

Crisis at the Salton Sea: The vital role of science

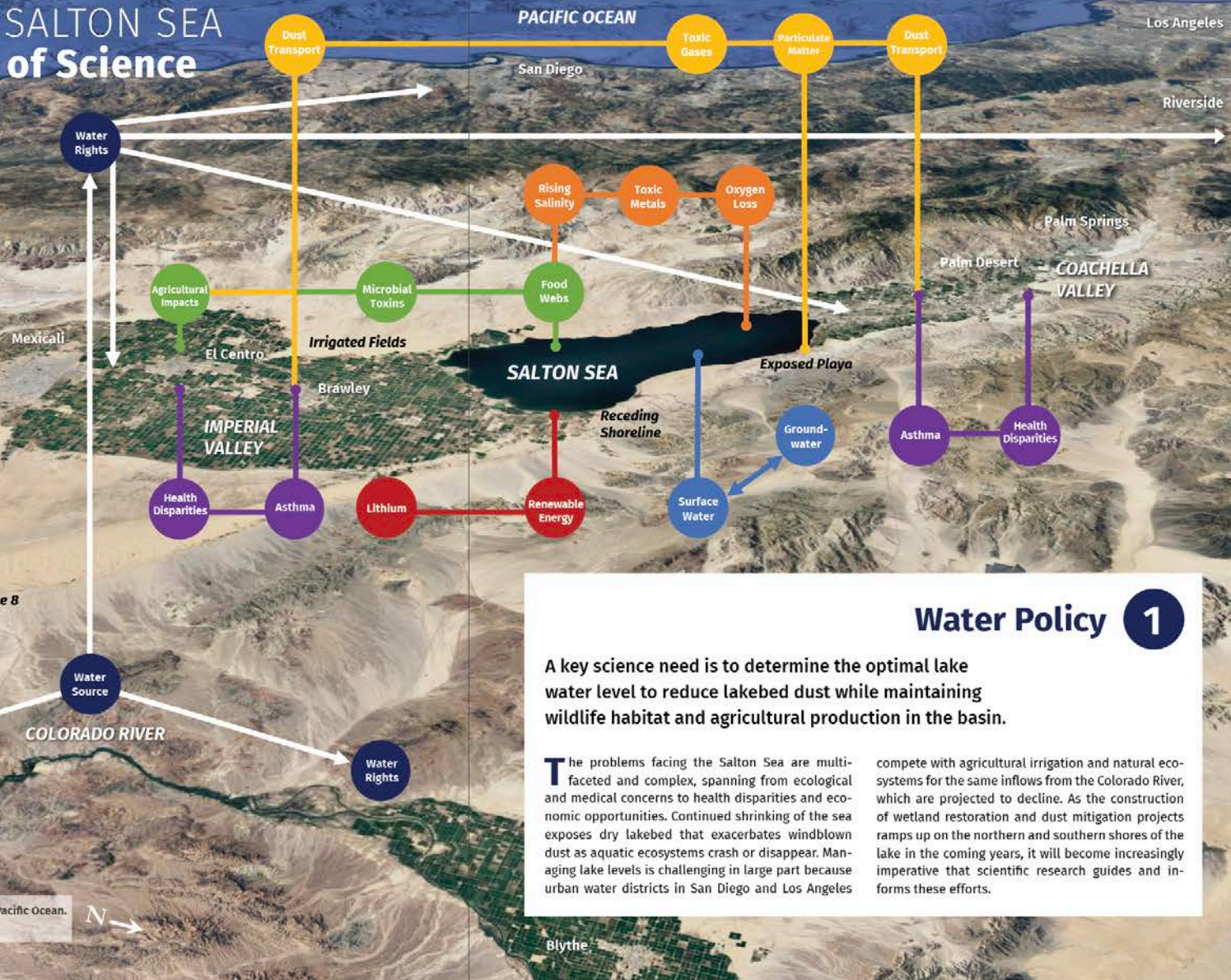
Salton Sea Task Force, EDGE Institute, UC
Riverside

Salton Sea Task Force

- Health Disparities
- Dust Generation and Transport
- Water Issues and Hydrology
- Ecosystem Collapse
- Biogeochemistry of the Sea
- Minerals (e.g. Lithium) and Energy



