

Joint Conference

**10th International Conference on Salt Lake Research &
2008 FRIENDS of Great Salt Lake Issues Forum**



**Saline Lakes Around the World:
Unique Systems with Unique Values**

**University of Utah, Salt Lake City, Utah
May 11-16, 2008**

International Society for Salt Lake Research (ISSLR)
and FRIENDS of Great Salt Lake present the joint

10th International Conference on Salt Lake Research & 2008 FRIENDS of Great Salt Lake Issues Forum

University of Utah
Salt Lake City, Utah
May 11-16, 2008

PROGRAM AND ABSTRACTS

Conference Co-Chairs:

Wayne Wurtsbaugh
Lynn de Freitas
David Naftz

Local Organizing Committee

Bonnie Baxter
Lynn de Freitas
Heidi Hoven
Robert Jellison

David Naftz
Jacob Parnell
Giovanni Rompato

Brian Timms
Carla Trentelman
Bart Weimer
Wayne Wurtsbaugh

Website Construction and Cover Art

Charles Uibel: greatsaltlakephotos.com

Program and Abstracts

Compiled by Patsy Palacios and
Carla Koons Trentelman

The International Society for Salt Lake Research and FRIENDS of Great Salt Lake sincerely thank the following sponsors for their support:



Joint Conference Sponsorship List

Pre Conference Field Trip

Westminster College

Proceedings Publication and Program Printing

USGS

College of Natural Resources, Utah State University

Sunday Evening Reception

Chevron

Tuesday Evening Poster Session Reception

CH2MHill

Ken Sassen

Mid-Conference Field Trip

Utah Division of Water Quality/DEQ

Thursday Evening Banquet

Great Salt Lake Minerals Corporation

Great Salt Lake Brine Shrimp Cooperative, Inc.

The Nature Conservancy

Breaks

Mono Lake Committee

Ducks Unlimited

Utah Wetlands Foundation

SWCA Environmental Consultants

Tides Foundation

Conference Facilities

FRIENDS of Great Salt Lake

Student Travel/Scholarships

Kennecott Utah Copper Corporation

Center for Integrated BioSystems

National Science Foundation



Special thanks to FRIENDS of Great Salt Lake for their generous sponsorship of the conference facilities.



International Society for Salt Lake Research

Promoting the study, management, use, and conservation of salt lakes



About ISSLR:

The primary purposes of the society are to establish effective liaison between persons interested in any aspect of inland saline lakes (including solar pans), to encourage these interests, and to educate the public in the scientific use, management, and conservation of salt lakes. To accomplish these purposes the society: holds a triennial international conference on salt lake research; produces special publications on salt lake research; maintains this web site for the purpose of facilitating communication among members, other professionals, and the public; provides a listing of members' current interests and research; provides a bibliography of salt lake research; and encourages interest in the limnology of salt lakes. Visit the website at <http://www.isslr.org/>

Board of Directors:

President - Brian V. Timms
Vice-President - Aharon Oren
Secretary-Treasurer - Robert Jellison

Members-at-Large:

Javier Alcocer
Andrei Degermendzhy
Stuart Hurlbert
Jacob John

Dirk Verschuren

Jasmine Saros
Mianping Zheng
Wayne Wurtsbaugh



FRIENDSof
Great Salt Lake

About FRIENDS of Great Salt Lake:

Founded in 1994, 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. The long-term vision of FRIENDS is to achieve comprehensive watershed-based restoration and protection for the Great Salt Lake Ecosystem.

The Board of Directors and Advisory Board consist of professionals in the scientific, political, literary, education, and broadcast communities. The organization sponsors an array of programs, activities, and materials in pursuit of its mission. Every two years, FRIENDS hosts the Great Salt Lake Issues Forum to provide a focused discussion about the lake for policy makers, researchers, planners, industry and other stakeholders. Visit the website at www.fogsl.org.

Board of Directors:

President - Scott Dwire
Vice President - Rob Dubuc
Secretary - Brent Bardo
Treasurer - Amy Price

Directors:

Juan C. Arce-Larreta
Tim Brown
Barry Quinn
Alisa Schofield
Rob Wilson

Staff:

Executive Director - Lynn de Freitas
Assistant Director - Katie Pearce
Membership & Outreach - Becki Wright

GENERAL INFORMATION AND ACCOMMODATIONS

CONFERENCE VENUE

The University Guest House, Officers' Club and Post Theatre on the Fort Douglas part of the University campus will be the focus of most of the conference activities.

Parking is available at the conference; if you have any questions about parking, ask at the registration desk. The Conference Services Office in the lower level of the Guesthouse Hotel can provide limited assistance with copying, faxing, etc. Additional facilities are available at the Fed Ex Kinkos Office & Print at 200 University Street SLC (801-583-3480). Wireless Internet is available at the Guest House and in the Fort Douglas buildings. Full access computers can be found in the Guest House lobby, all day - every day. Coffee, tea, and vending machines will be available in the lobby area of the Guest House. For further University information call 801-581-7200.

Special thanks to Mono Lake Committee, Ducks Unlimited, Utah Wetlands Foundation, SWCA, Environmental Consultants, and Tides Foundation for their generous sponsorship of the breaks.

INFORMATION FOR PRESENTERS

Oral Presentations:

Computers and projectors will be available in each session for PowerPoint presentations. You should upload your presentation from a memory stick (USB Flash Drive) or CD on the morning of your presentation. You can proof your presentation in the Board Room in the basement of the University Guest House. If you need other audio-visual aids, please contact Wayne Wurtsbaugh (wurts@cc.usu.edu).

Poster Presentations:

Posters can be put up Sunday evening at 6:00 PM during the Welcoming Social. They will be displayed Monday morning through Friday at 3:00 PM. Two specific poster sessions are scheduled on Tuesday and Thursday afternoons. You should spend time at your poster during these periods to answer questions and discuss your work with other scientists. If you have questions, please contact Dr. Bonnie Baxter (bbaxter@westminstercollege.edu).

Publication of Conference Papers in Conference Proceedings:

Presenters may submit their paper for publication in the on-line book series, *Natural Resources and Environmental Issues* (<http://www.cnr.usu.edu/quinney/htm/publications/nrei>).

The series is based on original monographic research and each submission will be reviewed by one or more outside experts. To be considered for publication, manuscripts should be submitted to the proceedings to the editor on or before July 30th.

Instructions for authors can be accessed at:

http://www.isslr.org/GSL2008/Proceedings_Publication/Proceedings_Author_Instruct.pdf

Special thanks to S.J. and Jessie E. Quinney Natural Resource Research Library for their generous sponsorship of the proceedings publication.

SUNDAY EVENTS

Pre-Conference Field Trip

7:30 AM - 5:00 PM, Cost \$10

The Hypersaline North Arm of Great Salt Lake

Trip Leader: Dr. Bonnie Baxter, Westminster College

Meet at the University Guest House entrance.

Great Salt Lake (GSL) is actually two lakes bisected by railroad causeway. The south arm, closest to Salt Lake City, is currently at 12% salinity while the more remote north arm is at saturation, closer to 30%. Led by Dr. Bonnie Baxter of Westminster College, who studies the microbiology of the lake, this pre-conference field trip will introduce you to this hypersaline part of the Great Salt Lake. We will explore the pink water, the geology, the oil seeps, the salt crystals, the colony of pelicans, and the eco-sculpture, "Spiral Jetty" by artist Robert Smithson. This excursion is limited to the first 30 registrants.



Special thanks to Westminster College for their generous sponsorship of this field trip.

Registration and Opening Social

6:00 PM to 7:30 PM

Officers' Club



After settling in at the hotel, come to the Officers' Club to pick up your registration materials from 5:30 to 6:30, then relax with a beer or glass of wine and hors d'oeuvres at the opening social from 6-7:30 pm. Supper is on your own. You can dine on campus at the Heritage Center Dining Hall. Off campus options include restaurants on Foothill Drive or 1300 East between 200 S. and 300 S. or hopping on TRAX light rail for downtown dining.

Special thanks to Chevron for their generous sponsorship of this social event.

OPENING CEREMONY
Monday, May 12, Post Theatre
8:00 AM

Join us for a warm welcome to the 10th International Conference on Salt Lake Research & 2008 FRIENDS of Great Salt Lake Issues Forum

Hosted by Brian Timms

President of the International Society for Salt Lake Research
“We are a diverse group of enthusiasts, trained in various sciences; engineering, management, consultancy, natural history, and more. Our subject binds us together and every three years we host an international conference. These conferences are relatively small and very friendly meetings which are quite interdisciplinary and hence can be somewhat different from other scientific meetings.”

<http://www.isslr.org/isslr/presmsg.htm>



Opening Ceremony Welcoming Speech

By: Michael Mower

Prior to his appointment as Planning Coordinator for the state of Utah, Michael Mower served in the Governor's Office as Deputy Chief of Staff and Communications Director. He also served as the Director of Community and Government Relations for Provo City, a position he had held since 2000. He has served as the Senior Staff Attorney at the Legal Aid Society of Salt Lake and as President of the Young Lawyers Division of the Utah State Bar.



PLENARY SPEAKERS

Robert Jellison:

"The Conservation and Management of Salt Lakes: Past, Present, and Future"

Monday, May 12, 8:45 AM, Post Theatre

Professional affiliation:
Marine Science Institute
University of California
Santa Barbara, CA 93106



Robert Jellison conducted his doctoral research on the limnology of hypersaline Mono Lake during an extended period of meromixis. He earned his Ph.D. in limnology at the University of California, Santa Barbara (1992) and continued his studies of Mono Lake as a research associate at the University of California. His saline lake research has ranged from viruses to birds and he has been a leader in illustrating how natural variations in local climate and anthropogenic influences affect the functioning of salt lake ecosystems. He is keenly interested in the scientific management and conservation of salt lakes worldwide.

