

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

- 11:50 am 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
- 12:10 pm 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
- 12:30 pm Lunch co-sponsored by EDAW, Inc.**
Speaker: Rep. Bob Filner, D-San Diego
The Salton Sea: Getting the Federal Government Involved
- 2:00 pm 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***
- 2:45 pm Projection of future selenium concentrations in drainage from the Imperial Valley
John L. Scott
- 3:05 pm Impacts of perchlorate in the Colorado River system on the Salton Sea
G. Chris Holdren
- 3:25 pm Distribution and transport of sediment-associated current-use pesticides in the Salton Sea watershed, California
Kathy M. Kuivila and L.A. LeBlanc
- 3:45 pm **Break**
- 4:05 pm Properties and distribution of sediment in the Salton Sea, California
Michael A. Anderson, Laska Whiteaker, Elisha Wakefield and Christopher Amrhein
- 4:25 pm 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
- 4:50 pm 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
- 5:10 pm 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
- 5:30 pm Adjourn**
- 6:00 pm 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

- 8:30 am 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
- 9:15 am 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

- 9:35 am A conceptual model for nutrient cycling in the Salton Sea
S. Geoffrey Schladow, Joaquim Perez-Losada, Dale M. Robertson and Eu Gene Chung
- 9:55 am Response in the eutrophication of the Salton Sea to changes in phosphorus loading: an empirical modeling approach
Dale M. Robertson and S. Geoffrey Schladow
- 10:15 am 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
- 10:35 am **Break**
- 11:05 am 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
- 11:25 am 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
- 11:45 am Sulfide irruptions 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
- 12:05 pm 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
- 12:25 pm **Lunch**
Speaker: Rep. Mary Bono, R-Palm Springs (invited)
- 2:00 pm **Afternoon Session** Chris Amrhein, UC Riverside, moderator
- 2:00 pm Continuous measurement of the thermal structure of the Salton Sea
Sveinn O. Palmarsson and S. Geoffrey Schladow
- 2:20 pm Influence of the Salton Sea on the surrounding terrestrial ecosystem
William I. Boarman
- 2:25 pm Air pollution and atmospheric dry deposition in the vicinity of the Salton Sea
Rocio Alonso, Andrzej Bytnerowicz and William I. Boarman
- 2:40 pm Soils of the Salton Sea basin
Michael F. Allen, Tracy Tennant and William I. Boarman
- 2:55 pm Allochthonous inputs from the Salton Sea to the terrestrial biota
Cheryl S. Brehme, William I. Boarman, Robert N. Fisher, Mark B. Mendelsohn, Anita T. Herring, Lisa A. Lyren, Krista Pease, Matt Rahn, Carlton J. Rochester, Drew C. Stokes and Stacie A. Hathaway
- 3:15 pm A dusty future for the Salton Sea? Lessons learned from Mono and Owens lakes
Thomas E. Gill and Thomas A. Cahill
- 3:35 pm **Break**
- 4:00 pm **Speaker:** Michael Chrisman, Secretary, California Resources Agency
- 4:15 pm **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**
Courtesy 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	Ashgabat, Turkmenistan
Ashikmamuṭ Ibraymov	Tashkent, Uzbekistan
Zair Jurabekov	Samarkand, Uzbekistan
Giniyat Kenzhegaliev	Uralsk, Kazakhstan
Kiyspek Kobegenov	Semipalatinsk, Kazakhstan
Bissen Kuanov	Atyrau, Kazakhstan
Alexandr Londarev	Dashoguz, Turkmenistan
Serikbai Sagimbayev	Kizilorda, Kazakhstan
Ashyrklych Tachnazarov	Ashgabat, 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 **Morning Session** Geoff Schladow, UC Davis, moderator

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 Río 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**

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 irruptions 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