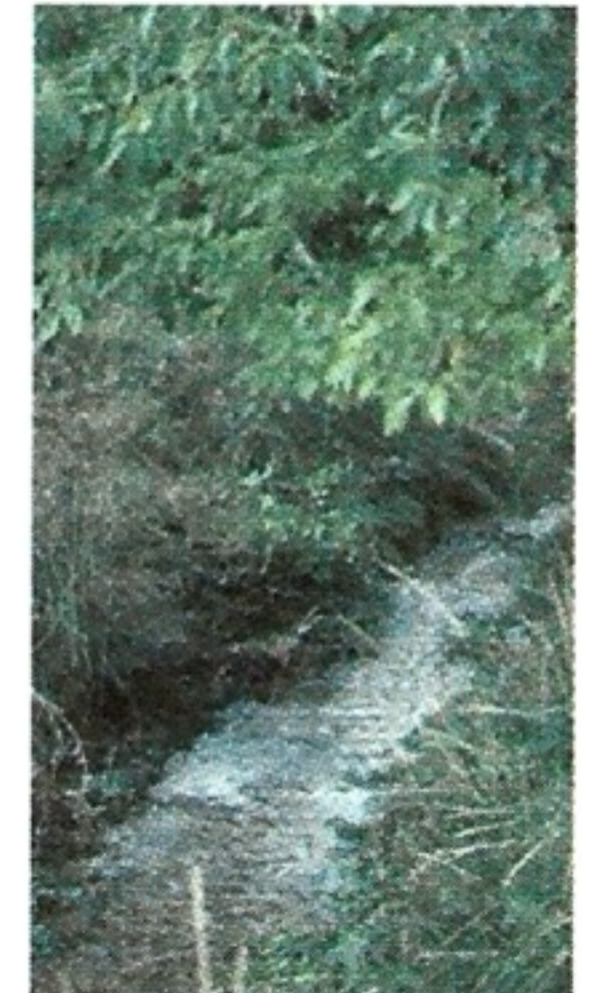
The Great Salt Lake is well known as a unique saline ecosystem with diverse geology and wetlands that provide important aquatic habitat for birds, wildlife, brine shrimp, brine flies, and various microorganisms. Supporters of the lake have done a great job making the wider public and policy makers aware of the importance of the lake ecosystem. Less widely appreciated is the biological significance of the islands created by the lake. Biologists know that islands in general are special ecological and evolutionary laboratories. In fact, on his round the world voyage, Darwin realized that islands are places where species can rapidly evolve because of the isolation of populations and the variety of open niches available to early colonizing organisms. As a result, island groups often have closely related species which differ in small, but sometimes significant, ways from island to island. For example, Darwin recognized different species of tortoises on each of the Galapagos Islands and today we name the related group of finches found on these islands as Darwin's finches. Furthermore, we know that on the same island a single species can evolve into many new species, each occupying a different niche.

The islands of the Great Salt Lake are no exception to this pattern. Depending on water depth, the lake has up to 8 islands (Antelope, Stansbury, Fremont, Carrington, Gunnison, Dolphin, Bird and Badger in order of size). The islands have been isolated from the mainland for long stretches of time during the thousands of year history of the lake. Studies over the

years have shown that new types of organisms have indeed evolved on the islands. For example, subspecies of Valley or Botta Pocket gophers have evolved on Antelope Island (*Thomomys bottae nesophilus*) and Stansbury Island (*T. b. minimus*) that differ from the mainland species. Unique subspecies of Chisel-tooth kangaroo rats evolved on Dolphin Island (*D. microps russeolus*), Gunnison Island (*D. m. alfredi*), and Carrington Island (*D. m. subtenuis*). A subspecies of deer mouse (*Peromyscus maniculatus inclarus*) lives only on Fremont Island while a subspecies of desert wood rat (*Neotoma lepida marshalli*) only occurs on Carrington and Stansbury islands.

