The Salton Sea Centennial Symposium
Celebrating a Century of Symbiosis among Agriculture, Wildlife and People, 1905 - 2005

A Salton Sea for the 21st Century:
Science, Rehabilitation, Management

Sponsored by:
USGS Salton Sea Science Office, San Diego State University Center for Inland Waters, California
Department of Water Resources and the Water Education Foundation

Hilton San Diego Mission Valley, San Diego, California
March 30-April 1, 2005

SYMPOSIUM PROGRAM, revised Mar 17, 22

Douglas A. Barnum, Acting Chief Scientist, USGS Salton Sea Science Office
Stuart H. Hurlbert, Director, SDSU Center for Inland Waters
Co-Chairmen

WEDNESDAY, MARCH 30

7:00 am  Registration

8:00 am  Welcome and Opening Remarks
Rita Schmidt Sudman, Executive Director, Water Education Foundation

8:10 am  Morning Session Stuart Hurlbert, SDSU, moderator

8:15 am  Overview of Salton Sea science and rehabilitation issues
Douglas Barnum

8:30 am  Fish and fish-eating birds at the Salton Sea: a century of boom and bust
Allen H. Hurlbert, Thomas W. Anderson, Kenneth Sturm and Stuart H. Hurlbert

8:55 am  The Salton Sea fisheries: the good, the bad, and the unexpected
John J. Crayon, Sharon Keeney and Robert A. Schrag

9:15 am  Post-2000 trends in migratory waterbirds utilizing the Salton Sea, California
Thomas W. Anderson and Tahni Johnson

9:35 am  Salton Sea International Avian Airport: bird band data and their indications of importance of the
Salton Sea for migratory birds
Timothy P. Krantz

9:55 am  Break

10:25 am  Selenium, arsenic, and other contaminants in Salton Sea fish and their potential impacts on
human consumers and wildlife
Marie F. Moreau, Janie Surico-Bennett, Marie Vicario-Fisher, Russell Gerads, Richard M.
Gersberg, and Stuart H. Hurlbert

10:50 am  Distribution and abundance of Salton Sea ichthyoplankton, 1987-1989
Margaret L. Matsui, Jerry F. Downhower and Alan B. Bond

11:10 am  Effect of environmental conditions on salinity tolerance in fish
Colin J. Brauner and Brian A. Sardella

11:30 am  Predation on the endangered desert pupfish by nonnative fishes in the Salton Sea basin
Barbara A. Martin and Michael K. Saiki
Fish communities in the agricultural drains and shallow water habitats of the Salton Sea: re-thinking the threats to desert pupfish  
*John J. Crayon and Sharon Keeney*

Springtime abundance of the pileworm *Neanthes succinea* at the Salton Sea, California, 1999 vs 2004, with observations on salinity stratification  
*Deborah M. Dexter, Joan S. Dainer, Paul M. Detwiler, Marie F. Moreau, and Stuart H. Hurlbert*

**Lunch co-sponsored by EDAW, Inc.**  
**Speaker:** Rep. Bob Filner, D-San Diego  
*The Salton Sea: Getting the Federal Government Involved*

**Afternoon Session** Douglas A. Barnum, moderator  
**Keynote speaker:** Dr. Enrique Bucher, Universidad Nacional de Córdoba, Argentina: *Mar Chiquita, Salton Sea's Sister: Status of a 5000 km² Saline Lake in Northern Argentina*

Projection of future selenium concentrations in drainage from the Imperial Valley  
*John L. Scott*

Impacts of perchlorate in the Colorado River system on the Salton Sea  
*G. Chris Holdren*

Distribution and transport of sediment-associated current-use pesticides in the Salton Sea watershed, California  
*Kathy M. Kuivila and L.A. LeBlanc*

**Break**

Properties and distribution of sediment in the Salton Sea, California  
*Michael A. Anderson, Laska Whiteaker, Elisha Wakefield and Christopher Amrhein*

Plankton dynamics of the Salton Sea, 1997-1999  
*Mary Ann Tiffany, Maria R. González, Brandon K. Swan, Kristen M. Reifel, James M. Watts and Stuart H. Hurlbert*

Salinity and fish effects on Salton Sea microecosystems: phytoplankton and periphyton  
*Maria R. González, Cheryl M. Hart, Paul Simpson, Ruben Lara, and Stuart H. Hurlbert*

Eutrophication and cycling of nitrogen and phosphorus in a highly saline lake, the Salton Sea, California  
*Stuart H. Hurlbert, James M. Watts, Brandon K. Swan, and Lisa Thurn*