- 1 WATER POLICY
- 2 WATERSHED HYDROLOGY
- 3 WATER CHEMISTRY
- 4 AIR QUALITY
- 5 ECOLOGY
- 6 HUMAN HEALTH
- 7 GEOTHERMAL RESOURCES



Water Policy 1

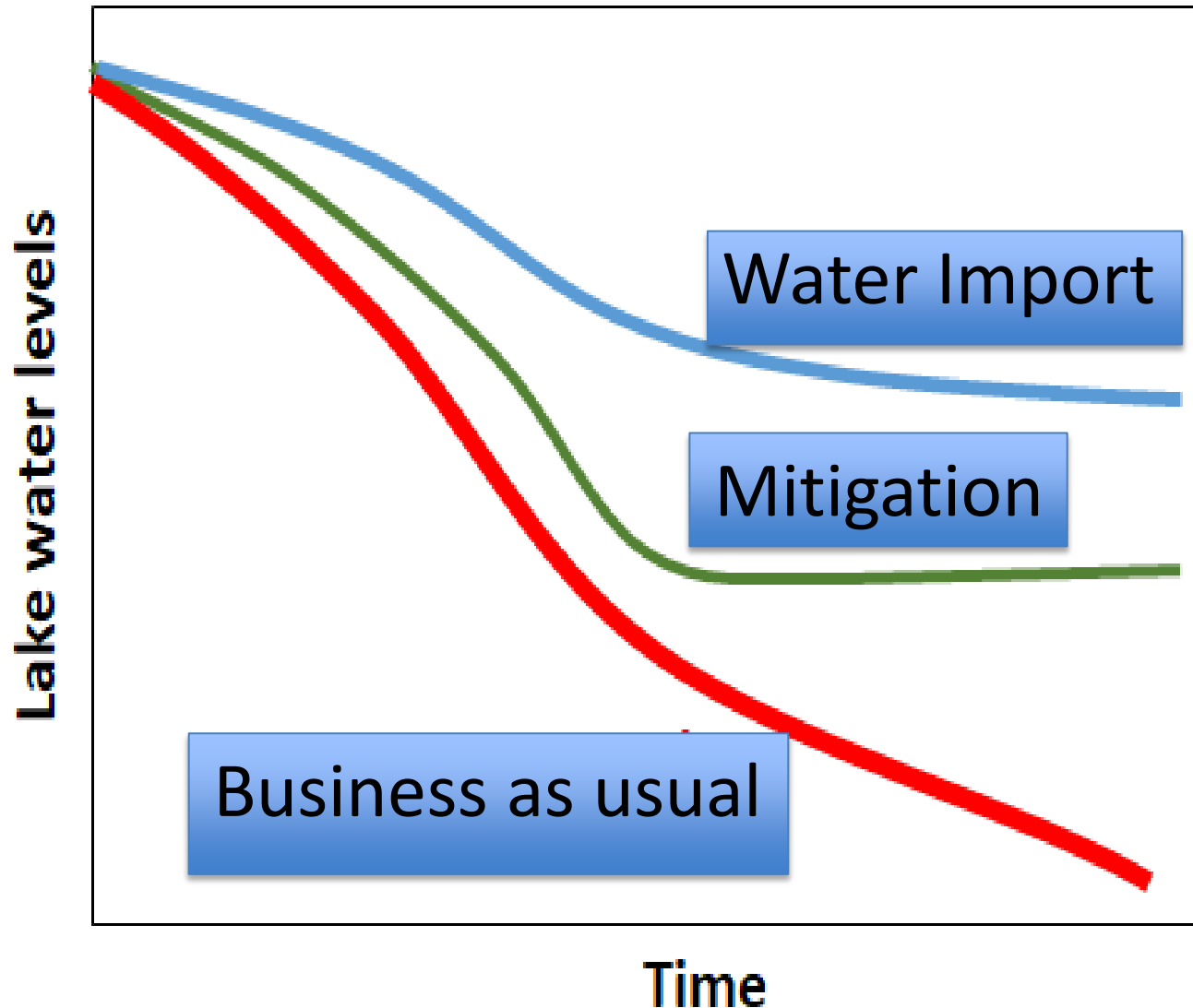
A key science need is to determine the optimal lake water level to reduce lakebed dust while maintaining wildlife habitat and agricultural production in the basin.