ABSTRACT

Inland saline lakes are widespread throughout the arid and sub-arid regions of the world and include a diverse array of aquatic ecosystems of considerable economic and ecological value. Overall they constitute ~45% (11% excluding the Caspian Sea) of the volume of inland waters, and in some areas are the dominant aquatic habitat. Changing size and salinity of permanent saline lakes markedly affects their ecological values and throughout much of the 20th century many permanent saline lakes shrank or became desiccated due to water diversions for irrigated agriculture. During the past several decades their ecological importance, especially to migrating and breeding birds, has become widely recognized and conservation efforts have been initiated by international, national, and local non-governmental organizations. However, economic development and increases in population are increasing the demand for fresh water. The merging of agriculture and energy sectors via biofuel production also has the potential to greatly increase water demand. Furthermore saline lakes are particularly sensitive to global climate change as they respond quickly to changes in their hydrological regime and global climate models consistently predict decreased precipitation over sub-tropical land masses. The future of many saline lakes will be decided over the next several decades as the direct economic value of fresh water inflows are weighed against the less easily measured ecosystem goods and services provided by these unique ecosystems.

PLENARY SPEAKERS

Ittai Gavrieli:

“Is the Dead Sea Dying & Will the Proposed Red Sea-Dead Sea Conduit Save It?”

Tuesday, May 13, 8:30 AM, Post Theatre



Professional affiliation:
Department of Geochemistry & Environmental Geology
Geological Survey of Israel
Jerusalem, 95501, Israel

Ittai Gavrieli earned his MS and Ph.D. in geochemistry from the Institute of Earth Sciences, The Hebrew University of Jerusalem. He is with the Geological Survey of Israel since 1992 and was also an Adjunct Associate Research Scientist at Lamont Doherty Earth Observatory between 1999 and 2005. His studies focus mainly on the evolution of brines and on groundwater pollution. Since 1992 Ittai has coordinated the Dead Sea studies in the Ministry of Infrastructure. Following the renewed discussions about constructing the "Peace

Conduit" in the early 2000s he initiated and is engaged in formulating a model for the Dead Sea that would simulate the impacts of the project on the physical, chemical and biological characteristics of the Dead Sea.

ABSTRACT

The Dead Sea, one of the most saline lakes in the world (TDS \approx 280 gr/kg; density \approx 1.240 gr/cc) is the latest of a series of lakes that existed in the Dead Sea Rift valley since seawater first transgressed into the valley and formed the Sedom lagoon in the late Neogene. The unique Ca-Cl composition of these lakes evolved through seawater evaporation, salt precipitation, water rock interaction and freshwater inflow. The Dead Sea came into existence in the early Holocene after the desiccation of its precursor, Lake Lisan in the late Pleistocene. Since then, its water level has been fluctuating in response to climatic changes. However, as of the middle of the 20th century, the Dead Sea has experienced a negative water balance which is mainly due to the diversion of water from its catchment area, resulting in water level decline of nearly 30 meters. The continuous water level decline, which over the last decade has averaged 1 m/yr, has resulted in the drying of the Dead Sea southern basin, overturn of the water column which was meromictic for at least 400 years, onset of halite precipitation, retreat of shorelines and exposure of large mudflats, subsidence and development of sinkholes along its shore, collapse of the surrounding infrastructure and cessation of all planning and development in the region. Plans are being considered to pipe water from the Red Sea to the Dead Sea in order to stop the decline in water level, while utilizing the >400 meter elevation difference between the Seas to desalinate seawater. Yet, the mixing of seawater and/or reject brine from the desalinization plant with Dead Sea brine will result in changes in the limnology of this terminal lake that over the long run will change its characteristics and uniqueness.

PLENARY SPEAKERS

Aharon Oren:

"Microbial Diversity and Microbial Abundance in Salt-Saturated Brines: Why Are the Waters of Hypersaline Lakes Red?"

Tuesday, May 13, 9:00 AM, Post Theatre

Professional affiliation:

The Department of Plant and Environmental Sciences

The Institute of Life Sciences

The Hebrew University of Jerusalem

Jerusalem, Israel

Aharon Oren was born in Zwolle, The Netherlands (1952). He earned his M.Sc. degree in microbiology and biochemistry at the University of Groningen (1974) and his Ph.D. degree in microbiology at the Hebrew University of Jerusalem (1978). He is currently professor of microbial ecology at the Institute of Life Sciences, The Hebrew University of Jerusalem. He has authored or edited nine books and over three hundred other scientific publications. His research centers on the ecology, physiology, biochemistry and taxonomy of halophilic microorganisms and the microbiology of hypersaline environments.



ABSTRACT

Salt-saturated lakes such as the north arm of Great Salt Lake and saltern crystallizer ponds contain 10^7 - 10^8 and more red microorganisms per milliliter. Even the Dead Sea occasionally turns red due to microbial blooms. Three types of organisms may contribute to the coloration: the alga *Dunaliella salina* rich in β -carotene, halophilic Archaea (family Halobacteriaceae) containing bacterioruberin carotenoids and sometimes also retinal proteins (bacteriorhodopsin, halorhodopsin), and the recently discovered *Salinibacter* (Bacteroidetes) with unusual carotenoid and retinal pigments. Improved cultivation techniques have enabled isolation of the elusive *Haloquadratum walsbyi* that dominates the archaeal community in many lakes. Glycerol synthesized as an osmolyte by *Dunaliella* is often considered a key nutrient in hypersaline environments. However, *Haloquadratum* poorly uses glycerol. The importance of other substrates including dihydroxyacetone is now being explored. Combined estimates of substrate uptake in the environment, analysis of metabolic processes in isolated organisms, and environmental genomic approaches providing information about the metabolic potential of yet-to-be-cultivated organisms, provides a deeper insight into the functioning of the apparently simple, but in reality surprisingly complex ecosystems of the red brines of salt-saturated lakes.

PLENARY SPEAKERS

Walt Baker:

"The Long Road to Developing a Selenium Standard for Great Salt Lake (and Beyond)."

Thursday, May 15, 8:30 AM, Post Theatre



Professional affiliation:
Utah Department of Environmental Quality
Division of Water Quality
Salt Lake City, Utah

Walt graduated with a B.S. Degree in Civil and Environmental Engineering from Utah State University. He worked for a consulting engineering firm before joining the Division of Water Quality in 1984. He was appointed Division Director and Executive Secretary of the Water Quality Board in April 2005. He serves on the Western States Water Council, the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) board of directors, the national Water Quality

Standards Managers Association and the Utah Lake Commission. He is a licensed professional engineer in Utah.

ABSTRACT

Great Salt Lake is a unique Utah and regional water body --- so much so that it has a beneficial use classification in Utah's water quality standards (Class 5) that is singular to itself. Great Salt Lake has historically been without numeric standards to protect its uses, which are for primary and secondary contact recreation; waterfowl; shore birds; other water-oriented wildlife, and the aquatic organisms in their food chain; and mineral extraction. Instead, numeric standards assigned to the three major rivers that feed into Great Salt Lake, effluent limits for municipal and industrial discharges to the lake and general narrative standards have been relied upon to protect this ecologically important water body. Soon there will be added protection.

The end of May 2008 will see the culmination of a 4-year, \$2.3 million effort to develop the first numeric water quality standard (selenium) for Great Salt Lake. I will explore the catalyst for this initiative, the process that was followed, the innovative funding mechanisms that were secured to fuel the effort, the extraordinary scientific contributions by many, and what the future may hold for the further protection and management of Great Salt Lake.

PLENARY SPEAKERS

Nickolay Aladin:

"The Aral Sea: Politics, Salinity and the Creeping Changes in Biological Communities of an Endangered Ecosystem."

Thursday, May 15, 9:00 AM, Post Theatre

Professional affiliation:

Laboratory of Brackish Water Hydrobiology.
Zoological Institute, Russian Academy of Sciences
St-Petersburg, Russian Federation

Nick Aladin was born in St-Petersburg, Russian Federation (1954). He earned his M.Sc. degree (1976) in zoology at the University of St-Petersburg and his Ph.D. (1979) and Dr. Sc (super Ph.D. (1995)) at the Zoological Institute of Russian Academy of Sciences, St-Petersburg. He is currently professor of zoology and head of the Laboratory of the Brackish water Hydrobiology (Zoological Institute of Russian Academy of Sciences, St-Petersburg). He has authored or edited seven books and over one hundred other scientific publications. His research centers on the ecology, osmotic and ionic regulation of brackish, marine and halophilic Cladocera and Ostracoda and the hydrobiology of brackish and hypersaline environments. He also studied palaeontology of Crustacea and palaeolimnology of Aral and Caspian Lakes as well as marine biology of Black, Azov and Baltic Seas.



ABSTRACT

The first critical period of the Aral Sea aquatic ecosystem transformation happened in the 1920s when exotic species were first introduced by man. The second period happened in the 1950s with additional mass introduction of exotic species. The third period began in 1971-1976 with the beginning of desiccation and salinization of the Aral. During this period brackish water species of freshwater origin disappeared when salinity exceeded 12-14 g/l. The fourth period was in 1986-1989 when the brackish water species of Caspian origin disappeared when salinity exceeded 23-25 g/l. The fifth period (1999-2003) was the catastrophic desiccation and salinization of the Large Aral. Species with marine origins vanished when salinity exceeded 80-100 g/l. Only salt-tolerant, hyperhaline organisms survived. In 1988-1989 the desiccating Aral split into northern Small Aral and southern Large Aral and two separate ecosystems began development. Since dike construction in Berg's strait that separated the two basins, the Small Aral has had a positive water balance and salinity is decreasing. The rehabilitation of the Small Aral aquatic ecosystem is possible due to construction of a new solid dam that by 2006-2007 increased the level up to +42 m and decreased salinity to 10-12 g/L. Biodiversity has also increased substantially. However, since separation the Large Aral has had a negative water balance (salinity is coming up and level is decreasing). Rehabilitation of its aquatic ecosystem is not possible. The only profitable business in this system will be the harvesting of brine shrimp cysts. In 2004-2007 the Large Aral separated into Eastern and Western lakes plus Tschebas Lake--all with hyperhaline aquatic ecosystems.

PLENARY SPEAKERS

Douglas A. Barnum:

"The Salton Sea: Integrated Science for Salvaging California's Largest Lake"

Friday, May 16, 8:30 AM, Post Theatre



Professional affiliation:
US Geological Survey
Salton Sea Science Office
La Quinta, California

Dr. Barnum has degrees from the University of Missouri, Washington State University and a Ph.D. from Brigham Young University in zoology, wildlife biology and range management. He also completed a post-doctoral assignment with University of California-Davis. Prior to his current

assignment, Dr. Barnum worked as a research wildlife biologist for the U.S. Department of Interior principally on the issues of wildlife interactions with agricultural drainage water in California's Central Valley, and livestock/endangered species relationships. Dr. Barnum has been involved in research at the Salton Sea since 1990 and since 2000 has worked as a Wildlife Biologist/Science Coordinator for the USGS Salton Sea Science Office in La Quinta, California.

