

# Hydrologic Technical Workgroup Meeting March 26, 2008

## *Key Questions*

### Hydrology (Inflows/Outflows/Storage)

1. How refined are our understandings of the system plumbing and water budgets?
2. What are the current quantity, quality, and trends of inflows to the Salton Sea?
  - a. What are the relative contributions of various sources of inflow? (New River, Alamo River, Direct Drains, Whitewater River, San Felipe Creek, Salt Creek, groundwater, precipitation)
3. What are the appropriate levels of precision and accuracy for quantity, quality, and trend data?
4. What are the spatial and temporal patterns in the quality and quantity of inflows to the Salton Sea?
5. What current and future activities in the watershed, including imports and exports, could affect the quality and quantity of inflows to the Salton Sea?
  - a. Mexico policy decisions (e.g., phosphate, inflow availability)
  - b. Cropping patterns
  - c. Tile/Tailwater contributions
  - d. Colorado River management
  - e. Urbanization
  - f. Water quality regulations (e.g., TMDL)

6. What are the effects of inflows on sea elevations and associated exposure of playa?
  - a. How do we reconcile differences between the USGS and IID elevations datums? What elevation datum will be the program standard? (*coordinate with geophysical workgroup*)
7. What data are necessary to characterize climatological trends and hydrologic processes?
  - a. What meteorological and climatological data are necessary in and around the sea? (wind speed, evaporation, temperature) (*coordinate with Air Quality Workgroup*)
8. What is the extent of the study watershed for groundwater (e.g. elevation) and surface water?
9. What is the relationship of the hydrologic budget to the salinity of the Salton Sea?

## Water Quality and Sediment Quality

1. What are the key water and sediment quality parameters necessary to characterize baseline and future habitat quality and function at the Salton Sea?  
(*link to Biology and Air Quality Workgroup*)
  - a. *Salinity, selenium (speciation), temperature, DO, turbidity, pH nutrients, ammonia, Redox, H<sub>2</sub>S, sulfur (speciation), total organic carbon, grain size, chlorophyll, dynamics (stratification/destratification), pesticides, arsenic*
  - b. What are the current and future trends of sediment loading, quality, and deposition?

- c. How are adsorbed constituents affected when sediment reaches the Salton Sea?
2. What are the key water quality and sediment parameters necessary to assess baseline and future ecological risk at the Salton Sea?
  - a. See above
3. What are the key water quality and sediment data necessary to characterize eutrophic conditions of the Salton Sea?
  - a. Nutrient inflow
  - b. *temperature, DO, turbidity, pH, nutrients, ammonia, Redox, H<sub>2</sub>S, sulfur (speciation), total organic carbon, grain size, chlorophyll, dynamics (stratification/ de-stratification), Secchi depth*
  - c. aerial/satellite observations (episodic, algal and gypsum blooms, fish die-offs)
4. How are important water quality parameters cycled in the Salton Sea?
  - a. Carbon cycle
  - b. Selenium cycle
  - c. Sulfur cycle
  - d. Nutrient cycle (P, N) (fish as a P sink)
  - e. Circulation, suspension, stratification/destratification, decomposition, sinks, volatilization,
5. Does salinity stratification occur?
  - a. What is the importance of salinity stratification in selenium cycling?

- b. What is the extent of the freshwater lens, if any?  
Duration?
  - c. Would salinity stratification affect mixing zones in constructed habitats?
- 6. What are the critical changes over time within the watershed affecting the quality of inflows?
- 7. What processes are important to characterize the transport of water and water quality parameters?
  - a. Deposition
- 8. Will the Sea develop carbon dioxide sinks that could be released during lake turnover, posing a human health risk?

## Groundwater

- 1. What is the relationship between groundwater movement and the elevation of the Salton Sea, including potential locations of constructed habitats?
  - a. What is the extent of the basin of influence affecting/affected by the Salton Sea?
  - b. What is the transmissivity of the aquifer?
  - c. What is the estimated hydraulic conductivity of the seabed?
- 2. What are the physical and hydraulic conditions within the groundwater system(s)? (hydrostratigraphy, physical, chemical, head conditions, water quality, geologic structure)
- 3. How is Sea water quality affected by groundwater levels and the elevation of the Salton Sea?

4. What are the trends in groundwater conditions affecting the Salton Sea over time?
5. How can the interaction of groundwater with the sea, atmospheric conditions, and land surface be characterized?
  - a. As the Sea recedes, when and where will seeps develop? If yes, will they mitigate some air quality concerns and/or will there be potential to develop them as a water supply for constructed habitats?
  - b. What is the relationship between groundwater levels and formation of salts at the surface of exposed playa?
6. What is the potential risk that dewatering will contribute to subsidence?
7. What are the groundwater sources, sinks, and changes in storage?
8. What are the localized effects of other constructed wetlands (e.g. Imperial Valley wetlands, Torres Martinez, other proposed projects) on groundwater?
9. How do the geothermal zones influence groundwater conditions? (*add to hydrology too*)
10. What are the groundwater quality parameters of interest?
  - a. Perchlorate?
  - b. Trace elements

## Hydrodynamics

1. What creates the stratification//destratification dynamics?

- a. Thermal stratification
  - b. Circulation
  - c. Mixing
  - d. Pycnocline (spatial extent, duration, biological productivity)
2. What wave height and interval data are necessary, spatially and temporally? (wind wave re-suspension, circulation)