The problems facing the Salton Sea are multifaceted and complex, spanning from ecological and medical concerns to health disparities and economic opportunities. Continued shrinking of the sea exposes dry lakebed that exacerbates windblown dust as aquatic ecosystems crash or disappear. Managing lake levels is challenging in large part because urban water districts in San Diego and Los Angeles

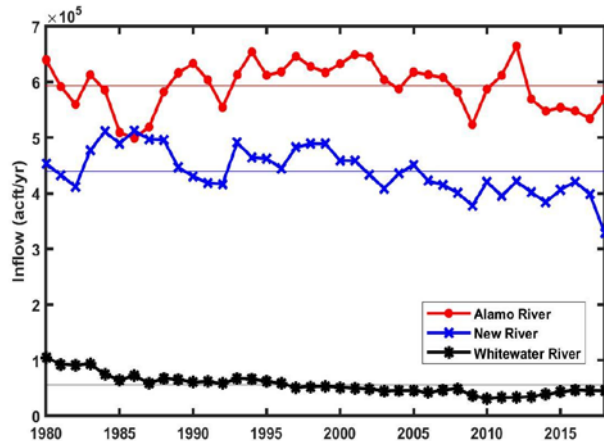
compete with agricultural irrigation and natural ecosystems for the same inflows from the Colorado River, which are projected to decline. As the construction of wetland restoration and dust mitigation projects ramps up on the northern and southern shores of the lake in the coming years, it will become increasingly imperative that scientific research guides and informs these efforts.

LOOKING WEST across the Salton Sea toward the Pacific Ocean.
Sarah Simpson; BASE MAP: Google Earth

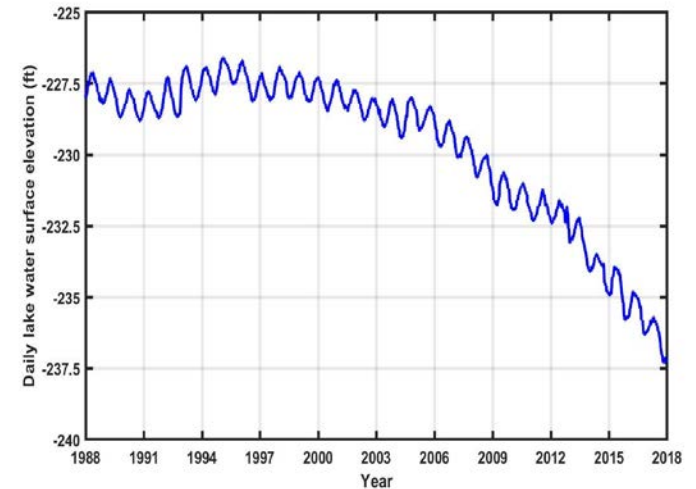
The Future of the Sea?