ABSTRACT

The Salton Sea ecosystem is rapidly changing because of increasing salinity and decreasing inflows. Only a few fish species remain, and the lake will soon lose its role as an important habitat for migratory birds unless solutions to the myriad of problems are enacted. The U.S. Geological Survey (USGS) is assisting in restoration planning for California's largest lake by facilitating science evaluations and oversight, and is helping to link resource managers with the scientific community. The USGS also is leading the development of an integrated Science Plan that addresses diverse issues such as biological sustainability, water and air quality, contaminants, and social and economic values. USGS scientists and others are exploring the potential for created saline habitat as a means of providing safe and productive habitat for fish and migratory birds. USGS is helping to design an integrated monitoring and assessment plan for the Salton Sea as the lake's salinity increases beyond most biological tolerances.

SPECIAL PRESENTATION

Hikmet Loe

“Spiral Jetty and the Power of Place”

Monday, May 12, 7:30 PM – 9:00 PM, Post Theatre

Robert Smithson's iconic earthwork, Spiral Jetty, is located at Rozel Point in the north arm of Great Salt Lake. This region is remote, the landscape both harsh and beautiful. Since its creation in 1970, Spiral Jetty has brought visitors to the area to experience sculpture on a grand scale on the land. Yet this region is home to other interests as well, ranging from cattle ranching, brine shrimp harvesting, scientific inquiry, to oil drilling. This lecture will focus on Spiral Jetty as the catalyst to discover the power of place at Rozel Point.

In 1999, the Estate of Robert Smithson gave Spiral Jetty to Dia Art Foundation, a nonprofit institution founded in 1974 internationally renowned for initiating, supporting, presenting, and preserving art projects. For more information on Spiral Jetty, visit Dia's website, www.diaart.org.

Hikmet Sidney Loe is an art historian at Westminster College and Fine Arts Department Manager at Salt Lake City Public Library.

SPIRAL JETTY - MICHAEL SLADE



SPECIAL PRESENTATION

Michael Slade

“The Great Salt Lake Photographic Survey”

Wednesday, May 14, 7:30 PM – 9:00 PM, Post Theatre

Michael Slade has been visiting Utah’s Great Salt Lake since 1987, returning to it repeatedly to photograph and explore. In 2005 a focused effort to discover and share the various stories from the lake began. Initially starting out as a few test images to see if the lake really had what it took to capture his imagination for a prolonged period of time, the lake has proved worthy of a multi-year study. Slade is attempting to create a photographic portrait of the lake and share the multi-faceted and complex character of Utah’s inland sea. Taking cues from early explorers, historians, cartographers, painters and photographers. Slade is creating a document in the spirit of the grand surveys from the late 19th Century.

Quickly discovering that Great Salt Lake has more than one side, Slade attempts to be inclusive with the types of images he is making. There are so many stories in fact, that the initial project that was intended to only last a few years, has grown into something much larger. How much larger, Slade still isn’t sure of. Slade admits that he is not a scientist, having formal photographic training from Utah State University where he is currently finishing his Master of Fine Arts degree. Slade has worked all over the world photographing for commercial clients and pursuing his own art.

Come join Michael for an evening of discussion and a presentation of his work. Slade will be showing still and moving images on screen, a selection of prints (some measuring up to six-feet in length), and explaining his processes and goals. The survey is online at: www.gslps.org



SPECIAL EVENT

This Is The Place Heritage Park Banquet

Thursday, May 15, 5:45 PM - 10:00 PM



Location: Bowery, 2601 East Sunnyside Ave.

(In the case of inclement weather the banquet will be relocated to the Officers' Club – it will be announced if this occurs)

Transportation by bus to the Heritage Village will leave from the entrance of the University Guest House promptly at 5:30 PM and return by 10:00 PM. Spring in the Rockies can be cool and unsettled, so bring along some warm clothing so you can relax and enjoy the evening.

A sumptuous Dutch oven buffet of garden fresh greens, a yummy vegetarian option, chicken, barbecued ribs, and fresh peach cobbler ala mode should satisfy even the most discerning palate.

Tickets for purchasing beer and wine will be available. Music will be provided by the Avenues Jazz Trio.

Special award recognitions include the Williams Award presented by ISSLR; and the Doyle Stephens Scholarship Award and Friend of the Lake Award presented by FRIENDS of Great Salt Lake.

Keynote Speaker:

Rainer Hoenicke

"How Much is Enough? The Need for Local Watershed Goals"

Dr. Hoenicke is a systems ecologist and has spent a good part of his career on making science relevant to decision-makers. He received his B.S. in Agricultural Sciences from the University of Bonn, Germany, and his Ph.D. in Ecology from the University of California at Davis. After completing a postdoctoral fellowship at Moss Landing Marine Laboratories, he coordinated field logistics for EPA's National Acid Precipitation Program and subsequently helped expand the National Estuary Program to Southern California at the Los Angeles Regional Water Quality Control Board. He served as lead scientist for the Santa Monica Bay Restoration Project until he first joined the San Francisco Estuary Institute in



1994. After two years in the Office of the California Resources Secretary, where he spearheaded the development of a comprehensive landscape assessment program and the use of scientific criteria in making conservation investment decisions, he returned to the Institute in 2004.

Special thanks to Great Salt Lake Minerals Corporation, The Great Salt Lake Brine Shrimp Cooperative, Inc., and The Nature Conservancy for their generous sponsorship of this event.

SPECIAL PRESENTATION

Rosalie Winard

“An Itinerant Photographer of the Wetlands”

Friday, May 16, Noon – 1:00 PM, Post Theater



Imagine banding 2,500 white pelican chicks at Chase Lake NWR in North Dakota, airboating on the Great Salt Lake amongst avocets, black-necked stilts and white-faced ibises, or sleeping in the middle of the Platte River in Nebraska surrounded by thousands of vociferous sandhill cranes. With her camera, Rosalie Winard has witnessed and documented avian adaptations to habitat encroachment and the sudden disappearance and re-emergence of bird colonies. She will accompany her talk with photographs from her new book, *Wild Birds of the American Wetlands*, as well as photos from her personal archives.

Rosalie Winard has spent the last 30 years enamored with wetland birds. While receiving her bachelor's degree in Natural History, specializing in ornithology and ethology, she conducted a field study on threat and greeting displays of the brown pelican in Robert's Bay, Sarasota, Florida. Receiving one of the first Student Originated Studies Grants, she worked for the National Science Foundation censusing bird populations all over Florida before careers in documentary film, video art and finally, photography.



Winard's award-winning photographs have appeared worldwide in numerous publications including *Artforum*, *Time*, *U.S. News & World Report*, *Forbes*, *The New York Times*, and on *60 Minutes*. Her pictures are in the collections of The Library of Congress, The Brooklyn Museum of Art, Nelson Mandela and Oliver Sacks.

MID-CONFERENCE FIELD TRIPS

Wednesday, May 14, all day



Great Salt Lake Trip Organizer: Dave Naftz

Two field trip options will allow participants to experience Great Salt Lake. **Buses for both trips will board in the parking lot of the University Guest House promptly at 8:45.** Trips will return by 5:00 PM.

Option 1. Gilbert Bay

After a one-hour bus tour from the University of Utah we will arrive at the scenic Antelope Island Marina. After arriving at the marina we will board the Majestic Islander cruise boat to tour Great Salt Lake and discuss various biogeochemical, limnological, and ecological issues facing this ecosystem. After our 1-hour cruise, we will take a scenic 45-minute bus tour along the east side of Antelope Island to the historic Garr Ranch, located at Garr Springs, one of the strongest and most consistent of the 40 springs on Antelope Island. At the ranch we will enjoy a western BBQ lunch of bison burgers, cheese burgers, vegetarian choice, buffalo chips, and cow pie brownies with plenty of lemonade to wash it down. After lunch we will depart on the Antelope Island Wildlife Safari. During the safari we will view the island's wildlife on board an open-air World War II Amphibious Army DUKW (open air vehicle that travels on land or in water).¹

¹Due to limited boat capacity, we will break into two groups (A and B). Group A will do the boat tour in the morning and wildlife safari in the afternoon. Group B will do the wildlife safari in the morning and boat tour in the afternoon. Both groups will be together for lunch.

Option 2. Antelope Island

Leaders: Jolene Hatch and Wayne Wurtsbaugh

We will travel to the island by bus across a causeway separating Gilbert and Farmington Bays. The tour of Antelope Island State Park will include: a stop at a



hydrological monitoring station and discussion of hyper-eutrophication of Farmington Bay; geologic points of interest; an option for a short hike to Buffalo Point overlooking the lake; a chance to wade, swim and collect brine shrimp, and a visit to the park's visitor's center. Ample opportunities will be provided to photograph the island's resident buffalo herd, birds and other wildlife. Dr. Frank Howe, non-game avian specialist for the Utah Department of Wildlife Resources, will be on hand to answers birding questions while on the Ranch.

Special thanks to Utah Division of Water Quality/DEQ for their generous sponsorship of these field trips.

OTHER CONFERENCE EVENTS

Posters:

Posters will be located in the Officers' Club - East Conference Room and the West Conference Room. Posters will be available for viewing throughout the week, from Monday morning through Friday at 3:00 PM.

Poster sessions with poster presenters will be held on two occasions. Tuesday, May 13, Poster Session and Social, Officers' Club East Conference Room. Spend time visiting with poster presenters and talking about saline systems over wine and hors d'oeuvres. Music provided by the Avenues Jazz Trio. Supper is on your own. Options include the Heritage Center Dining Hall on campus, where meal tickets and/or cash are accepted, or off campus dining options. Thursday, May 15, poster session at 4:30 in the Officers' Club West Conference Room will include refreshments.

Special thanks to CH2MHill and Ken Sassen for their generous sponsorship of this social event.