I have researched freshwater communities on Antelope Island, the only island with significant freshwater ecosystems, for a number of years. The island has over 80 springs and seeps which give rise to many perennial streams and ponds, especially on the east side of the island. The chemistry of the fresh water of the island is distinct. Rainwater and snow melt that seep into the groundwater are trapped in pockets that extend beneath the island. This water is high in sodium, chloride, and sulfate relative to waters from under the lake itself or mainland areas, with which it does not mix. Moreover, there are actually three chemically very different types of freshwater found on the island.

My students and I have sampled 8 streams and 7 springs or ponds on the island. We found over 65 species of freshwater invertebrates that live in these



Garden Creek
- Antelope Island



Peltodytes
- crawling water
beetle larvae



Trepobates
- a water strider



Enochrus
- water scavenger
beetle larvae

'Islands' continued p. 13

The Behrens Trench

By Peter Behrens, formerly President of Great Salt Lake Minerals Corp.

The Behrens Trench is a 21 mile long excavation on the bottom of the Great Salt Lake, designed as a conveyance for brine.

Extraction of minerals from lakebrines is very energy efficient if solar ponds are used. This technique requires large flat areas with nearly impermeable soils. Great Salt Lake Minerals, now IMC Kalium Corp., started in 1968 with a pond system of about 1,3000 acres in the Bear River area between Little Mountain and Promontory. At this time, the North Arm of the lake had a higher concentration of minerals and was more stable in salinity than the South Arm. Therefore, feedbrine was pumped from the North Arm at Pump Station 1 (PS 1), west of Promontory just north of the causeway. An 8 mile canal transferred the brine to the pond system.

Production capacity is determined by three main factors: area, evaporation rate, and feedbrine concentration. Optimistic assumptions about evaporation rates, partly based on the weather as recorded as average but reflecting the period 1930 through 1960, caused production to be lower than required for profitability. From today's viewpoint, that was the period with the lowest precipitation since the pioneers arrived. As a result, an expensive lesson was learned by GSL Minerals. That lesson was not to believe in "Averages" and so called "Established Trendlines".

Ponds were expanded to 1,9000 acres. With the wet weather starting in 1982, Great Salt Lake rose, and with the 1984 railroad causeway breach, and the untimely termination of the West Desert Pumping Project (WDPP), which caused a loss of about 15% of the lake mineral content, the feedbrine became too diluted for economical operations.

To protect jobs and investments, drastic action was required to maintain an economic base for Great Salt Lake Minerals. Since expansion in the Bear River Bay area was impossible due to environmental concerns, the only practical alternative was to expand elsewhere on the Lake. Areas at the Lake's west shore, between Lakeside and Fingerpoint, became available for leasing. But in order to use the area, an efficient transportation mode for either solid minerals or concentrated brine had to be developed. Solid mineral transportation was immediately ruled out as too expensive.

After the 1984 causeway breach, State agencies undertook an extensive sampling program to determine the

behavior of brines as they flowed bi-directionally through the breach. After an early brief period of sampling in one foot depth intervals showed no heavy brine at the bottom 500 feet south of the breach, I requested resampling from the bottom up in three inch intervals because I believed that heavy brine should be measurable there. My intuition was correct. The samples showed heavy brine flowing south in a defined layer only a few inches thick. This was an indication that the heavy brine could flow underneath lighter brine on a very flat slope without diluting.

Great Salt Lake Minerals had experience with a short intake canal at PS 1 which drew brine from the lower strata of a temporarily stratified North Arm. These observations led to the first layout and cost estimate for a trench that would connect the westside ponds over 21 miles with PS 1. (The design proved to be easier than convincing bankers of the feasibility of construction and operations.)

Extensive calculations of hydraulic parameters were made by Dr. Eckhoff, formerly a Professor at the University of Utah for Civil Engineering, and had also designed the WDPP. A computer model was developed to determine characteristics of such a canal under various conditions.