Saving the Sea: A Multifaceted Water Problem



Inflows to the Sea



Lake Level



Environmental Flows

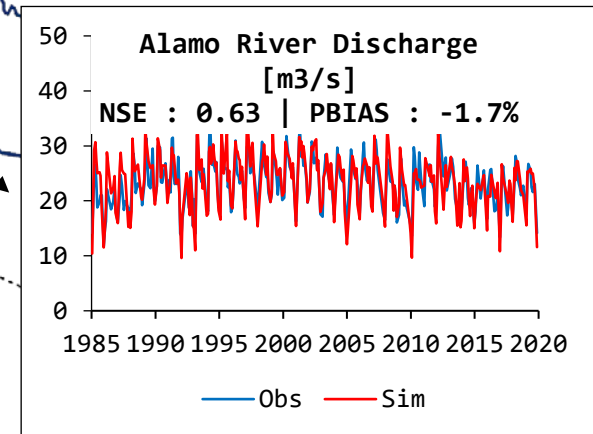
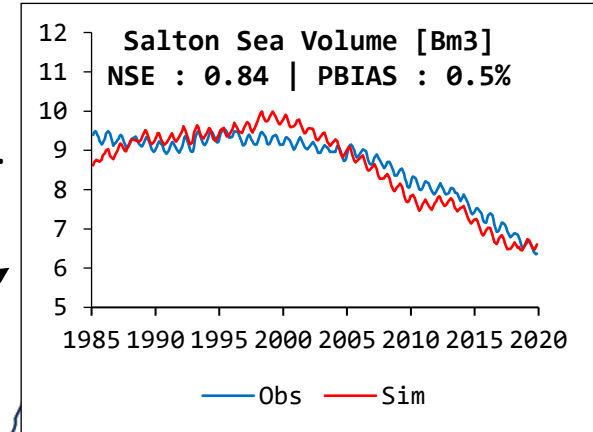
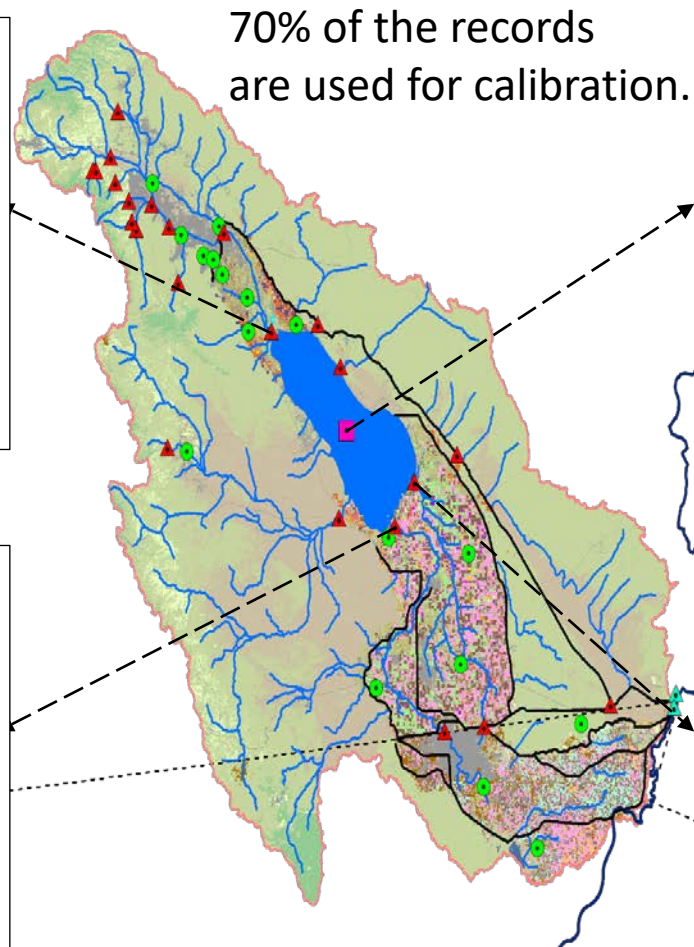
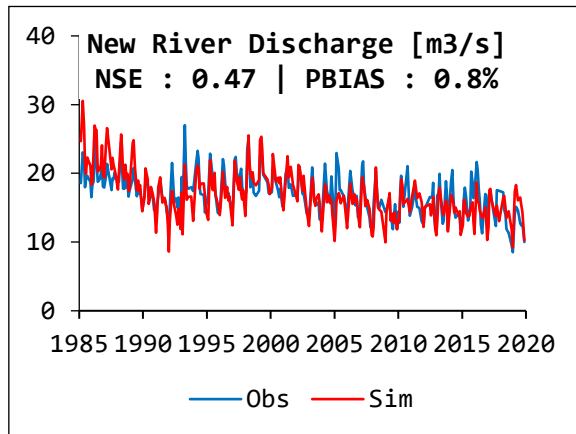
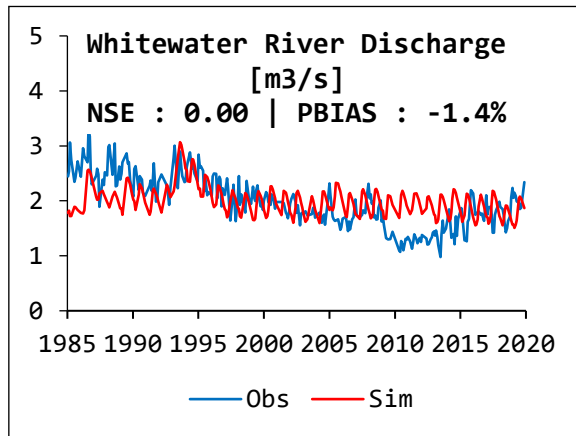