Living Lakes USA Network:

Hosted by: The Living Lakes Network and the Mono Lake Committee

Thursday, May 15, 4:30 PM - 5:30 PM

Officers' Club North Conference Room

Living Lakes is an international network whose mission is to enhance the protection, restoration and rehabilitation of lakes, wetlands, and other freshwater bodies of the world. Currently a network of 45 lakes, Living Lakes strives for effective watershed protection around the world.

The Mono Lake Committee, a founding member of Living Lakes, is eager to have contact with scientists and others who are actively exploring the issues concerned with their unique survival and prosperity.

Stop by the West Conference Room in the Officers' Club during Thursday's poster session from 4:30-5:30 p.m. for a lively discussion on the idea of creating a new Living Lakes network in the US.



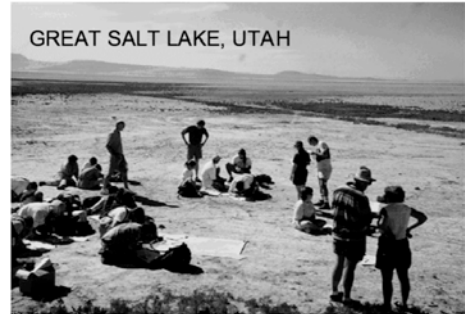
Wondering how a network focused on drinking water and a conference focused on salt water make for a good discussion? Join us to find out!

OTHER CONFERENCE EVENTS

Environmental Education Forum

Monday, May 12, 4:00 PM, Post Theatre

Do you want to know more about the Great Salt Lake? Would you like to see what other educators have done pertaining to the Great Salt Lake? If so, please join us for the Environmental Education in Saline Systems / Watershed Roundtable Discussion. ½ day registration for educators is only \$35. Registration in advance is preferable, but you may register at the conference desk in the Officers' Club.



Membership Meeting for International Society for Salt Lake Research

Monday, May 12, 5:20 PM – 7:00 PM, Officers' Club South Room

Members of ISSLR will meet to discuss the future plans of the organization, the next meeting locale and other society business.

Workshop Lunch:

Research Agendas for Saline Lakes - Lessons learned on how to plan and prioritize technical issues and research needs.

Organizer: Dr. Genevieve Atwood, University of Utah
Thursday, May 15, Noon, Officers' Club South Room

In many areas of the world, management of salt lakes is coming to the forefront, yet research on these systems often lags behind that of freshwater lakes. During this working lunch we will focus on prioritizing research needs for complex, closed basin ecosystems. Researchers and managers dealing with salt lakes are encouraged to come and share their experiences. You may want to reserve a box lunch for this activity.



CONFERENCE EVENTS FOR STUDENTS

Student Luncheon:

Tuesday, May 13, Noon, University Guest House - Meeting Room C

Students will be able to meet each other and enjoy lunch while listening to a talk by Brian Timms, President of ISSLR, about saline lake research in Australia. Lunch will be provided.

Student Career Panel:

Tuesday, May 13, 7:30 PM - 9:00 PM, University Guest House - Meeting Room C
Students will have the opportunity to learn about various careers held by meeting participants. Professionals from different types of jobs will describe their current work, discuss critical skills and attributes needed for their positions, and give helpful advice and information to interested students. There will be a question and answer session as well as an open time for socialization among students and professionals.

W.D. Williams Award for Student Presentations



The award is presented to superior student presentations (oral and poster) at ISSLR conferences. This award was established in memory of W.D. (Bill) Williams (1936-2002), a distinguished limnologist and advocate for salt lakes research and conservation. He became a leading pioneer for limnology in Australia, and was appointed Professor of Zoology at the University of Adelaide in 1974 and Emeritus Professor on his retirement in 1994. Throughout his long and distinguished career, Bill became an International leader in limnology and conservation of inland waters throughout the world. His exuberance and love of science was infectious and inspired a generation of new limnologists. Past winners: Michelle Hindle (Univ. Wollongong, NSW), Lien Sim (Murdoch Univ., WA), Courtney Salm (Univ. Wisconsin, La Crosse, WI, USA)

Doyle W. Stephens Scholarship

The Doyle Stephens Scholarship will be presented at the conference banquet. Doyle Stephens was born in Ogden, Utah, in 1944. He received his BS in Biology from Weber State College in 1967, his MS in Entomology in 1969, and his Ph.D. in Limnology from the University of Utah in 1974. At the time of his death in May 2000, Dr. Stephens had been a research hydrologist for the U.S. Geological Survey for nearly 20 years. In 2001, he was posthumously awarded the Governor's Medal for Science and Technology. Through his work on the lake, Doyle made significant contributions toward public awareness of critical issues relating to Utah's natural resources and environment. This scholarship provides support to undergraduate or graduate students engaged in new or on-going research that furthers the understanding or protection of the Great Salt Lake Ecosystem.



CONFERENCE EVENTS FOR STUDENTS

The Friends of the Lake Award

The Friend of the Lake Award is given to a person, organization, or business performing outstanding work in education, research and/or advocacy to benefit Great Salt Lake. Established in 2002, the purpose of the award is to acknowledge the vibrant and active community of people working on behalf of the lake. Their efforts help increase our understanding and awareness of our big salty neighbor. Understanding can lead to positive action for preservation of Great Salt Lake. To recognize these talents and contributions, FRIENDS of Great Salt Lake has created the award to be given at the Biennial Great Salt Lake Issues Forum. The award will be given at the Thursday banquet.

Past Recipients of the Award:

2002 - The Late Dr. Donald R. Currey - Geomorphologist in the Department of Geography, University of Utah, Salt Lake City, Utah.

2004 - Joy Emory - Environmental Engineer

2006 - Al Trout - former manager of the USFWS Bear River Migratory Bird Refuge, Brigham City, Utah.

Special thanks to Kennecott Utah Copper Corporation, the Center for Integrated BioSystems, and the National Science Foundation for their generous sponsorship of student travel and scholarships.



POST CONFERENCE FIELD TRIP

Saturday, May 17 - Monday, May 19

This is a 3-day vehicle/camping tour of the perimeter of Great Salt Lake. This trip will introduce participants to the wetland areas of the east shore, the remote North Arm of the lake where salinities are near 30%, and the remote western margins of the lake. Highlights of this trip will include the following as time and weather permit: Farmington Bay Waterfowl Management Area, The Great Salt Lake Shorelands Preserve, commercial salt ponds, Golden Spike National Historic Site, an eco-sculpture (Spiral Jetty), ghost town of Kelton, archaeologically important Hogup Cave, Lucin Cutoff (railroad causeway bypass crossing GSL) and the Lakeside Mountains.



Golden Spike National Historic Site

On May 10, 1869, two railroad companies, Union Pacific and Central Pacific, joined 1,776 miles of rail at Promontory Summit, Utah Territory. This event sparked unforetold consequences still reflected in our great nation today. Golden Spike National Historic Site commemorates this incredible accomplishment of the completion of this nation's first transcontinental railroad.

10th Annual Great Salt Lake Bird Festival

Thursday, May 15 - Monday, May 19



The latter part of the conference coincides with the beginning of the Great Salt Lake Bird Festival. This event provides a variety of field trips, presentations and activities for adults and children. There will be several field trips options to the Great Salt Lake, Antelope Island, Bear River Migratory Bird Refuge and many other sites. The event is based in the city of Farmington, about 30 minutes from downtown Salt Lake City. The conference will not provide transportation to this event so you would need to rent a car to participate. For more information see www.greatsaltlakebirdfest.com.

SUNDAY MAY 11th (Evening)

5:30 PM Registration - Officers' Club

6:00 PM Opening Social - Officers' Club

MONDAY MAY 12th

8:00 AM Opening Ceremony - Post Theatre

8:45 AM Plenary Robert Jellison The Conservation and Management of Salt Lakes: Past, Present, and Future - Post Theatre

9:30 AM Coffee Break - Officers' Club West Room

CONCURRENT SESSIONS**1. Microorganisms in Hypersaline Environments - North Room****Chair: Ahron Oren & Bonnie Baxter****2. Physical-Chemical Processes in Saline Lakes - South Room****Chair: Tom Ballatore**

10:00 AM	A. Oren	Environmental Genomics Studies in the Dead Sea	U. Panda	Numerical Modelling of Circulation in a Tropical Lagoon: a Case Study in Chilika Lagoon, East Coast of India
10:20 AM	C. Litchfield	Overview of the Microbial Diversity in Great Salt Lake: Results Using Both Cultivation and Molecular Techniques	K. Reifel	Gypsum Precipitation Events in the Salton Sea: the Role of Mineral Formation on Optical Properties in a Hypersaline Lake
10:40 AM	M. Riddle	Molecular Identification of Microbes Associated with the Brine Shrimp <i>Artemia franciscana</i>	T. Ballatore	Estimating the Global Extent of Endorheic Basins, Terminal Lakes and Saline Lakes
11:00 AM	G. Rompato	Microbial Diversity and Functional Ecology of the Great Salt Lake	K. Hankuliev	Comparative Changes in the Hydrochemistry of the Aral Sea, Uzbekistan (2002 to 2007) and Karabogozgol, Turkmenistan (2000 To 2002)
11:20 AM	B. Baxter	Salty Secrets of Ancient Brine: Cellulose Encased in 250 MA Permian Halite	O. Goncharov	Current State of Hydrochemical Regime and Primary Production in Salt Water Bodies of South of Ukraine

Noon Lunch**1b. Microorganisms in Hypersaline Environments - North Room****Chair: J. Parnell & G. Rompato****3. Wetlands - South Room****Chair: David Herbst**

1:20 PM	J. Parnell	Evidence of Autotrophic Ammonia Oxidation in the Hypersaline North Arm of the Great Salt Lake	H. Hoven	Developing Vegetation Metrics for 305(B)/303(D) Assessments for Great Salt Lake Impounded Wetlands
1:40 PM	C. Oberg	Isolation and Characterization of Chitin-Utilizing Halophiles from the Great Salt Lake, Utah	T. Miller	Use of Macroinvertebrates to Describe Wetland Condition and Beneficial use Support in Great Salt Lake Wetlands
2:00 PM	N. Savage	Characterization of Bacteriophage Isolated from the Great Salt Lake	D. Herbst	Experimental Studies of Changes in Benthic Invertebrate Community Composition and Productivity
2:20 PM	O. Osman	Effect of Osmotic Downshock Treatment on the Yield of Ectone Synthesized by Halomonas Sp. EG6	E. Byron	Restoring the Water Quality of the Salton Sea, California: Challenges in Estimating Risks from Selenium and Eutrophication

