

**NATIONAL CENTER FOR ENVIRONMENTAL RESEARCH****Office of Research and Development
U.S. Environmental Protection Agency****Science to Achieve Results (STAR) Program**

A Strategic Plan for The University of Redlands' Salton Sea Database Program

A Bi-national, Bioregional Decision Support Initiative for the Salton Sea

I. INTRODUCTION

Comprising about 375 square miles in area, the Salton Sea is California's largest lake. It provides valuable habitat for more than a million waterfowl and other birds along the Pacific flyway, as well as recreational, hunting, fishing, and significant agricultural values. However, during the past 10 years the Salton Sea has experienced a number of massive fish and bird die-offs as a result of a suite of pathogenic and other contaminant problems. Situated in a closed basin at approximately 227 feet below sea level and separated by one hundred miles of alluvial deposits of Colorado River from the Gulf of California, the salinity of the Salton Sea has increased steadily since its original historic inundation in 1905 to the point where it is now one fourth saltier than the ocean; and at current rates of salt loading of 4 million tons of salts per year, the Salton Sea will be unsuitable for fish and other wildlife in 15 years. The Salton Sea is facing ecological collapse.

To date, many local, State and Federal resource management agencies have collected data pertinent to their particular purview with respect to the Salton Sea (information concerning fish and wildlife by the U.S. Fish and Wildlife Service and the California Department of Fish and Game, or hydrology data compiled by the U.S. Bureau of Reclamation and the area water agencies). In order to facilitate the environmental evaluations of the proposed engineering alternatives to restore the Salton Sea, there is an urgent need to consolidate these data in a commonly accessible database, and serve this data back out to decision-makers, stakeholders, resource agencies and the concerned public to promote an informed decision-making process.

The University of Redlands has established the Salton Sea Database Program (SSDP) under the auspices of a \$2 million congressional appropriation administered by the U.S. Environmental Protection Agency (EPA). The SSDP will collect, review and analyze bibliographic and scientific data on the Salton Sea; and serve these data to the decision-makers, stakeholders, and members of the public concerned with restoration of the Salton Sea.

II. PROGRAM OVERVIEW

A. Center for Environmental Manaaement

The University of Redlands has established the Center for Environmental Management (CEM) to provide students with practical experience dealing with environmental management problems. Using state-of-the-technology geographic information systems (GIS), global position systems (GPS), databases and image analysis programs as tools for environmental problem-solving, together with courses focused on environmental impact assessment, law and resource management policies, CEM projects provide students with opportunities to apply these technologies and studies in real-world projects and problem-solving situations. CEM projects may include analyses of small, site-specific development projects or complex, large-scale regional resource management issues. Currently, the CEM is working on two large-scale projects: the Salton Sea Database Program, as discussed herein, and the California Historical Resources Information System (CHRIS) program --- establishing a statewide GIS-based "hub" for cultural and historical resources in California. For an online overview of the CEM projects and staff, one can view the CEM website at: <http://cem.uor.edu>.

B. Salton Sea Database Program

The Salton Sea Database Program (SSDP) was established to facilitate evaluations of proposed restoration projects for the Salton Sea. The primary objectives of the SSDP are to:

- collect existing information pertinent to the environmental review of Salton Sea restoration project alternatives;
- evaluate the data in accordance to established Federal and State quality assurance/quality control protocols;
- geographically reference the data to a digital base map and enter the data into a GIS;
- perform analyses of the data using GIS techniques and softwares;
- and serve the data to concerned parties via the Internet and electronic information transfer.

C. Authorities

The following agencies and interagency organizations have been given decision-making authorities with regard to evaluating restoration project alternatives for the Salton Sea. The Salton Sea Authority (SSA) is a Joint Powers agency established to oversee resource management decisions regarding the Salton Sea. The SSA is comprised of representatives of the Coachella Valley Water District, the Imperial Irrigation District, Riverside and Imperial Counties. The U.S. Bureau of Reclamation (Reclamation) is the Federal lead agency and the SSA is the State lead agency with regard to environmental evaluations of the proposed engineering alternatives to restore the Salton Sea (the Project). The SSA is presently negotiating the terms and conditions of approval of a \$5 million congressional grant appropriation to undertake environmental impact studies and feasibility studies of Project alternatives.

The Secretary of the Department of Interior has established the Salton Sea Research Management Committee (Management Committee) to manage these investigations and coordinate the environmental review process of the Project alternatives. The Management Committee is comprised of an appointee each of the Secretary of Interior, the Governor of California, the Executive Director of the SSA, the Chairman of the Torres-Martinez Desert Cahuilla Tribal Government, and the Director of the California Water Resources Center.

An interagency "Science Subcommittee" (Subcommittee) has been established to provide technical review and make recommendations to the Management Committee.

The Subcommittee is comprised of scientists and technical experts representing 16 Federal, State and local agencies and universities. The Subcommittee will report to the Management Committee, providing technical review of the data and environmental evaluations regarding the Project alternatives.

The following table lists the agencies and institutions that are represented in the Management Committee and Subcommittee.