**Exposed Playa
Increasing: Why?**

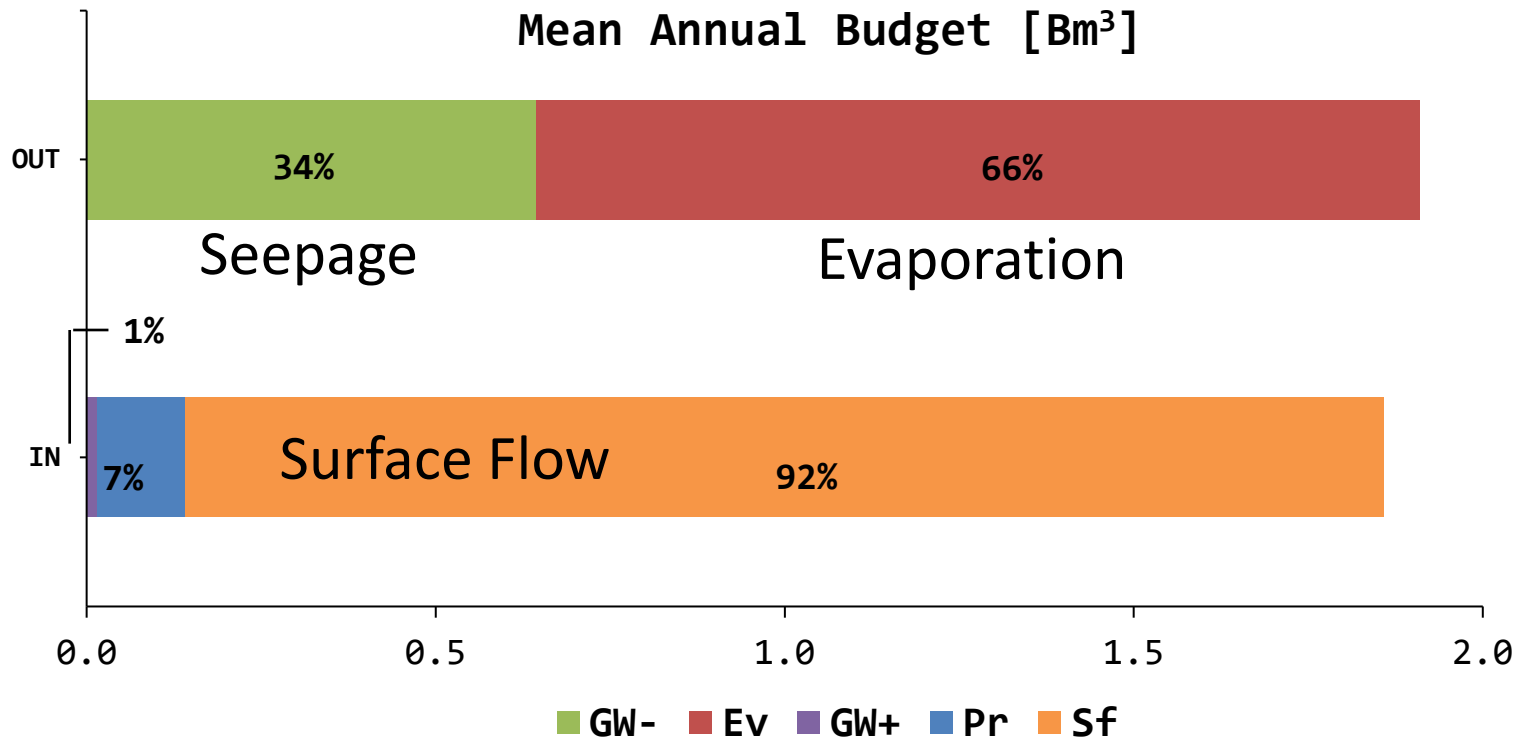


Food Production

Utilized a semi-distributed modeling approach with water management options.