MONDAY MAY 12th**2:40 PM Coffee Break - Officers' Club West Room****CONCURRENT SESSIONS****1b. Microorganism Environments (continued) - North Room****3. Wetlands (continued) - South Room**

3:20 PM	T. Lowenstein	Dunaliella Trapped in Fluid Inclusions in Modern and Ancient Halite, Death and Saline Valley, CA	T. Anderson	Avian use of a Constructed Saline Wetland Complex at the Salton Sea, California
3:40 PM	B. Schubert	Bacteria, Archaea, and Dunaliella Trapped in Fluid Inclusions in Ancient Halite, Death Valley	K. Miles	Ecological Balance of Re-created Shallow Water Wetlands, Salton Sea, California
4:00 PM	B. Weimer	Surveying the Metabolic Diversity of the Great Salt Lake	B. Nicholson	Landscape-Level Wetland Conservation: Development of a Special Area Management Plan on the GSL
4:20 PM	B. Swan	Death, Deoxygenation and Diversity in a Desert Lake: Structuring Impact of Sulfide Irruptions on Microbial Communities in the Salton Sea, CA	A. Neville	The Good, the Bad, and the Beautiful Ten Years of Avian Habitat Mitigation Management Near Great Salt Lake Utah
4:40 PM			D. Wenger	Classification of Great Salt Lake Wetlands Using High-Resolution Airborne Multispectral Imagery

4:00 PM Environmental Education Forum – Round Table Discussion - Post Theatre**5:20 PM ISSLR Member Meeting - Officers' Club South Room****7:30 PM Presentation by Hikmet Loe – Spiral Jetty and the Power of Place - Post Theatre****TUESDAY MAY 13th****8:30 AM Plenary Ittai Gavrieli Is the Dead Sea Dying and Will the Proposed Red Sea – Dead Sea Conduit Save it? - Post Theatre****9:00 AM Plenary Aharon Oren Microbial Diversity and Microbial Abundance in Salt Saturated Brine: Why are the Waters of Hypersaline Lakes Red? - Post Theatre****9:30 Coffee Break - Officers' Club West Room****CONCURRENT SESSIONS****4. Algae & Cyanobacteria in Salt Lakes - South Room
Chair: William Henley & Juergen Polle****5. Ephemeral Lakes & Mineral Dust - North Room
Chair: Thomas Gill**

10:00 AM	M. Coleman	Oxygen Production and use in Benthic Mats of Solar Salt Ponds	S. Engelstaedter	Assessing the Role of Dust From Salt Lakes and Lake Deposits for the Global Dust Budget
10:20 AM	F. Kong	Characterization of a Picoplankton Isolated from Soda Lake in Inner Mongolia of China	T. Gill	Salt Flat Basin's Contribution to Regional Dust Production and Potential Influence on Dry Deposition in the Guadalupe Mountains (Texas)
10:40 AM	W. Henley	Global Phylogeography of Dunaliella	R. Reynolds	Crusts and Dusts at Playas in the Mojave Desert, USA

TUESDAY MAY 13th**CONCURRENT SESSIONS**

11:00 AM	J. Cushman	Exploring the use of Halophytic Green Algae for Biofuel Production	J. Gilbert	Geochemistry and Potential Playa Sources of the January 7, 2008 Southwestern New Mexico "Milky Rain"
11:20 AM	J. Polle	Carotenoid Biosynthesis In the Halophilic Alga <i>Dunaliella Salina</i> Teodoresco (Chlorophyta)	G. Breit	Relations of Trace Metals in Surface Salts to the Ground Water of Franklin Lake and the Ash Meadows Area of Nevada and California
11:40 AM			Z. Lai	Timing for the Evolution of Salt Lakes in the Qaidam Basin, Northwestern China

Noon Student Luncheon - University Guest House Meeting Room C**Noon Lunch****6. Algae & Ecosystems -****South Room***Chairs: Jasmine Saros & Courtney Salm***7. Mineral Industries & Salt Chemistry -****North Room***Chair: Tom Tripp*

1:20 PM	J. Saros	Biochemical Tools and Nutrient Assays Reveal Phytoplankton Nutrient Limitation by N, P, and Fe in Prairie Saline Lakes	Y. Zeng	Phase Diagram for Ternary System Containing Lithium, Sodium and Sulfate at 273 K
1:40 PM	C. Salm	Patterns of Phytoplankton Succession and Distribution in Prairie Saline Lakes of the Great Plains (USA)	T. Deng	Solid-Liquid Metastable Phase Equilibria in the Aqueous System of K_2SO_4 and $MgSO_4$ at 288 and 308 K
2:00 PM	A. Holz	Laboratory Study of Phytoplankton Nutrient Limitation Across a Salinity Gradient in Sandhills Lakes, NE	T. Tripp	Production of Magnesium from the Great Salt Lake
2:20 PM	J. Melack	Community Metabolism and Diel Variability in African Soda Lakes		

2:40 PM Coffee Break - Officers' Club West Room**6. Algae & Ecosystems (continued) -****South Room****7. Mineral Industries & Salt Chemistry****(continued) - North Room**

3:20 PM	H. Roney	Competitive Exclusion of Cyanobacteria in the Great Salt Lake	H. Ma	Development of Brine with Bischofite and other Elements after Extraction of Potassium from Salt Lake in China
3:40 PM	S. Bradt	Use of Remote Sensing to Track Phytoplankton in the GSL, Utah	S. Hurlbert	Political Correctness, Fear, Venality and Environmental Destruction
4:00 PM	L.A. Pautova	The Present-Day Central Caspian Sea Phytoplankton	Y. Li	Prediction of the Solubility of HCL-MgCL ₂ -H ₂ O System At -5°C Using the Ion-Interaction Model

4:30 PM Poster Session and Social - Officers' Club East Room**7:30 PM Student Career Panel - University Guest House Meeting Room C**

WEDNESDAY MAY 14th

8:45 AM Mid-Conference Field Trips to Great Salt Lake - Meet in Parking Lot of the University Guest House at 8:45 AM

7:30 PM Special Presentation A Great Salt Lake Photographic Survey by Michael Slade - Post Theatre

THURSDAY MAY 15th

8:30 AM Plenary Walt Baker The Long Road to Developing a Selenium Standard for Great Salt Lake (and Beyond) - Post Theatre

9:00 AM Plenary Nickolay Aladin The Aral Sea: Level, Salinity and the Creeping Changes in Biological Communities of an Endangered Ecosystem - Post Theatre

9:30 AM Coffee Break - Officers' Club West Room

CONCURRENT SESSIONS**8. Trace Metal Cycling - North Room****Chair: William Johnson****9. Biodiversity & Conservation - South Room****Chair: Brian Timms**

10:00 AM	D. Naftz	Sources and Geochemical Cycling of Selenium, Great Salt Lake, Utah	K. Hueso Kortekaas	Biodiversity of Inland Saltscapes of the Iberian Peninsula
10:20 AM	G. Dicataldo	Daily Changes in Dissolved Selenium in a Wetland of the Great Salt Lake: Occurrence and Causes	B. Timms	A Study of the Saline Lakes of the Esperance Hinterland, Western Australia, with Special Reference to the Role of Acidity
10:40 AM	D. Fernandez	Physical and Chemical Characterization of Particulates from the Great Salt Lake, Utah	B. Datson	The Effect of Salt on Germination of Samphire Species
11:00 AM	X. Diaz	Volatile Selenium Flux from Great Salt Lake, Utah	A. Eimanifar	Genetic Comparison of <i>Artemia franciscana</i> and an Iranian <i>Artemia</i> Stock From Maharlu Lake Using PCR-RAPD Technique
11:20 AM	W. Oliver	Estimating Selenium Removal by Sedimentation from Great Salt Lake, Utah	M. Kumar	A Study on Species Environment Relationship of Coposa Salar in the Higher Altitudes of Northern Chile
11:40 AM	W. Johnson	Selenium Mass Balance from the Great Salt Lake		

Noon Working Lunch: Workshop Research Agendas for Saline Lakes – Lessons Learned on How to Plan and Prioritize Technical Issues and Research Needs - Officers' Club South Room

Noon Lunch

8. Trace Metal Cycling (continued) - North Room**Chair: Dave Naftz****10. Bird Ecology & Conservation - South Room****Chair: Eric McCulley**

2:00 PM	H. Ohlendorf	Development of a Site-Specific Standard for Selenium in Open Waters of Great Salt Lake, Utah	D. Paul	Linking Communities, Wetlands and Migratory Birds – an Experiment in Salt Lake Bird Conservation
2:20 PM	K. Beisner	Selenium and Trace Element Mobility Affected by Periodic Interruption of Meromixis in GSL	R. Willson	Winter Populations of Bald Eagles (<i>Haliaeetus leucocephalus</i>) on Great Salt Lake

THURSDAY MAY 15th**CONCURRENT SESSIONS****8. Trace Metal Cycling (continued) - North Room**

2:40 PM	M. Brooks	Regulation of Selenium Flow Through Food Webs: Limits to Uptake by Phytoplankton and their Brine Shrimp Grazers
3:00 PM	M. Conover	Concentration of Mercury and Selenium on Great Salt Lake Birds and Effects on Avian Health

10. Bird Ecology & Conservation (continued) - South Room

J. Cavitt	Breeding Productivity of Waterbirds at Great Salt Lake: the Effects of Predators and Land Management
M. Ricca	Spatial use and Survival of Post-Hatchling Black-Necked Stilt Chicks in Re-created Salton Sea Shallow Water Wetlands

3:20 PM Coffee Break - Officers' Club West Room

3:40 PM	B. Marden	Selenium in Water, Seston, and <i>Artemia</i> from the Great Salt Lake, Utah from April 06 to August 07	N. Athearn	Avian Response to Salt Marsh Restoration at Former Salt Evaporation Ponds in San Francisco Bay, CA
4:00 PM			A. Manning	Intermountain West Aquatic Bird Survey
4:20 PM			E. McCulley	An Adaptive Management Approach to Optimizing Wetland Habitat for Birds Along the Shore of Great Salt Lake