From the westpond, the first 8 miles of the lakebottom slopes downward, and the problem was to keep flowspeed below a certain level to avoid turbulence. The next 10 miles were on the horizontal lakebottom and speed and excavation had to be optimized. For the final 3 miles, the lakebottom rises to the shoreline and the trench continued downward to Pump Station 1. PS 1 had to be surrounded by a dike and a pipe connected the end of the trench with the pumps. The pipe acts as a siphon to lift the brine about 15 feet to meet the existing pump elevations.

The design ended with the following dimensions: Down slope: 30 feet wide 6 to 8 feet deep, lakebottom: 90 feet wide 6 to 12 feet deep, east end: 55 feet wide 12 to 50 feet deep and total excavations of 3 million cubic yards. Flowtime from west to east takes 6 to 7 days, and the brine volume in motion is 1.5 million tons flowing at a rate of 90 cubic feet/second or 180 acre feet/day.

The driving force is the density difference between the concentrated brine in the trench and the brine above varying between 0.02 and 0.04, and the slope of the halo-

'Trench' continued p. 13

The Lake Affect: Living Together Along The Shores Of Something Great

These live-narrated group presentations are now available to all age groups throughout the Salt Lake Area.

Fascinating re-Discovery of Life and Living in Utah
through the natural and cultural history of our own Great Salt Lake:

Who benefits from Great Salt Lake?

How Does Great Salt Lake Function?

What Is Great Salt Lake's Past, Present and Future?

Why is this giant body of water so important to us all?

Whether we perceive it or not, Great Salt Lake affects all of us who live in or visit the area. This program celebrates the biological, economic, and recreational attributes of the western hemisphere's largest saline lake. Featuring the work of more than 30 area photographers, this dramatic color slide-based experience introduces the wealth of interrelationships, interdependencies, and diversity among humans and all life, and between this life and the Great Salt Lake environment.

For schedule information contact Bruce Thompson at 801/467-3240

Place-based education that strikes at the core.

Third Annual Project SLICE: Great Salt Lake Teacher Training Institute

What do

more than 5,000,000 birds,
5,000,000,000,000 brine flies
and 910,000,000,000,000 brine shrimp
know about this 5,000,000,000,000 gallon,
12,000 year-old lake that **you don't?**

Better come find out!

8:30 AM - 4:30 PM Friday-Saturday
20-21 July 2001

Day 1 at Westminster College
Day 2 at Great Salt Lake & Antelope Island

Registration: \$50

No Charge to 4th grade teachers who sign on as
Field Test Teachers for Fall

— Credit Available —

For Registration or Information

Fill out and submit form on back, or
Call 467-3240 or e-mail fogsled@aol.com

enrollment ceiling: 25 teachers

Open to all K-12 Educators

4th Grade Teachers

Discover the whos, whats, hows and whys of Great Salt Lake science education in your classroom. Our materials include lesson plans, not mere stand-alone activities. SLICE enables you to provide your students with prideful standards-based learning about a place that is far more than "big, salty, buggy and stinky."

Field Test Teachers Sought

Twelve 4th grade teachers will be provided the opportunity to Field Test several core-driven units of Project SLICE beginning Fall, 2001. To participate, call now or inquire at the workshop.

Field Test teachers will receive:

- Free Teacher Training Institute enrollment
- Classroom visits from the SpeakersNet
- A classroom video of "The Lake Affect"
- Great Salt Lake study specimens
- Field trip funding and staffing
- Maps, worksheets, transparencies, photos

The mission of FRIENDS of Great Salt Lake is to preserve and protect the Great Salt Lake Ecosystem through education, research and advocacy. The goal of Project SLICE (a Salt Lake Initiative for Conservation Education) is to advance this mission by providing Utah educators an integrated suite of lessons, materials, training and services that unites Great Salt Lake with state core curriculum standards. © FRIENDS of Great Salt Lake rev. 02/15/01

Sponsored by FRIENDS of Great Salt Lake in association with the Utah Museum of Natural History & Westminster College.

Free materials, classroom guests, field trip opportunities, resources, activities are available.

