

**Salton Sea Science Subcommittee**

**Request for Proposals**

**to Provide**

**Baseline Environmental Data**

**to Support Development of a**

**Salton Sea Remediation Project**

**Month Day, 1998**

## Study Site

*include New & Alamo Rivers,  
potential pumpout basins*

The Salton Sea is a hypersaline lake located in a closed basin of the southern California desert; it is the largest body of water within California. The Sea was initially formed in 1905-1907 by flooding on the Colorado River which breached an irrigation control structure allowing virtually the full flow of river water into the Salton Basin. The Sea's current existence is primarily due to agricultural drainage from the Imperial, Coachella, and Mexicali Valleys; smaller volumes of municipal effluent and stormwater runoff also flow to the Sea.

The Salton Sea is home to a highly eutrophic ecosystem including a highly productive sportfishery. The Sea, and wetlands along its shoreline, are a critical part of the Pacific flyway providing homes and seasonal refuge to millions of birds of hundreds of species. Several endangered species, including the desert pupfish and the Yuma clapper rail, inhabit the Salton Sea and/or adjacent habitats.

The Salton Sea ecosystem is under stress. Inevitably increasing salinity (currently about 43 ppt) may be threatening the reproductive ability of some parts of the biota particularly the sportfish species. High nutrient loading creates high productivity but also periods of low oxygen and possibly blooms of toxic algae. Elevated selenium (derived from the Colorado River water used to irrigate the agricultural areas of the basin) may be affecting the immunocompetence and/or reproduction of some bird species. DDT residues in Salton Sea sediment (from historical use) and infrequent discharges of agricultural chemicals to irrigation drains leading to the Sea may also contribute to the overall stress on the Salton Sea ecosystem.

## Background

Draft legislation in Congress provides funding for the scientific research necessary to make an informed decision on the best mechanism for remediating the problems of the Salton Sea. The legislation also establishes two multiagency committees to oversee Salton Sea research. The Research Management Committee (RMC) is composed of representatives for the Secretary of the Interior, the Governor of California, the President of the Salton Sea Authority, and the Chairman of the Torrez Martinez Indian tribe. Reporting to the RMC is the Science Subcommittee (SS) composed of technical representatives from all of the above agencies plus representatives from federal and state resource agencies.

Acting under authority of the Secretary, the Department of the Interior, in concert with the State of California and other stakeholder agencies, has initiated a National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) process and scientific research activities to guide that process in the determination of an appropriate remediation strategy. The Secretary has assembled the committees described above and has designated the Bureau of Reclamation (USBR) as the lead agency for NEPA purposes. The Salton Sea Authority (SSA) is the lead agency for CEQA. The SSA is a joint powers agency chartered by the State of California and is comprised of the counties of Imperial and Riverside, the Imperial Irrigation District, and the Coachella Valley Water District.

This RFP has been prepared by the SS as one of several RFPs being issued to obtain required scientific information. The proposed legislation requires that selection of a remediation alternative and environmental permitting be complete within 18 months of enactment of the legislation.

## Description of Needs

The NEPA/CEQA processes address environmental impacts associated with major federal and state actions that may alter the environment. There is surprisingly little recent biological research on the Salton Sea. Much of our knowledge of the Sea's ecology is dependent upon research dating back to 1961. This predates the introduction of tilapia, arguably the dominant fish species in the Salton Sea. Since 1961, there has been additional work on salinity tolerances of the sportfish species, productivity of the sportfishery (creel surveys), and selenium concentrations in water, sediment, and biota. Many aspects of the Salton Sea's ecology however, remain largely unknown.

This RFP is intended to elicit proposals to address specific aspects of this problem. The intent is to rapidly acquire a baseline description of environmental conditions in and around the Salton Sea. The information being sought is required as part of the environmental assessments being conducted. This baseline will be used as both a jumping off point for further studies and as a point against which to measure changes after initiation of a remediation program. Data gathering is expected to be complete within one year of contract award and final reports within three months of final data collection.

Because of the extremely short timeline all contractors will be required to submit data to the SS as it is collected. The SS reserves the right to redistribute data to other contractors for use in their studies before final reports are prepared by contractors originating the data. Contractors may also be required to coordinate sampling dates and furnish GPS coordinates for sampling sites.

Project awards will vary with the scope of the proposal (number of areas of study included). A maximum of \$500,000 to \$1,000,000 is anticipated for all areas of study combined.

### **Areas of Study**

The SS has identified the following areas as foci of study. The SS recognizes that delineation of some of these areas is arbitrary and will consider alternative organizations of study.

#### Plankton Biology & Physical Limnology

A comprehensive description of the Salton Sea's phytoplankton and zooplankton communities is required. This includes taxonomic identification, description of seasonal abundance cycles, and evaluation of trophic relationships. Analyses of Salton Sea water for algal toxins may also be appropriate. In addition to periodic sampling, special collecting trips may be required in response to unusual physical (e.g. low oxygen or high sulfide) or biotic (wildlife mortality) events.