4:30 PM Poster Session - Officers' Club East Room**4:30 PM Living Lakes Discussion - Officers' Club North Room****6:15 PM Banquet – This Is The Place State Park - Board Buses at 5:45 PM at the University Guest House****FRIDAY MAY 16th****8:30 AM Plenary Doug Barnum The Salton Sea: Integrated Science for Salvaging California's Largest Lake - Post Theatre****9:00 AM Coffee Break - Officers' Club West Room****CONCURRENT SESSIONS****11. Mercury & Other Contaminants - North
Chair: Nathan Darnall**

9:40 AM	B. Waddell	U.S. Fish and Wildlife Service Synoptic Evaluation of Contaminants Exposure
10:00 AM	N. Darnall	Dynamics of Mercury in Eared Grebes on the Great Salt Lake
10:20 AM	J. Parnell	Mercury and Sulfur Cycling in the Great Salt Lake
10:40 AM	K. Kuivila	Current-Use Pesticides in the Salton Sea, California
11:00 AM	J. Vest	Inorganic Contaminant Concentrations and Body Condition in Wintering Waterfowl

**12. Management & Education - South Room
Chair: Greg Reis**

E. Bucher	Managing Salt Lakes in the Neotropics: The Case of Mar Chiquita, Argentina
W. Wurtsbaugh	Eutrophication, Nutrient Fluxes, and Connectivity Between Bays of GSL
J.F. Carrasco Vayá	The Role of NGOs in the Conservation Management of Saltscapes in Spain
C. Trentelman	The Effect of Physical Traits of a Saline Lake on Residents Relationships with the Lake
K. Pearce	Lakeside Learning Program: Using GSL as an Outdoor Classroom with FRIENDS of Great Salt Lake

FRIDAY MAY 16th

CONCURRENT SESSIONS

**11. Mercury & Other Contaminants
(continued) - North**

**12. Management & Education (continued) -
South Room**

11:20 AM	J.E. Purvis	The Effects of Mining on a Salt Lake in the Western Australian Goldfields	H. Godsey	Scientific Inquiry for K-12 Students at Great Salt Lake
11:40 AM			K. Shaltout	Management of Lake Bardawil: a Hypersaline Lake in Sinai, Egypt

Noon Lunch – Slide Presentation by Rosalie Winard: An Itinerant Photographer of the Wetlands - Post Theatre

13. Geology & Geography - North Room

14. Invertebrates & Fish - South Room

Chair: Genevieve Atwood & Mianping Zheng

Chair: Robert Jellison

1:20 PM	G. Atwood	Shorezone Landforms of Shallow Closed-Basin Lakes, Evidence of Storm-Wind Strength and Direction	R. Jellison	Long-Term Shifts in <i>Artemia</i> Abundance Associated with Decreasing Salinity and Larval Recruitment Bottlenecks
1:40 PM	M. Zheng	Paleoenvironmental Records of Zabuye Salt Lake on the Tibetan Plateau, China, Since the Late Pleistocene	G. Van Stappen	<i>Artemia</i> of the Aral Sea, Uzbekistan: Field Survey of an Emerging Population and Perspectives for Commercial Exploitation
2:00 PM	C. Angeroth	Monitoring Bidirectional Density Driven Flow in Great Salt Lake, Utah	M. Hafezieh	The Effects of Drought on Reproduction Mode of <i>Artemia urmiana</i>
2:20 PM	E. Crosman	Climatology of Great Salt Lake Surface Temperature From MODIS	A. Asem	Resource Assessment of <i>Artemia</i> in the Urmia Lake in Rainy (1995) and Drought (2003) Years

2:40 PM Coffee Break - Officers Club West Room

**13. Geology & Geography (continued)
North Room**

**14. Invertebrates & Fish (continued)
South Room**

3:20 PM	W. White III	Fluid Chemistry and Mineralogy of Surficial Sediments in the Newfoundland Basin, Utah	J. Umek	Limnology and Aquatic Food Web Structure of a Large Terminal Lake
3:40 PM	M. Cobble	Qattara Depression - a New Salt Lake	S. Byers	Recovery of the Threatened Lahontan Cutthroat Trout in a Desert Terminal Lake
4:00 PM	W. Qi	Climate and Water-Level Change of Zabuye Salt Lake, Tibet	K. Wright	The Effects of Increasing Total Dissolved Solids on the Walker Lake, Nevada, Fishery
4:20 PM			F. Amat	Threatened <i>Artemia</i> Biodiversity in the Iberian and Western Mediterranean Region

4:50 PM Closing Ceremony - Post Theatre

POSTERS

Vilma Ardiles

Is there a Biennial Fluctuation of Phytoplankton Biomass in the Tropical, Saline Lake Alchichica.

Shyam Bajekal

Magnetotactic Bacteria from the Saline Alkaline Lonar Lake, India.

Yazidhi Bamutaze

The Impact of Environmental Change and Industrialization on Lake Katwe in South Western Uganda: Implications to the Livelihoods of the Local Communities.

Nicole Berthelemy-Okazaki

Effect of Mercury on the Brine Shrimp *Artemia* from the Great Salt Lake.

Jagat Kumar Bhusal

Bathymetric Maps and Dimensionless Depths of Some Major Lakes in Nepal.

Erdogan Cakir

Automated Ribotyping of Halophilic Bacteria Isolated from Different Hypersaline Environments In Turkey.

Peri Coleman

Alternative Stable States - a Tool for Monitoring Ecosystem Condition in Solar Saltfields.

Carmen Daggett

Iron Limitation in Saline Lakes of the Northern Great Plains.

Rohit Dave

The Phase Rule Study for the Recovery of Marine Chemicals from Sea Bittern.

Yaping Dong

Separation and Extraction of Strontium from Oil Field Brine of Nanyishan Region.

Kiyomet Guven

Isolation and Identification of Selenite Reducing Archaea from Tuz (Salt) Lake in Turkey.

Qinxian Jia

Changes in Biological Resource and Environment in the Decade of Gahai Salt Lake, China.

Tildon Jones

Management of the Great Salt Lake for Sustained *Artemia* Harvest and Ecosystem Conservation: An Overview of the Great Salt Lake Ecosystem Program.

Hatice Mehtap Kutlu

Analyses of Selenite Accumulating *Archaea* Isolated from Tuz (Salt) Lake in Turkey by Transmission Elektron Microscope.

Gheorghievici Liana

The Role of the Phytoplankters in Forming the Sediments from the Lakes with Pelogenous Potential.

Xifang Liu

The Study on Mineralization of Dangxiong Co Large Li-B Deposit, Tibet, China.

Ganchimeg Lkhagvajav

Physical-Chemical Characteristics of Lake Uvs, Mongolia.

Diana P. López-Anaya

Particulate C, N and P Dynamics in the Deep Tropical Lake Alchichica.

Stefania Maniatsi

A Population-Specific Marker within the Superspecies *Artemia franciscana*.

POSTERS

Qingfen Meng

The Research on Distributions of the Other Elements in Qarhan Potash Fertilizer Production Process.

Haydee Montoya Terreros

Algal and Cyanobacteria Saline Biofilms at the Coastal Grande Lagoon from Lima, Peru.

Mehmet Burcin Mutlu

Phenotypic and Genotypic Properties of Bacteria Isolated from Tuz Lake, Turkey.

Zhen Nie

Crystallization Path of Salts from Brine in Zabuye Salt Lake, Tibet, During Isothermal Evaporation.

Maria Guadalupe Oliva

Interannual Fluctuation of the Nitrogen-Fixing Cyanobacterial Bloom in Lake Alchichica, Central Mexico.

James Orlando

Seasonal Inputs of Dissolved and Sediment-Associated Pesticides to the Salton Sea, 2006-2007.

Luis Alberto Oseguera Perez

Export of Biogenic Carbon in a Tropical Saline Lake Dominated by Large Phytoplankton.

Leslie Patterson

Distribution of Woody Decomposer Fungi within the Great Salt Lake.

Kerri Pratt

Role of Dry Lake Bed Salts in Cloud Formation.

Stela Redon

Approach to the Role of Parasites on the Successful Invasion of Mediterranean Salterns by the Invasive *Artemia franciscana*.

Greg Reis

Ecological Scorecard of Mono Lake, California, USA.

Mayeli Sanchez

Could Resource Limitation Control Zooplankton Dynamics in a Saline Tropical Lake.

Baharak Sehatnia

A Study of Physicochemical Characterization of Urmia Lake (a Comparison Approach).

Zuoliang Sha

Solubility and Supersaturation of Lithium Carbonate of the Zabuye Salt Lake Brine.

Mary Ann Tiffany

Dramatic Blooms of *Prymnesium* sp. (*Prymnesiophyceae*) and *Alexandrium margalefii* (*Dinophyceae*) in the Salton Sea, California.

Rue Van Dyke

Carotenoids and Photoprotection in Great Salt Lake Halophiles.

Xuekui Wang

Construction and Operational Experience of Zabuye Salt Lake Solar Pond in Tibet, China.

Yuriy Yurchenko

The Ranking of Water Bodies of South of Ukraine by Hydrochemical and Biological Characteristics.

Daochen Zhu

The Important Role of Ectoine in the Fast Growth of Marine Bacterium *Salinivibrio Costicola* Subsp. *Yaniae*.