**Adjourn**

**Welcoming Reception and Poster Session** (hosted; list of posters below)  
*Poster Tours: At 6:30, 7:00, and 7:30 pm, small groups will visit the posters in sequence, and each poster presenter will give - in 2 minutes! - their poster's main messages.*

**THURSDAY, MARCH 31**

**Morning Session** Phil Pryde, SDSU, and Bob Ross, USGS, moderators  
**Keynote speaker:** Dr. Philip Micklin, University of Western Michigan: *History, Status, and Lessons of the Aral Sea*

Long-term changes in the phosphorus loading to and trophic state of the Salton Sea  
*Dale M. Robertson, S. Geoffrey Schladow, and G. Chris Holdren*
A conceptual model for nutrient cycling in the Salton Sea
*S. Geoffrey Schladow, Joaquim Perez-Losada, Dale M. Robertson and Eu Gene Chung*

Response in the eutrophication of the Salton Sea to changes in phosphorus loading: an empirical modeling approach
*Dale M. Robertson and S. Geoffrey Schladow*

A linked hydrodynamic and water quality model for the Salton Sea: predicting the response trajectory of nutrient load reduction
*Eu Gene Chung, Joaquim Perez-Losada, S. Geoffrey Schladow and Dale M. Robertson*

Break

Microalgae cultivation for nutrient remediation of the Salton Sea
*David E. Brune, G. Schwartz, J.C. Van Olst, M. J. Massingill and J. R. Benemann*

Chemical treatments of irrigation and drain waters to reduce eutrophic conditions in the Salton Sea
*Christopher C. Goodson, L. Brooke Mason, G. Schwartz, D. Cain, A. Kalin and C. Amrhein*

Sulfide eruptions and gypsum blooms in the Salton Sea as detected with SeaWiFS satellite imagery, 1998-2004
*Mary Ann Tiffany, Susan L. Ustin and Stuart H. Hurlbert*

The mechanisms leading to fish kills in the Salton Sea as revealed by remote sensing
*Belen Marti, Todd E. Steissberg, Simon J. Hook and S. Geoffrey Schladow*

Lunch

Speaker: Rep. Mary Bono, R-Palm Springs (invited)

Continuous measurement of the thermal structure of the Salton Sea
*Sveinn O. Palmarsson and S. Geoffrey Schladow*

Influence of the Salton Sea on the surrounding terrestrial ecosystem
*William I. Boarman*

Air pollution and atmospheric dry deposition in the vicinity of the Salton Sea
*Rocio Alonso, Andrzej Bytnerowicz and William I. Boarman*

Soils of the Salton Sea basin
*Michael F. Allen, Tracy Tennant and William I. Boarman*

Allochthonous inputs from the Salton Sea to the terrestrial biota

A dusty future for the Salton Sea? Lessons learned from Mono and Owens lakes
*Thomas E. Gill and Thomas A. Cahill*

Break

Speaker: Michael Chrisman, Secretary, California Resources Agency

Panel Discussion: The Link Between Water Supply, Science, Restoration and The Law
Steve Robbins, General Manager, Coachella Valley Water District
Jesse Silva, General Manager, Imperial Irrigation District
Ron Enzweiler, Executive Director, Salton Sea Authority
Kim Delfino, Director of the California Program, Defenders of Wildlife
Moderator: Rita Schmidt Sudman, Executive Director, Water Education Foundation

What are the prospects for establishing legal guarantees for minimum needed inflows to the Salton Sea? If they are poor, can the expense of a large project that will depend on such inflows be justified? Who should be responsible for long-term mitigation of environmental impacts of a no-action alternative or of a rehabilitation project?

5:45 pm  
Adjourn

6:15  
Hosted Reception in Poster Room
Coursey of The President’s Leadership Fund, San Diego State University

7:00 pm  
An Evening in Central Asia – Special presentation on the Aral Sea region

Delegation of the SABIT GROUP PROGRAM, U.S. Dept. Commerce
Water Resource Management For Central Asia
Nemat Abidshayev  
Namangan, Uzbekistan
Murtozkul Alimov  
Jizzak, Uzbekistan
Dowran Basarov  
Ashaqabat, Turkmenistan
Ashikhammut Ibraymov  
Tashkent, Uzbekistan
Zair Jurabekov  
Samarkand, Uzbekistan
Giniyat Kenzhegaliev  
Uralsk, Kazakhstan
Kiyospek Kobegenov  
Semipalatinsk, Kazakhstan
Bissen Kuanov  
Atyrau, Kazakhstan
Alexander Londarev  
Dashoguz, Turkmenistan
Serikbai Sagimbayev  
Kizilorda, Kazakhstan
Ashyrylych Tachnazarov  
Ashaqabat, Turkmenistan
Mahmadzarif Sharipov  
Sogd region, Tajikistan
Nosirdjon Tohirov  
Sogd, Tajikistan
Abduvali Umirzakov  
Payarik, Uzbekistan
Arman Zholdasbekov  
Almaty, Kazakhstan