Antelope Island State Park

starts at 7:30 a.m.
Fun Run/Walk/Ride

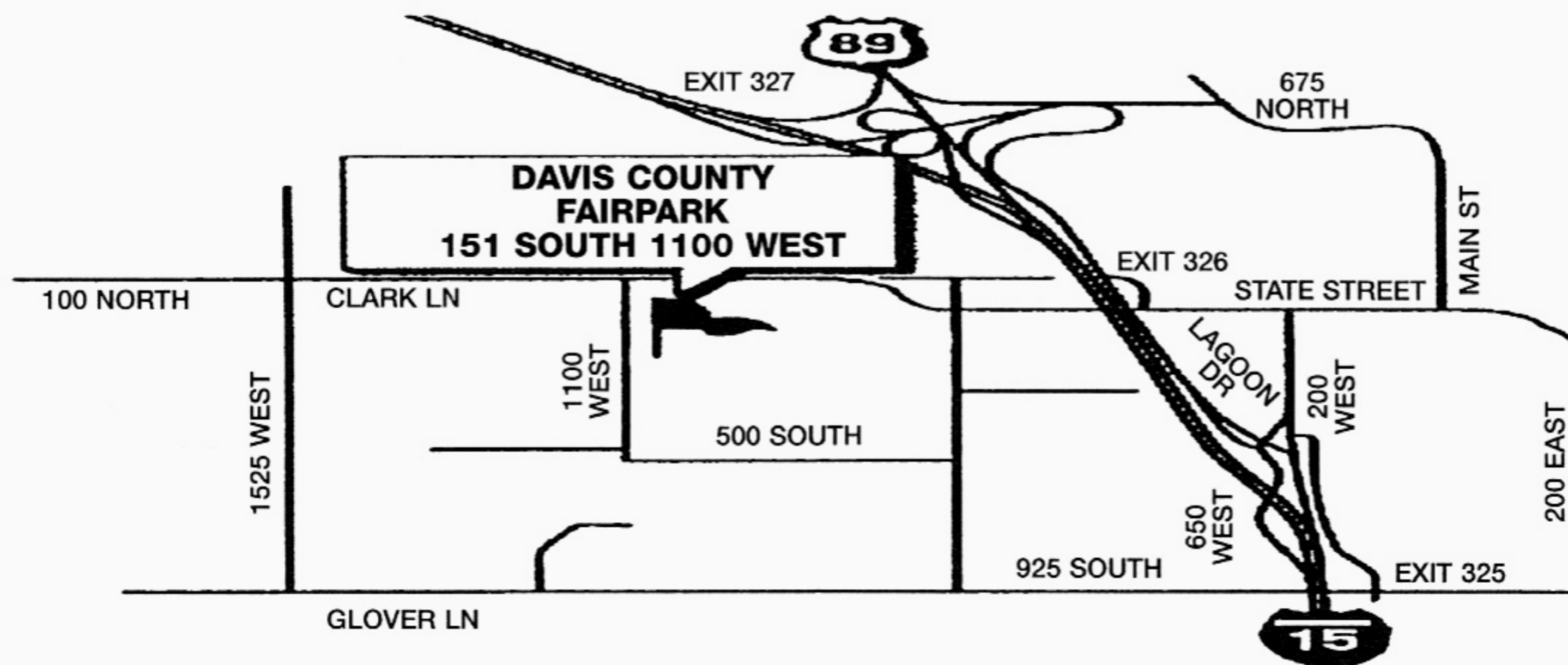
May 12, 2001 Schedule

3rd Annual Great Salt Lake Bird Festival

Davis County FairPark

8 a.m. – 6:30 p.m.
Booths, Displays, Artists,
Entertainment, Food

7:30 a.m. - 8 a.m.	8:30 a.m. - 9 a.m.	10 a.m.	11 a.m.	NOON	1 p.m.	2 p.m.	3 p.m.	4 p.m. - 6:30 p.m.	7 p.m. - 9 p.m.
7:30 a.m.- 11 a.m. Fun Run/Walk/Ride Antelope Island State Park			Northern Utah Wetlands Partnership Youth Field Trip	Lunch with Don Paul Aka Dr. A. Pauling Wilson's Phalarope	Desert Tortoise & Snakes ONC	Northern Utah Wetlands Partnership Youth Field Trip	Field Trip Volunteer Wetlands Monitoring Program	Booths, Artists, Vendors, Food, Workshops, and Entertainment	
8 a.m. Expert Birding Workshops: Gulls, Shorebirds, Flycatchers, Waterfowl	8:30 a.m. Field Trip Expert Birding Farmington Bay WMA	Hawkwatch: Introduction To Predator Identification		Bus & Bird Field Trip Antelope Island State Park				4 p.m. Expert Birding Workshop Gulls	Festival Dinner Keynote Speaker is Terry Tempest Williams Introduced By Ella Sorenson
Birding for Beginners Workshops Lee & Paula Shirley	9 a.m. Field Trip Birding for Beginners Farmington Bay WMA	Harold Youngfield Steps to a Completed Bird Painting		Bus & Bird Field Trip Farmington Bay WMA				4:30 p.m. Expert Birding Workshop Waterfowl	
Wildlife Photography Workshop Jerry Sintz	9 a.m. Field Trip Wildlife Photography Farmington Bay WMA				Birding at Ogden Bay WMA			5 p.m. Expert Birding Workshop Flycatchers	
	9 a.m. Wildlife ER Barb Schneider	Desert Tortoise & Snakes ONC	Desert Tortoise & Snakes ONC	Booths, Artists, Vendors, Food, Workshops, & Entertainment		Exploring Wetlands Field Trip TNC Layton Preserve		5:30 p.m. Expert Birding Workshop Shorebirds	
