

## Category II - Aquatic Ecosystems

### Quantifying Sediment Resuspension Linkages to Nutrient Enrichment in the Existing and Future Salton Sea

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#### EXECUTIVE SUMMARY

The Salton Sea is a terminal lake located in the southeastern desert of California, and is the largest “lake” in California. It occupies the northern part of the Salton Trough that includes the Coachella and Imperial Valleys of California and the Mexicali Valley of Mexico. Its main source of water is irrigation return water from the Coachella and Imperial Valleys use of Colorado River water. Under the 2003 Colorado River Quantification Settlement Agreement and Salton Sea ecosystem restoration legislation, inflow to the Salton Sea is to be reduced by 20%, while at the same time part of the revenues raised by this historic transfer are to be used for the ecological restoration of the Salton Sea.

Currently the Salton Sea is a hyper-eutrophic water body characterized by low oxygen concentrations, massive fish kills, noxious odors and possibly related bird kills. Recent water quality modeling conducted by the University of California, Davis, indicated that eutrophication in the Sea is driven primarily by nutrients associated with sediment resuspension and suggests that inflow control alone will not produce the desired state. Sediment resuspension is a function of windspeed, water depth, lake fetch (or length) and the density (thermal) stratification. As the Sea recedes (due to the 20% inflow reduction) or if, as appears possible, a massive construction project is undertaken to change the physical construction of the Sea, the extent and the effects of sediment resuspension will change.

This proposal seeks to undertake an eight-month measurement program in the Salton Sea to directly measure sediment resuspension using an array of optical backscatter sensors. The data provided by these instruments, in conjunction with existing UC Davis temperature instruments in the Sea and the CIMIS meteorological network, will provide sufficient data to develop a new, process-based resuspension algorithm, and fully calibrate and validate it as part of the water quality model, DLM-WQ. The model can then be used to more fully explore the potential for ecological restoration of the Salton Sea, either under its present geometrical configuration or possible future configurations. The model, which is in the public domain, will also be applicable to many other lakes and reservoirs, where sediment resuspension or the nutrients and contaminants that are associated with the sediments, are an issue.