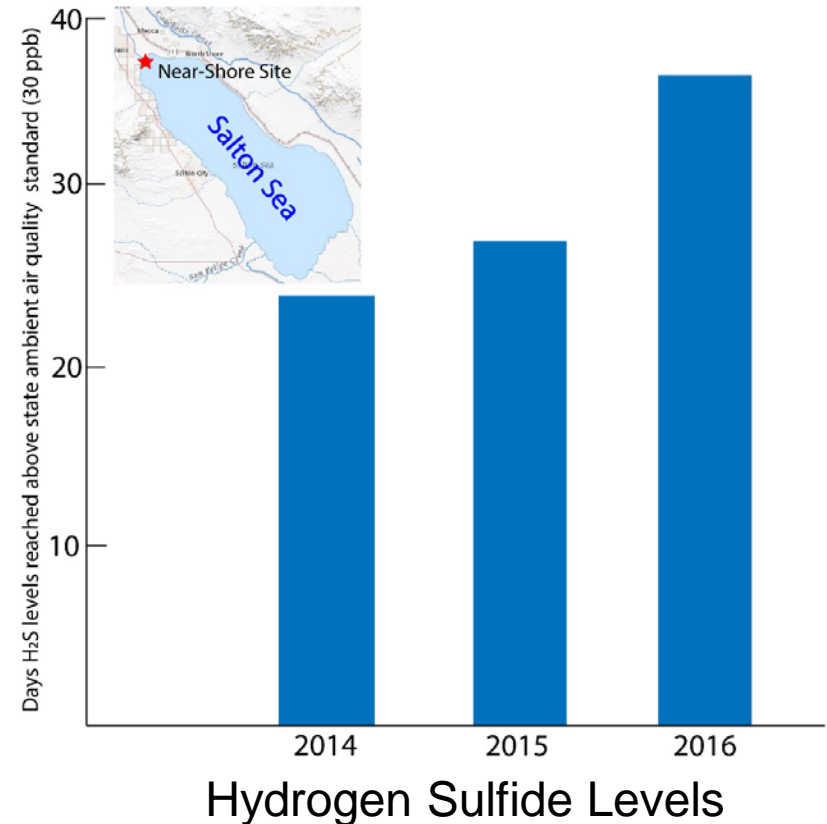


Lake water balance is mainly controlled by surface inflows and evaporation and seepage losses.



Acero Triana & Ajami. *In Preparation*

Air quality linked to chemistry of the Sea and the organisms living in it

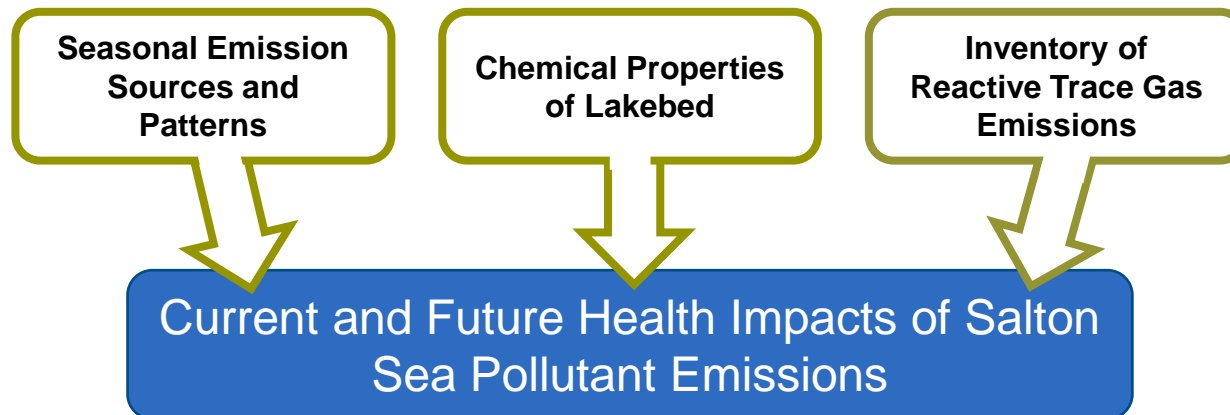


- Airborne dust at sites close to the Sea is already high even before shorelines are fully exposed.
- Dust at sites closest to the shore of the Salton Sea is associated with emissions from the lake and sea spray.