8 a.m. - 6:30 p.m. Booths, Artists, Vendors, Food, Workshops, and Entertainment Conservation officer, Amazing Outdoors workshop, birdfeeders, Home Depot craft, live birds				Hawkwatch: Raptor Migration & Conservation 21st Century		Desert Tortoise & Snakes ONC	Harold Youngfield Steps to a Completed Bird Painting	6:30 Music & Art Exhibit Before dinner	
10 am – 4 pm PAWS mobile classroom from Bonneville RC&D Hands on learning station about plants, animals, water, soil									



FOGSL Research Committee Comes Alive!

By Heidi Hoven

Well we finally did it! We had our first Research Committee (RC) meeting and have lots of exciting goals to achieve. The RC was officially formed at the Board Retreat of 2000 by Heidi Hoven, Chair, Don Mabey, and Wayne Wurtsbaugh. At that time, we outlined a set of general goals:

1. Facilitate exchange of information among researchers
2. Make the results of research available to interested individuals and organizations
3. Advocate research supported by other organizations
4. Identify and prioritize GSL related research problems needing additional attention
5. Fund research by individuals or other organizations
6. Conduct research programs

Within the FOGSL Bylaws it states “the Research Committee shall review, initiate, support, and, when appropriate, conduct research of the Great Salt Lake and the surrounding ecosystem” so it looks like we have identified appropriate short- and long-term goals. I should note that there is no time limit for meeting these goals!

Don, Wayne, and I realized that achieving most of these goals may take some time so we focused on the first two and tried to assimilate a multi-disciplinary bibliography of lake related documents. Weve been looking into using what other groups have started, but there are certain obstacles that may preclude their use. We envision placing the bibliography (at least annotated) on the web site some day. We also began a dialogue of initiating a FOGSL scholarship for graduate and undergraduate students and decided that we would like to offer it in the name of Doyle W. Stephens.



