

Synthesis Document on Sediment and Contaminants in Salton Sea
Doyle Stephens
July 13, 1998

Characterization of trace elements and anthropogenic organic compounds in bottom sediment and in suspended material entering the Salton Sea and their potential as contaminants to biota.

Description

Implementation of several alternatives or actions to restore the Salton Sea may expose and mobilize contaminants present in bottom sediment of Sea and suspended sediment discharged to the Sea contains various elements and compounds sorbed onto particulates. Information will be provided on concentrations of trace elements and anthropogenic organic compounds in bottom sediment of the Salton Sea and adsorbed to suspended sediment in inflowing streams. This should include information on the ionic form present, availability to the biota through the food chain as well as direct exposure, and potential for adverse effects on biota or humans. The summary should include preliminary calculation of loads of suspended sediment and associated loads of adsorbed contaminants, primarily from the Alamo and New Rivers. Particular attention should be directed to forms of selenium, DDT and its metabolites (primarily DDD and DDE), toxaphene, and hexachlorobenzene. The scope of this document should extend back to 1980.

Sufficient information also should be provided to assess the potential effects of wind-blown lake sediment particulates on human and animal health.

+++++

Note: There appears to be only a few reports specific to sediment and contaminants associated with sediment in Salton Sea. The following list gives related subjects that would be helpful to the evaluation of data for the Salton Sea. I have considerable collection of papers dealing with mobilization and toxicity of selenium from sediment, and some info on chlorinated hydrocarbons.

Your ideas are welcome..

Related Subject Areas

- Sorption/desorption of chlorinated HC (DDT isomers, toxaphene, hcb) to/from sediment.
- Mobilization of selenium from bottom sediment.
- Availability of selenium to biota.
- Availability of chlorinated hydrocarbons to biota.

Outline

- I. Introduction- Role of suspended and bed sediments in transport and release of trace elements and organic compounds (primarily chlorinated hydrocarbons).
- II. Physical and chemical factors and importance to adsorbed substances
 - A. Relation of grain size of sediment to sorption processes in suspended sediment and bottom sediment of Salton Sea.

- B. Relation of surface area of particles of suspended and bottom sediment in Salton Sea to sorption of trace elements and organic compounds.
 - C. Occurrence of oxides, organic matter, and clays in inflowing water sources and bed sediment of the Salton Sea.
 - D. Occurrence of toxic levels of trace elements and organic compounds (primarily chlorinated hydrocarbons) in inflowing water sources and bottom sediment of the Salton Sea.
 - E. Concentration of organic carbon in bottom sediment of Salton Sea and soil sorption coefficients (K_{oc}) for contaminants of interest in the Sea.
- III. Desorption of trace elements and organic compounds from sediment associated with the Salton Sea.
- A. Relation to pH, redox conditions, dissolved oxygen, and temperature
 - B. Applicability of predictive desorption models to the Salton Sea
- IV. Bioavailability of toxic substances sorbed to sediments of the Salton Sea.
- A. Selective chemical extraction tests applied to sediment from Salton Sea
 - B. Existing bioassay tests specific or related to Salton Sea
 - C. Studies relating bioavailability to toxicity.
- V. Composition of near-shore sediment and potential for wind-blown transport and associated health problems in humans.