Dust storms blanket the region affecting health



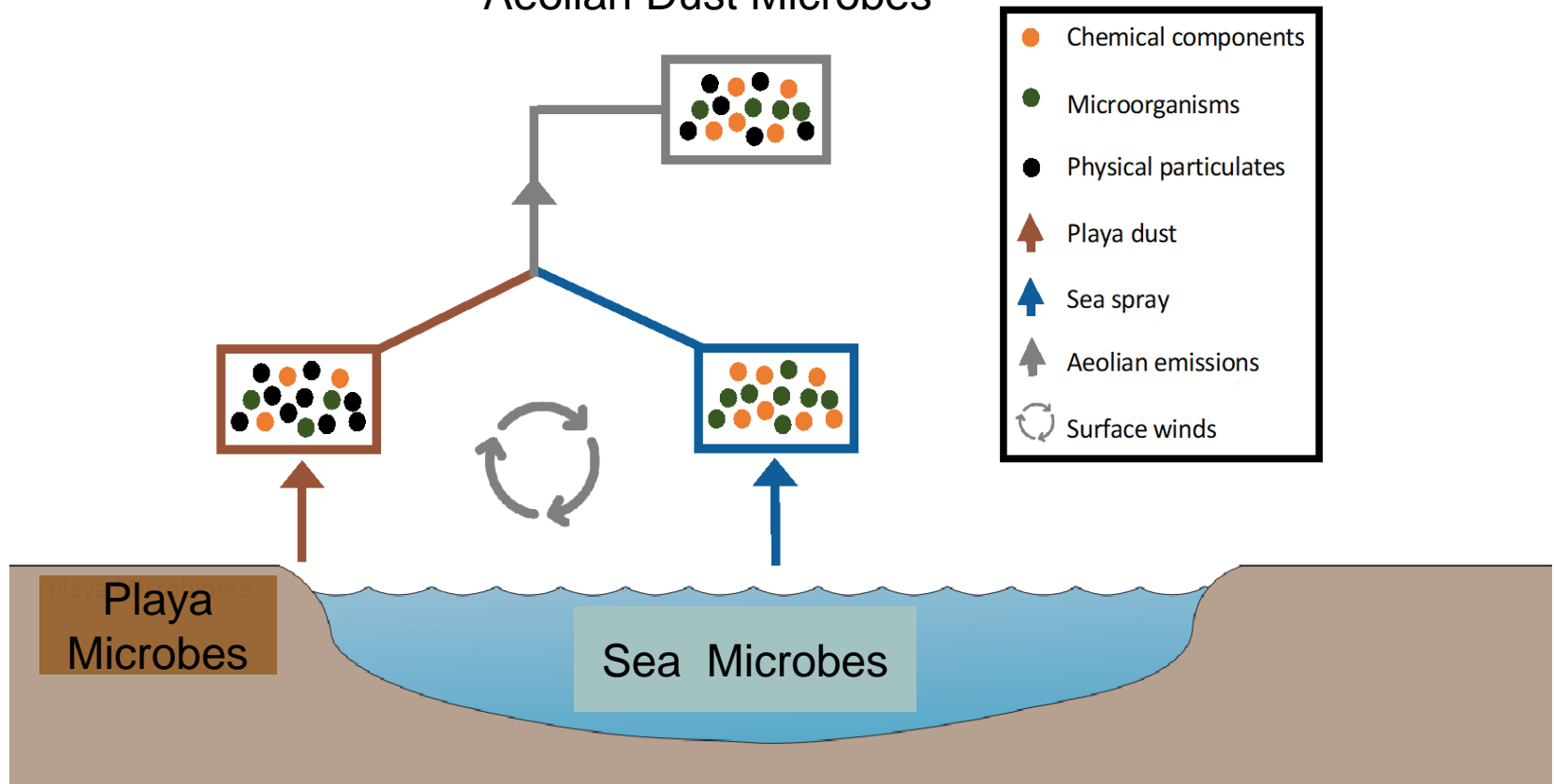
Fingerprinting of Chemicals in Airborne Dust and Playa



- Little is known about composition of inhalable dust
- Organic, inorganic, and metal contents of source regions and airborne dust are critically missing

Identifying Microbial Toxins in Salton Sea Dust

Aeolian Dust Microbes



- Microbes in the Sea, playa or dust may be producing toxins entrained in dust, and inhaled