The year 2001 brought new members to the board and to the RC! We are now joined by Brian Nicholson, and Katrina Moser. We also have an ad hoc RC member, John Files. At this year's Board retreat, we came up with the following goals for this year:

1. Establish an active RC
2. Develop a forum for sharing GSL related research
3. Continue developing a scholarship program
4. Continue developing a bibliography

Well guess what? Weve already acted on the first two goals and are now acting on the last two! Here is what's happening:

With the help of an advisory committee, of which Katrina and I participated, Barbara Bentley (another new Board member) wrote and submitted an NSF proposal for funding a Salt Lake Field Conference. It is likely to be very competitive, but Barbara modeled it after a similar program that she successfully developed for the same funding source. It will probably be six months or so before we hear the results, but if we win, we will host two workshops per year for the next five years for the sole purpose of gathering physical and social scientists, decision makers, students and the general public to share their knowledge and learn new perspective of the lake and its natural resources. What an honor that will be! We will keep an eye out for other funding sources as well.

As another way to reach out to the membership and learn more about the lake and its natural resources, the RC will be hosting exclusive trips to the lake under a program called “Let's Explore the Lake”. This program will focus on current investigations by local or visiting scientists. We envision taking a small group of people so that everyone can actively participate in discussions. We will report on these investigations in subsequent newsletters so that the rest of the membership can learn what we find out on these trips. It could be really fun and think of what we could learn! Look for “Lets Explore the Lake” in upcoming newsletters.

We are working on ways to develop the bibliography and will keep you posted. In addition to the bibliography, we think it would be nice to have a FOGSL library some day - do I hear the start of a Friends wish list?? We are also planning on soliciting seed money to gather funds for the Doyle W. Stephens Scholarship. The scholarship will help supplement research of both undergraduate and graduate students who are conducting lake related investigations. The specific details of how much support and who would receive it is something we will continue to define. For now, however, the focus will be to try to set up an endowment from which we can give on a regular basis. How much we can give will depend on membership and other donations. Who knows — maybe a silent auction will be in the works as a fun way to raise money. Look for notices in future newsletters.

That's it! As you can see, we already have a lot under way and I feel we have the potential to accomplish a lot! The Research Committee is devoted to helping further the mission of Friends and to foster and share research contributions of Great Salt Lake. 🦋

We also examined some physical and chemical characteristics of Farmington Bay and the Great Salt Lake proper. Salinity was higher in the lake, averaging 88 g Chl. a L⁻¹ compared to 65 g Chl. a L⁻¹ in Farmington Bay. These different salinity levels probably contribute to the difference in algal species composition between the basins. The green algae that were found in the Lake proper are much more tolerant of highly saline conditions than the cyanobacteria found in Farmington Bay.

Distribution of oxygen in the water column was also different between the two basins (Fig. 3). In the Great Salt Lake proper, oxygen was constant from the surface to the lake bottom where we measured it. In Farmington Bay, on the other hand, oxygen decreased dramatically, falling to zero in the layer below 2 m (6.6 ft) that is physically stratified because of intruding high-salinity water that underflows from the main lake. This layer occurs in a limited area, because most of the Bay is < 2 m deep. The low oxygen concentration is the result of high levels of algae and other organic matter that settles to the bottom and is decomposed by microbes that use up oxygen in the process. There are distinctly different chemical processes that happen in this anoxic (literally, without oxygen) layer. When we collected samples from near the sediments, the water smelled strongly of rotten eggs, a smell that is indicative of hydrogen sulfide gas. This gas is only present in the absence of oxygen. It is also a smell that often plagues communities surrounding the lake. Decomposing algal mats and anoxic conditions at the sediment-water interface throughout Farmington Bay also contribute to the odor (Israelsen et al. 1985). We have spent many days working on the larger lake and have never encountered foul odors there, indicating that it is the condition that society has created in Farmington Bay that is the problem not the lake itself. In contrast, smells emanating from Farmington Bay can range from mildly pleasing marine aromas to ones that gag you. The DEQ Designated Uses for Farmington Bay are primary and secondary contact recreation, aquatic wildlife, and mineral extraction. When you can taste the odors wafting from the bay, recreational use is obviously deterred, and residents in nearby communities are also impacted. 🐾

'Farmington Bay' will be continued in the Summer issue.