This area of study also encompasses collection of physical information on the Salton Sea water column including data on temperature, salinity, and oxygen.

#### Benthos

A comprehensive description of the Salton Sea's benthic community is required. This includes taxonomic delineation, description of seasonal abundance cycles, and evaluation of trophic relationships among both benthic invertebrates and algae. In addition to periodic sampling, special collecting trips may be required in response to unusual physical (e.g. low oxygen or high sulfide) or biotic (wildlife mortality) events. This area of study may also include evaluation of benthic invertebrate species as potential candidates for introduction into the Sea.

#### Nutrient Cycling

A clear understanding of nutrient cycling within the Salton Sea is required. Specifically, the amounts and forms of nutrients contained in inflows to the Sea, as well as their distribution within the Sea's water column and sediment need elucidation. Experiments to estimate nutrient exchange between the Sea's water column and sediment may also be appropriate.

#### Fish Community

A comprehensive description of the Salton Sea's fish community is required. This may include evaluation of the state of the fishery (e.g. condition factors), estimation of recruitment success (e.g. length-frequency studies, sex ratios), and determination of trophic relationships (stomach contents analysis). Studies on seasonal and diel movements of orangemouth corvina, gulf croaker, and sargo utilizing

hydroacoustic techniques may also be necessary to determine these species usage patterns of the Sea, particularly spawning habitat. This area of study may also include evaluation of fish species as potential candidates for introduction into the Sea.

#### Avian Community

A full account of bird use of the Salton Sea is required. Since bird use varies so widely during the year, this study will require frequent censuses at multiple sites around the Sea.

*Yuma clapper rail*  
Vegetation Mapping

A detailed vegetation map of the Salton Sea shoreline is required to determine the extent and distribution of wetlands around the Sea. Habitat delineation must be based on published standards. The resolution of the resulting map must be adequate to identify habitat components of sensitive species. An appropriate level of ground-truthing must also be included in this study.

#### Contaminants

A comprehensive understanding of toxic chemicals and their distribution within the Salton Sea is required. This area of study includes source studies and studies of the distribution of contaminants in all portions of the Salton Sea ecosystem: water, sediment, and biota. Contaminants of interest include, but are not limited to: trace elements, particularly selenium; pesticides, herbicides, and their residues; and other organic chemicals including potential endocrine disruptors. Experiments to estimate rates of selenium volatilization may also be appropriate.

#### Wildlife Mortality

A thorough investigation of potential causes of wildlife mortality events is required. A comprehensive evaluation of Salton Sea microbiology may be appropriate. This study may be driven largely by the occurrence of wildlife mortality events. Separate proposals concerning bird and fish pathology may be submitted.

#### Human Health

Potential human health risks based on current Salton Sea conditions require evaluation. This includes microbiological risks from body contact activities and contaminant risks from human consumption of wildlife (fish and birds) from the Salton Sea. Epidemiological studies of the local human population may be appropriate.

#### Air Quality

Baseline measurements of air quality parameters, particularly suspended particle concentrations are required. Investigations of the relationship between exposed sediment and suspended particle composition are of special interest.

#### Cultural

no submissions

Land ownership

Water quality

Geology

Sediments

### **Submission of Proposals**

Three paper copies of each proposal and one electronic version on 3.25" IBM-formatted diskette (Wordperfect 6.1 or earlier or Microsoft Word for Windows 6.0 or earlier) should be submitted by mail postmarked no later than 35 days following the issuance date of this RFP to:

Dr. Milton Friend, Chair  
Salton Sea Science Subcommittee  
U.S. Geological Survey  
8505 Research Way  
Middleton, WI 53562-3581  
phone: (608) 821-3854  
fax: (608) 821-3817  
email: [jfelder@usgs.gov](mailto:jfelder@usgs.gov)

The required proposal format is provided at attachment A to this RFP.

Any requests for clarification of the RFP should be addressed to the SS chair by email. Answers to any clarification questions will be distributed to the questioner and all other proposal submitters by email.

Proposals may address any or all of the above areas of study in any combination. Proposals should clearly identify a separate cost for each proposed area of study.

### **Evaluation Process**

The SS will perform a initial screening of each proposal for completeness and relevance, and a first level science review to determine that the proposal addresses primary needs and is likely to provide useful information for the EIS/EIR process. Suitable proposals will then be reviewed in depth by a review committee at least half of whose members will be outside (non-SS member) reviewers. The results of the in-depth reviews will then be considered by the SS and funding recommendations made to the RMC.

The SS reserves the right to recommend to the RMC approval of portions of proposals by individual areas of study. Final decisions on science research funding will be made by the RMC.