Poster Tours: As last evening, or by demand

FRIDAY, APRIL 1

8:30 am  
Special Guest: State Sen. Denise Ducheny-Moreno, D-San Diego
The Salton Sea: A Treasure, Not Trash

8:45 am  
Keynote Speaker: Dr. José Campoy-Favela, Director, Reserva de la Biosfera Alto Golfo de California y Delta del Rio Colorado, San Luis, Sonora
Wetlands and Parallel Crises in The Colorado River Delta Region of Mexico

9:30 am  
Groundwater availability near the Salton Sea
Andrew F. B. Tompson, Zafer Demir, G. Bryant Hudson, Denise L. Mason, Peter F. Mckereghan, Jean E. Moran, Dennis E. Watt and Ananda Wijesinghe

9:50 am  
Integrated modeling of water policy futures in the Imperial-Mexicali Valley
Michael E Kjelland, Craig B. Forster, William E. Grant and Kimberly Collins

10:10 am  
Break

10:40 am  
And if we do nothing? A projection of future conditions at the Salton Sea
Michael Cohen
11:05 am  Fundamentals of estimating the net benefits of ecosystem preservation: the case of the Salton Sea  
*Kurt Schwabe and Nermin Nergis*

11:25 am  A critical review of rehabilitation proposals  
*Michael Cohen and Douglas A. Barnum*

11:50 am  The myth of too much science  
*Stuart H. Hurlbert*

12:00  **Closing Remarks:** Douglas Barnum

12:15 pm  Adjourn

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**POSTER PRESENTATIONS**

Movement patterns and survival of healthy and botulism rehabilitated California Brown Pelicans of the Salton Sea  
*Charles A Pelizza, A. Laurie Harvey, Daniel W. Anderson, Franklin Gress, Paul R. Kelly and Thomas W. Anderson*

Nest-site characteristics and hatching success of Snowy Plovers (*Charadrius alexandrinus nivosus*) at the Salton Sea  
*Kathy C. Molina and William I. Boarman*

Status of bird conservation planning in the Southwest in relation to the Salton Sea  
*Marti Kie*

Relation of desert pupfish abundance to selected environmental variables in natural and manmade habitats in the Salton Sea basin  
*Barbara A Martin and Michael K. Saiki*

Phytoflagellates from the Salton Sea  
*Steven B. Barlow and Paul Kugrens*

Phytoplankton composition and abundance in the Salton Sea determined by microscopy and pigments  
*Kristen M. Reifel, Brandon K. Swan, Mary Ann Tiffany, Chuck C. Trees and Stuart H. Hurlbert*

Influence of river inflows on plankton distribution around the southern perimeter of the Salton Sea, California  
*Kristen M. Reifel, Brandon K. Swan, Errel Olivo, James M. Watts, Charles C. Trees and Stuart H. Hurlbert*

The light regime of the Salton Sea, California, 1997-1999  
*Brandon K. Swan, Mary Ann Tiffany, James M. Watts, Kristen M. Reifel and Stuart H. Hurlbert*

A comparison of "sulfide" eruptions in Namibia and the Salton Sea using the MODIS terra platform  
*Mary Ann Tiffany*

Sulfide eruptions and gypsum blooms in the Salton Sea as detected with SeaWiFS satellite imagery, 1998-2004  
*Mary Ann Tiffany, Susan L. Ustin and Stuart H. Hurlbert*

Laboratory tests of sediment and phosphorus removal in Salton Sea tributaries  
*L. Brooke Mason, C. Amrhein and C.C. Goodson*

A multivariate analysis of selenium distribution in nearshore sediments of the Salton Sea with implications for restoration planning
Douglas A. Barnum, Carla R. Scheidlinger and John Chestnut
Planning for shallow water habitat at the Salton Sea, California, USA: a scientific consensus
Carla R Scheidlinger and Douglas A. Barnum

Mapping the Salton Sea bottom sediments using dual frequency acoustics
Pat Chavez, Karl Rhynas and Miguel Velasco

Imperial County Farm Bureau’s voluntary TMDL compliance program: farmers working to reduce silt from leaving their fields
Allison D. Allen and Al K. Kalin

A study of wind characteristics and air quality in the Salton Sea region using data collected by CARB and CIMIS meteorological stations
Pat Chavez, Rian Bogle and Jana Ruhlman

The Salton Sea, water supplies, population growth, and the U.S. Congress
Hurlbert Stuart H., Joan S. Dainer, Dick Schneider and Ben Zuckerman