Gyraulus
- a planorbis snail



Hydropsyche
- a netspinner
caddisfly larvae



Stagnicola
- snail

streams and springs (none has fish). These include of course many insect larvae, but also two clams, three snails, an aquatic pill bug, an amphipod (a shrimp relative), and numerous worms. Interestingly, the majority of these invertebrates are different species than the ones found along the nearby Wasatch front. Such a unique and diverse community is significant in its own right. While, I am an ecologist, and thus unqualified to make determinations about whether many of these organisms are new species, some of the species with poor dispersal abilities such as the clams, snails, worms, amphipod and some of the insects could have evolved on the island. A few of our specimens are being examined by taxonomists to make this determination, but much more work remains to be done in this area.

Greater awareness and support of the unique biological opportunities that the islands present are needed however. We can learn a great deal about the ecological factors that lead to the evolution of new species and the features of organisms that make them successful by studying the biota of these islands. We can also learn to appreciate these organisms and try to live with them so that no more of them go extinct as has apparently occurred for the Kangaroo rat on Dolphin Island. 🐾

'Trench' continued

cline created by the action of the pumps at PS 1. (The halocline is the surface of a layer of heavy brine as it touches the upper brine. The halocline separates the moving brine in the trench from the upper brine). The slope of the halocline is about the same as the slope of the bottom of the trench.

The trench has now operated for 8 years and met with the expectations. That is, the volume of the brine flowing and the rate of dilution due to mixing with upper brine are as expected during the engineering. A total of \$15 million had to be spent to compensate for feedbrine dilution caused by weather and government actions, in order to keep Great Salt Lake Minerals economically viable. 🐾

HOW TO REACH US

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RECYCLE ALUMINUM CANS FOR FRIENDS (please note new drop-off location)

Please consider donating aluminum cans to Friends.

Can donations will be accepted at 1170 East Warnock Ave (2490 South). 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 Lindsey and arrangements will be made for 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 **Lindsey at 801/485-7307.**

SUBMITTING MATERIAL FOR PUBLICATION

1. **What to submit:** original articles (historical, geological, geographical, biographical, political, fiction, poetry, etc.) or art work (sketches, photographs, etc.) which pertain to Great Salt Lake.
2. **Submitting material:** Mail or deliver to 1117 E. 600 S. Salt Lake City, UT 84102. Or e-mail to: ldefreitas@earthlink.net
3. **Please call 801/583-5593** to confirm receipt of e-mail or with any other questions, suggestions, comments, or ideas.
4. **Deadlines:** The deadlines for submittals are Sept. 16 (Fall), Dec. 16 (Winter), Mar. 16 (Spring), and June 16 (Summer).

Friends of Great Salt Lake wants to thank the following businesses for their generous support: **Xmission.com** for donation of services to support us on the World Wide Web and **Tooele Transcript Bulletin** for supporting our printing needs.