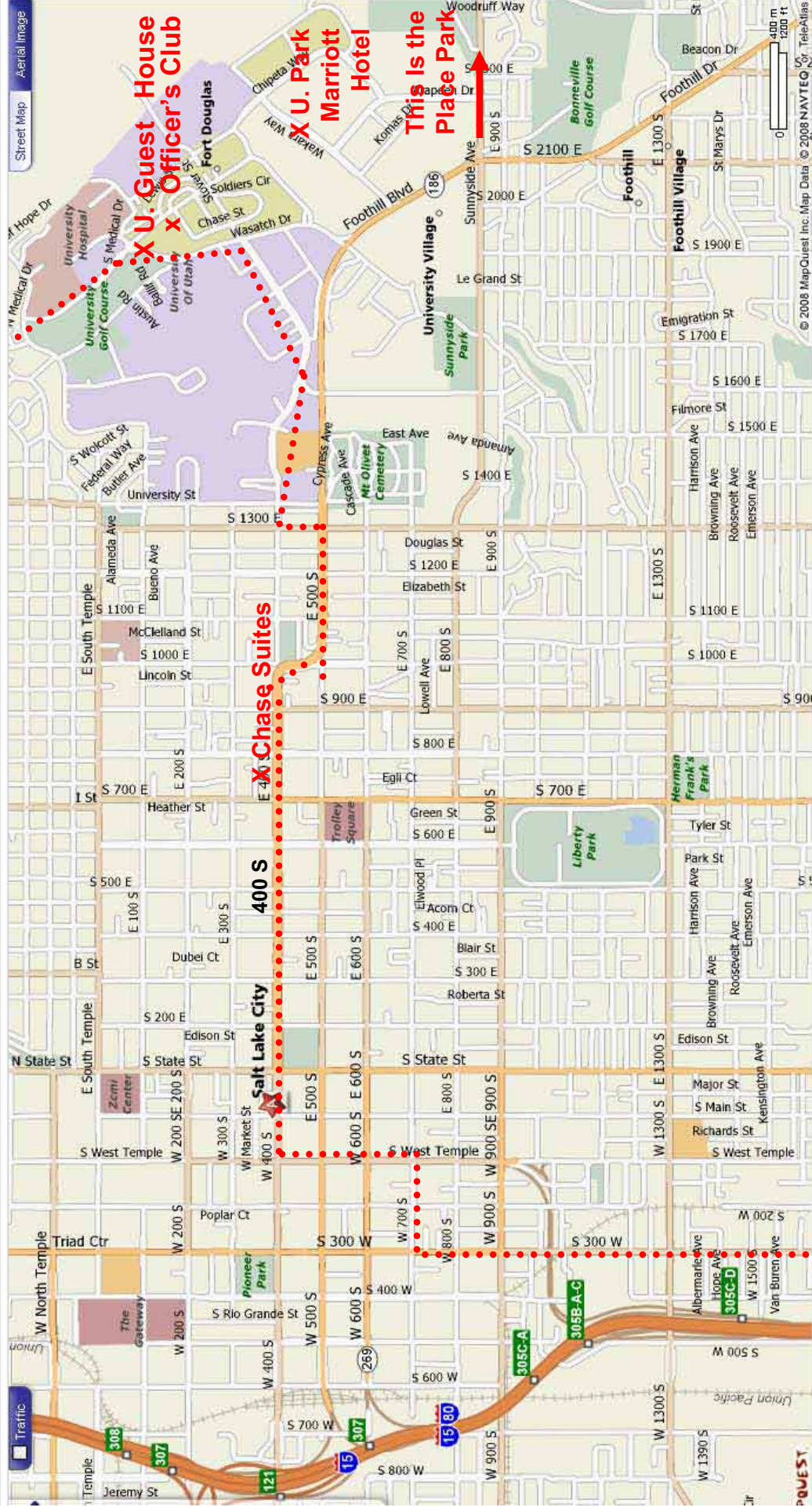
Michele D. Zwolinski

Phosphate and Phosphonate use by Microorganisms Isolated from Hypersaline Environments of the Great Salt Lake, Utah

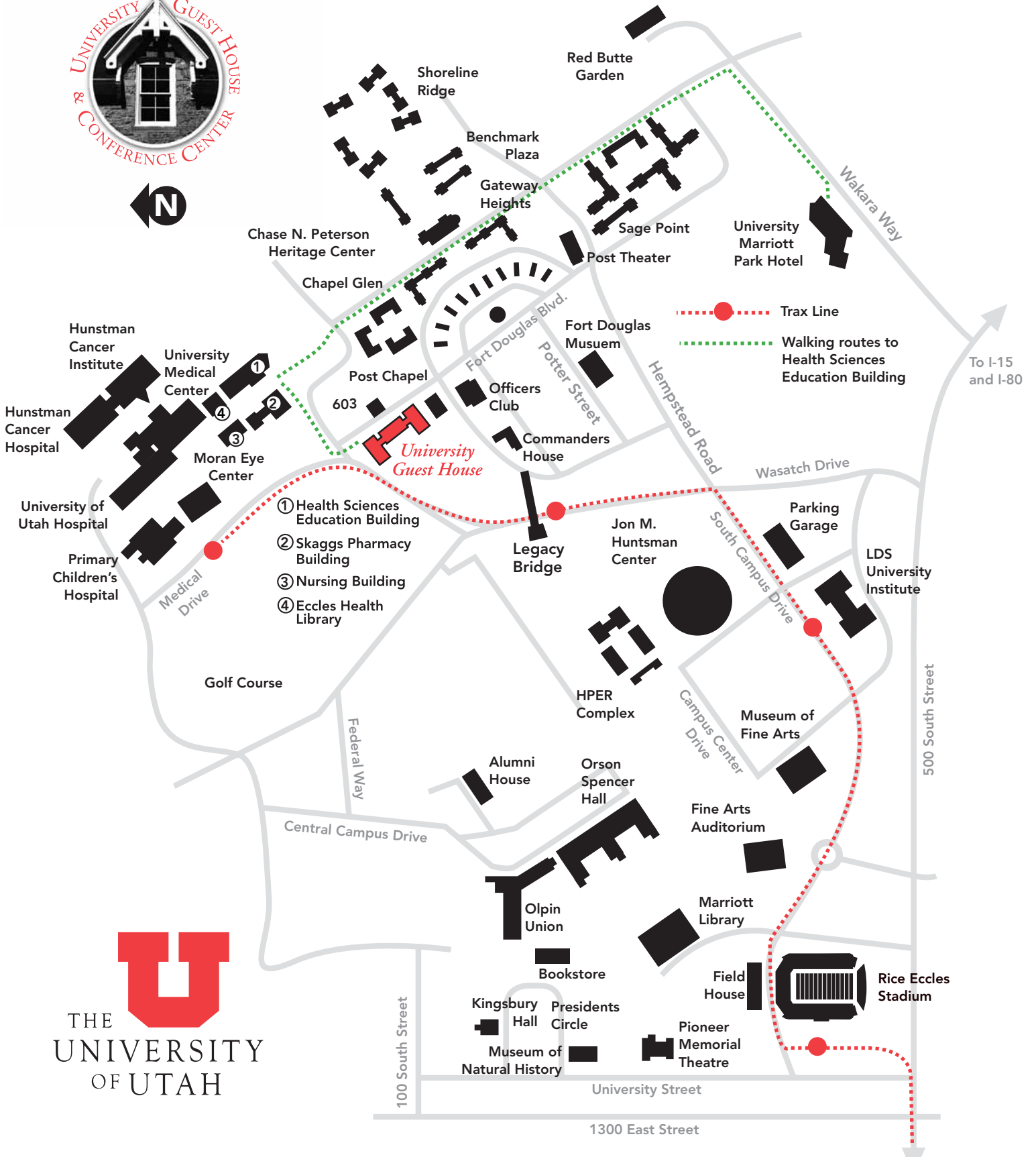
Abatzopoulos, TJ	58	Chapman, DS	48	Hankuliev, K	50
Adams, WJ	40	Chavadar, MS	37	Hayes, DF	46
Aladin, N	15	Ciros-Pérez, J	72	Henley, WJ	50
Albion, RL	44	Cirpan, C	49,55	Herbst, DB	51
Alcocer, J	36,57,63,65,72	Cline, C	78	Hernandez-Gomez, L	44
Al-Rshaidat, MMD	44,72	Cobble, MH	42	Herrera, V	54
Amat, F	35,69	Coleman, M	43,45	Hertel, T	48
Anderson, TW	35,60,70	Coleman, PSJ	43	Hinderberger, E	43
Angeroth, CE	35	Conko, K	79	Hindiye, MY	64
Ardiles, V	36	Conover, MR	43,77	Hoenicke, R	19
Asem, A	36,73	Crosman, ET	43	Holz, AA	51
Asem, H	36	Cross, VA	61	Holz, JC	51
Athearn, ND	36	Cui, XM	60	Hontoria, F	35,69
Atwood, G	37	Curto, E	40	Hooker, P	77
Avery, BJ	70	Cushman, JC	44	Horel, JD	43
Bagale, LN	39	Daggett, C	44	Hosseinpour, H	50
Bajekal, SS	37	Dalmet, SA	56	Hoven, HM	51,60
Baker, W	14	Darnall, NL	44,78	Huang, W	74,78
Ballatore, TJ	37	Datson, B	45	Hueso Kortekaas, K	42,52
Bamutaze, Y	38	Dave, RH	45	Hurlbert, SH	52,75
Barnum, DA	16,35,60,70	Deckert, R	66	Ingraham, D	39
Bart, J	58	Degenhardt, AE	69	Jellison, R	11,52
Baxevanis, AD	58	DenBleyker, J	63	Jia, Q	53,54
Baxter, BK	38,56,70,77	Deng, M	72	Johnson, WP	38,46,
Beisner, KR	38,61	Deng, T	45	47,48,53,61,64	
Béjà, O	64	Diaz, X	38,46,47,53,61,64	Jones, BF	79
Belnap, DM	73	Dicataldo, G	46	Jones, BH	69
Belovksy, G	53	Domek, MJ	73	Jones, MT	53
Ben-Amotz, A	68	Dong, Y	55	Kappas, I	58
Berrios, V	54	Dong, YP	46,60	Kenney, TA	35
Berthelemy-Okazaki, N	39	Eimanifar, A	47,73	Kirkwood, AE	50
Bhusal, JK	39	Engelstaedter, S	47	Kohler, JF	79
Birdsey, P	53	Escobar, E	65	Kong, F	53,54
Bleiweiss, M	48	Feingersch, R	64	Kuivila, KM	54,64
Bodaker, I	64	Fernandez, DP	47	Kumar, M	54
Bogle, R	70	Frey, B	48	Kutlu, M	55
Borrok, D	48	Fuller, C	64	Lai, Z	55
Bosteels, T	77	Fulton, R	70	Lane, M	48
Bowcutt, KM	63	Ganesan, B	66,71,78	Lehmann, C	48
Bradt, SR	39,80	Garrett, M	75	Lemos, M	44
Breit, GN	40,70	Gavrieli, I	12	Li, F	58
Brix, KV	40	Gay, D	48	Li, W	46,55,60
Brooks, ML	40	Georgiev, B	69	Li, Y	55
Brownstein, JD	76	Gessaman, JA	79	Li, YH	46
Bucher, EH	40	Ghosh, PK	45	Liana, G	56
Buchheim, JA	50	Gilbert, J	48	Lingzhong, B	62
Buchheim, MA	50	Gill, TE	48	Litchfield, CD	56
Butler, J	53	Gillevet, PM	56	Liu, JY	81
Byers, S	41	Godsey, HS	48	Liu, X	56
Byron, ER	41	Goldstein, HL	40,70	Lkhagvajav, G	57
Cakir, E	41	Goncharov, AYU	49,80	Loe, H	17
Canova, T	63	Griffith, JD	38	López-Anaya, DP	57
Carrasco Vayà, JF	42	Gunchin, N	49	Lowenstein, TK	57,73
Cavitt, JF	42,60	Guven, K	41,49,55,61	Luft, J	43,53,77
Chandra, S	76	Hafezieh, M	47,50	Lugo, A	63,72