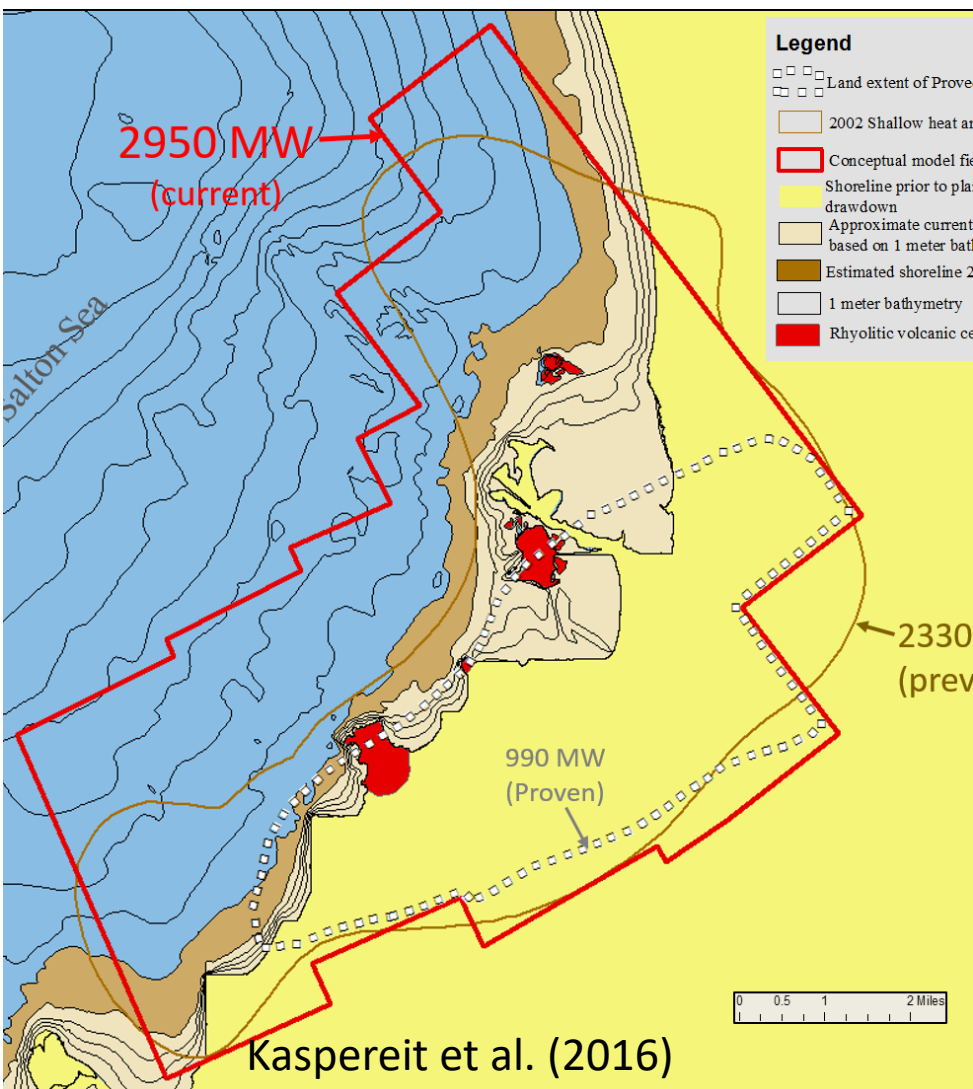
Salton Sea and Health Impacts

The major concern driving mitigation is the impact of the Salton Sea on health in the region, especially pulmonary health (asthma)

- Ongoing studies (BREATHE center) are looking at aerosol transport, ecological stress at the drying Salton Sea, and health effects of local aerosols produced at the sea
- Yet health impacts are not being assessed in the region; the benefits of the mitigation projects must be evaluated on their impact on community health, not just on dust levels



Lithium can be extracted from Salton Sea Geothermal Field



- Over 1000 Megawatts Energy generation
- 230 employees/month during construction
- 400 full time employees
- \$900M Annual Revenue
- \$20M in Imperial County Taxes

Action is required now to fully assess the present and predicted risks to Salton Sea water and air quality and health risks.

Measuring, research, and modeling are certain to play a key role in lake management and impact decisions.

These results are needed as mitigation and remediation choices are being made.