TABLE: ORGANIZATION AND MEMBERSHIP OF SALTON SEA RESTORATION PROJECT COMMITTEES

Salton Sea Authority Members

Coachella Valley Water District
Imperial Irrigation District
Riverside County
Imperial County

Research Manaagement Committee

U.S. Department of the Interior
State of California, Governor's Office Appointee
Salton Sea Authority
Torres-Martinez Desert Cahuilla Tribal Government
California Water Resources Center

Science Subcommittee

Chairman: Dr. Milt Friend, Director, National Wildlife Center, U.S.G.S.
U.S. Army Corps of Engineers - Mr. James Adams
U.S. Bureau of Reclamation - Mr. Bill Steele
U.S. Bureau of Land Management - Mr. Henry Bisson
U.S. Environmental Protection Agency - Dr. Lee Mulkey
U.S. Fish and Wildlife Services - Ms. Sherry Barrett
U.S. Geological Survey - Dr. John Elder
California Department of Fish and Game - Dr. Glenn Black
California Department of Water Resources - Mr. Charles Keene
San Diego State University - Dr. Tim Huschen
University of California at Riverside, Dr. Phil Roberts
University of Redlands, Dr. Tim Krantz
Imperial Irrigation District, Mr. Michel Remington
Coachella Valley Water District, Mr. Richard Thiery
Imperial County - Ms. Roberta Burns
Riverside County - Mr. Don Park
Salton Sea Authority - Mr. Paul Cunningham

III. SALTON SEA DATABASE PROGRAM STRATEGIC PLAN

In order to meet the expedited schedule for environmental evaluations of Salton Sea restoration project alternatives, the SSDP has established a state-of-the-technology GIS laboratory and server, staffed by a core of five fully-dedicated personnel.

A. Personnel

The CEM Director, Dr. Timothy Krantz, is responsible for managing and operating the research Center, and is the EPA Project Officer's principal point of contact with the Center. Dr. Krantz is assisted by Ms. Charlotte Johnson, SSDP Administrative Assistant, and Mr. Doug Mende, GIS Technical Manager for the project.

IV. SCIENCE ADVISORY COMMITTEE

The Salton Sea Science Subcommittee, as established by the Secretary of Interior and in legislation pending before the Congress (the Salton Sea Restoration Act, H.R. 3267 and S.B. 1716), serves as the technical review committee for evaluation of Project alternatives. The interagency composition and broad range of technical expertise of the members of the Subcommittee enable it provide technical review of the full spectrum of scientific data in order to render sound recommendations to the Management Committee. In this way the Subcommittee functions in a scientific advisory role to the Management Committee -- the decision-making body that will make recommendations to the Congress. The SSDP serves as the information clearinghouse for these two committees, as well as serving information to stakeholders, non-government organizations and the general public during the environmental review process.

The Management Committee and Subcommittee are committed to high quality science being the foundation for the management decisions associated with the selection of preferred approaches for restoration of the Salton Sea. The Subcommittee has established a Data Review Panel (DRP) to screen existing data and provide qualitative assessments of the data. In this way, the DRP functions as the Science Advisory Committee (SAC) for the SSDP.

The DRP is comprised of five non-CEM members, plus Dr. Krantz and Mr. Mende on behalf of the SSDP. Dr. Barry Gump, a chemistry professor at California State University at Fresno and on contract to the California Department of Water Resources as their Quality Assurance (QA) officer, has been retained as QA Officer for the Salton Sea Authority and will chair the SSDP-SAC. The other members of the DRP are identified in the following QA Diagram. The EPA Project Officer is an active, non-voting member of the SAC. Members of the Subcommittee also provide independent review and may serve in an advisory capacity to the SSDP with respect to their individual areas of expertise, as detailed in the following QA Plan section.

A. Meeting Protocol

The DRP will meet regularly (at least twice annually, but during early project development the DRP has met monthly since April). Meetings begin in an open session with a presentation by the Center Director on SSDP status and project reports.

The chairman of the DRP may convene an executive session, in which case the members of the CEM will leave the group and the non-CEM members may discuss matters concerning the SSDP independently. The executive session may discuss the issues at hand, develop recommendations and report these back to the Center Director.

V. QUALITY ASSURANCE/QUALITY CONTROL PLAN

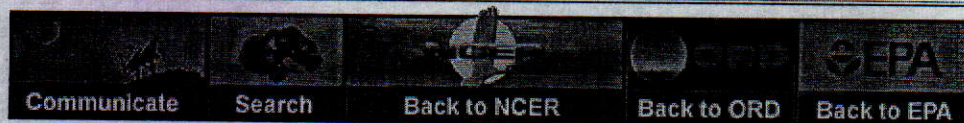
The Management Committee, Subcommittee and SSDP are concerned with maintaining data quality standards in two ways: 1) to ensure that existing data sets that are entered into the SSDP are reliable and of high quality, and 2) that new data are collected according to acceptable standards and protocols. It should be noted that the SSDP is primarily concerned with compiling existing information from other agencies, and as a general rule is not collecting raw data in the field.

The Federal Geographic Data Committee (FGDC) has developed standards for a wide variety of data. Information in the SSDP will include the wide range of scientific subjects and, thus, will have to be reviewed in accordance with different QA standards and data collection protocols, depending upon the subject matter. The SSDP will follow FGDC guidelines for establishing metadata for existing data sets, as well as provide guidelines for collection of new information.

The Quality Assurance Plan Diagram outlines the general QA procedures that have been established for the SSDP by the Subcommittee and the DRP. The DRP meets regularly (it has been meeting monthly for the past three months) to review data acquisitions and identify data gaps or needs. The DRP evaluates the data and develops a metadata record for each data set: by whom, when, how was the data collected? The DRP may determine that:

1. The data set is valid and should be entered into the database, along with appropriate metadata;
2. The data is flawed in some respects, but is still of value for entry into the database, with proper annotation of the nature of the deficiencies of the data set in the metadata for the SSDP, or;
3. The data is irreparably flawed and should not be entered into the database, with annotation in the metadata for the SSDP describing why the DRP has rejected this data set.

In some cases, the DRP may forward certain data sets to technical review groups within the membership of the Subcommittee for more detailed evaluations. In this case the technical reviewers may make the determinations for data entry, as noted above.



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