Luton, C	41	Oseguera-Perez, LA	36,63,65	Spring, SE	60,70
Ma, H	55,58	Osman, O	65	Steidinger, K	75
Maccari, M	35,69	Panda, U	65	Stephens, D	53
Madon, S	60	Parnell, J	66,71,78	Stolp, BJ	61
Mahmoodi, A	36	Patterson, LA	66	Sun, Z	78
Mahowald, N	47	Paul, DS	53,67	Swan, BK	69,75
Majaliwa, MJ	38	Pautova, LA	67	Takekawa, JY	36
Malkawi, HI	64	Pearce, K	67	Tanabe-Hosoi, S	65
Maniatsi, S	58	Peralta, L	63	Tiffany, MA	75
Manning, AE	58	Perez, AE	48	Timms, BV	75
Marden, B	36,50,59,77	Perschon, C	43,53,77	Timofeeff, MN	57,73
Martin, CS	71	Polle, JEW	68	Tran, D	68
Martin, RS	62	Powers, DW	38	Trentelman, CK	76
McComb, J	45	Prather, KA	68	Tripp, GT	76
McCulley, E	59	Pratt, KA	68	Twohy, CH	68
McKay, RM	44,72	Purvis, JE	45,68	Umek, JW	76
Meckstroth, AM	60,70	Qi, W	68	Valentine, DL	75
Medina, G	35	Redon, S	35,69	Van Dyke, R	77
Melack, JM	59	Reheis, MC	70	Van Leeuwen, J	53
Meney, K	45	Reifel, KM	69,75	Van Stappen, G	50,77
Meng, QF	46,60	Reis, GJ	69	Vasileiadou, K	58
Merino, M	57	Reynolds, RL	40,70	Vasileva, G	69
Mianping, Z	56,62	Rezvani, S	47	Velasco, M	70
Miles, AK	35,44,60,70	Ricca, MA	35,60,70	Vest, JL	43,77
Miller, B	69	Riddle, MR	70	Vilaclara, G	36,65
Miller, T	46,51,60,63	Ríos, N	54	Vostokov, SV	67
Mirabdullayev, I	50,77	Rompato, G	66,71,78	Waddell, B	78
Moellmer, WO	46,63	Roney, H	71	Wang, X	55,74,78
Mohanty, PK	65	Rosenberg, M	64	Wang, YQ	65
Montoya Terreros, H	61	Salm, CR	55,71,72	Webster, DM	79
Moore, TS	39	Sanchez, M	72	Webster, TN	77
Mosley, R	53	Sang, SH	72	Weimer, B	66,71,78
Muhandiki, VS	37	Saros, JE	44,71,72	Wenger, D	79
Mutlu, MB	41,49,55,61,64	Savage, N	73	White III, WW	79
Naftz, DL	35,38, 39,46,47,48,53,61,80	Scadden, JL	82	Willcox, S	38
Nagata, S	65,81	Schubert, BA	57,73	Wilson, R	79
Navarro, JC	35,69	Sehatnia, B	73	Winard, R	20
Neill, J	53	Sessions, CL	82	Wolny, J	75
Nelson, R	38	Sevier, MR	40	Wong, H	53
Neville, A	62	Sha, Z	55,74,78	Wright, KA	80
Ni, S	72	Shaltout, KH	74	Wurtsbaugh, WA	39,80
Nichols, JP	82	Sharon, I	64	Ye, XS	60
Nicholson, BT	62	Shen, PS	73	Yin, H	72
Nie, Z	62,78	Shinn, JM	36	Yongsheng, Z	62
Norgyal, T	77	Shirshov, PP	67	Yount, JC	40,70
O'Neale, CM	79	Sikaroodi, M	56	Yuan, HR	81
Oberg, CJ	63,73,82	Silkin, VA	67	Yuanyi, Z	74
Ohlendorf, HM	41,63	Skipp, G	70	Yurchenko, YY	80
Oliva, MG	63	Slade, M	18	Zeng, Y	81
Oliver, W	46,64	Smalling, KL	54,64	Zheng, MP	54,68,81
Oren, A	13,64	Song, P	55	Zholdasova, I	50,77
Orlando, JL	54,64	Sorgeloos, P	50,77	Zhu, D	65,81
		Spall, R	74	Zwolinski, MD	63,73,82

Trax rail system



The meeting will be held at Fort Douglas. The Officer's Club, the Post Theatre, and the University Guest House are all on Fort Douglas Boulevard. Take Wasatch Dr., turn right on Medical Drive, and then right on Fort Douglas Boulevard. Parking for meeting is in the lot south of the Officer's Club.



PROGRAM OF EVENTS - QUICK LIST

DAY ONE – SUNDAY, MAY 11th		
Registration and Opening Social	5:30 PM -7:30 PM	Officers' Club
DAY TWO – MONDAY, MAY 12th		
Opening Ceremony	8:00 AM – 8:45 AM	Post Theatre
Robert Jellison - Plenary	8:45 AM – 9:30 AM	Post Theatre
Coffee Break	9:30 AM – 10:00 AM	Officers' Club West Room
Session 1: Microorganisms	10:00 AM – 11:40 AM	Officers' Club North Room
Session 2: Physical-Chemical	10:00 AM - Noon	Officers' Club South Room
Lunch	Noon – 1:20 PM	
Session 1B: Microorganisms	1:20 PM – 5:00 PM	Officers' Club North Room
Session 3: Wetlands	1:20 PM – 5:00 PM	Officers' Club South Room
Coffee Break	2:40 PM – 3:20 PM	Officers' Club West Room
Environmental Education Forum	4:00 PM – 5:00 PM	Post Theatre
ISSLR Member Meeting	5:20 PM - 7:00 PM	Officers' Club South Room
Presentation – Hikmet Loe	7:30 PM – 8:30 PM	Post Theatre
DAY THREE – TUESDAY, MAY 13th		
Ittai Gavrieli - Plenary	8:30 AM – 9:00 AM	Post Theatre
Aharon Oren - Plenary	8:30 AM – 9:00 AM	Post Theatre
Coffee Break	9:30 AM – 10:00 AM	Officers' Club West Room
Session 4: Algae & Cyanobacteria	10:00 AM – 11:40 AM	Officers' Club South Room
Session 5: Ephemeral Lakes	10:00 AM - Noon	Officers' Club North Room
Student Luncheon	Noon – 1:20 PM	University Guest House - Meeting Room C
Lunch	Noon – 1:20 PM	
Session 6: Algae & Ecosystems	1:20 PM – 4:20 PM	Officers' Club South Room
Session 7: Mineral Industries	1:20 PM – 4:00 PM	Officers' Club North Room
Coffee Break	2:40 PM – 3:20 PM	Officers' Club West Room
Poster Session and Social	4:30 PM – 8:00 PM	Officers' Club East Room
Student Career Panel	7:30 PM – 9:00 PM	University Guest House - Meeting Room C
DAY FOUR – WEDNESDAY, MAY 14th		
Mid-Conference Field Trips (Meet in Parking Lot University Guest House) 8:45 AM		
Presentation – Michael Slade	7:30 PM – 9:00 PM	Post Theatre
DAY FIVE – THURSDAY, MAY 15th		
Walt Baker - Plenary	8:30 AM – 9:00 AM	Post Theatre
Nickolay Aladin - Plenary	9:00 AM – 9:30 AM	Post Theatre
Coffee Break	9:30 AM – 10:00 AM	Officers' Club West Room
Session 8: Trace Metal Cycling	10:00 AM – 4:20 PM	Officers' Club North Room
Session 9: Biodiversity	10:00 AM – 11:40 AM	Officers' Club South Room
Working Lunch – Research Agendas	Noon – 2:00 PM	Officers' Club South Room
Lunch	Noon – 2:00 PM	
Session 10: Bird Ecology	2:00 PM – 4:30 PM	Officers' Club South Room
Coffee Break	3:20 PM – 3:40 PM	Officers' Club West Room
Poster Session	4:30 PM – 6:00 PM	Officers' Club East Room
Living Lakes Discussion	4:30 PM – 6:00 PM	Officers' Club North Room
Banquet - This is the Place Heritage Park (Meet in Parking Lot University Guest House) 5:30 PM		
DAY SIX – FRIDAY, MAY 16th		
Doug Barnum - Plenary	8:30 AM – 9:00 AM	Post Theatre
Coffee Break	9:00 AM – 9:40 AM	Officers' Club West Room
Session 11: Contaminants	9:40 AM – 11:40 AM	Officers' Club North Room
Session 12: Management	9:40 AM - Noon	Officers' Club South Room
Presentation – Rosalie Winard	Noon – 1:20 PM	Post Theatre
Lunch	Noon – 1:20 PM	
Session 13: Geology & Geography	1:20 PM – 4:20 PM	Officers' Club North Room
Session 14: Invertebrates & Fish	1:20 PM – 4:30 PM	Officers' Club South Room
Coffee Break	2:40 PM – 3:20 PM	Officers' Club West Room
Closing Ceremony	4:50 PM	Post Theatre