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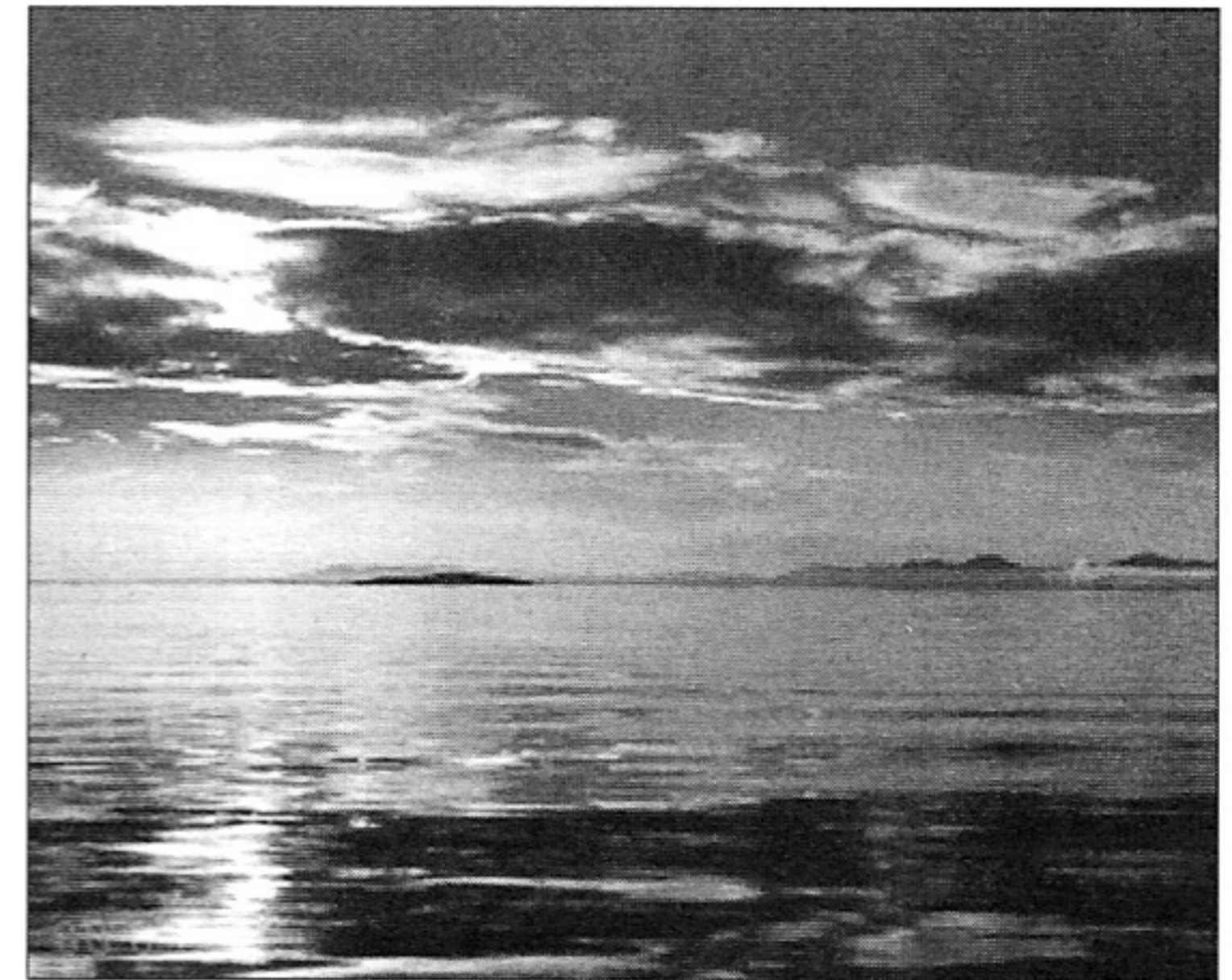
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Lake Fact Answer:
3: Bear, Weber, Jordan

Big thanks to the following contributors to Our Education Programs

Rob Bero	Walter McCormick	Sarah Uhle
June Campbell	Sally and Bob Neill	Bruce Waddell
E.R. Dumke Jr. and	Consuelo Nelson	Kathy Waddell
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PHOTO BY WAYNE A. WURTSBAUGH



Sunset over Bridger Bay - GSL

Membership Notice: Time to Renew

Have you noticed, and wondered, why you haven't received a FOGSL membership renewal letter? In our effort to save paper, we are asking you, our dear members, to keep track of when it's time to renew your membership by checking the label on your newsletter. On your label, below your name, there will be listed the membership due date. Also, labels will be printed to mention that your due date has arrived. Thank you for your attention to this and your great support!

If you have a question about your membership, please call Lynn at 801-583-5593. **Big Thanks!**



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Please consider making a donation to the following education efforts:

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Project SLICE - our 4th grade curriculum on Great Salt Lake, includes Speakers Network, Teacher Training Institute, Lakeside Learning Field Trip, and 10 units of study.

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For more information on these programs, contact Bruce Thompson at 801/467-3240

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