Photo courtesy Henry Detwiler

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Restoring the Salton Sea

California's largest lake, the Salton Sea, is facing it's destruction. Salton Sea provides a migratory habitat for birds, a recreational park for tourists as well as locals, and barrier keeping toxic chemicals from getting into the air. This is the not first time the Salton Sea is affected by habitat alterations. It has a history of disappearing, emerging again by way of natural occurrences, disappearing, and emerging by man made methods. Salton Sea is known to some as the accidental lake from a project malfunction leading to its formation. Once a part of the Gulf of California, it has been separated due to receding waters and drying up from heat. The Salton Sea is sandwiched between the San Andreas fault to the East with the San Jacinto fault to the West. To the North is Mojave Desert and to the South is the Sonoran Desert. Temperatures can reach up to 120 degrees in this zone but it still remains a tourist attraction. Miles to the west is the city of Palm Springs. Well below sea level, the lake now accumulates runoff from nearby rivers and streams with the majority from the Colorado River. Its salt content is 25% higher than the ocean water's. More than 100 species inhabit this bio-diverse environment 35 miles long and 15 miles wide.

Located in between two fault lines, the sea is analyzed with sonar devices for fault data. If the San Andreas fault and the San Jacinto fault were to shift at the same time, the Salton Sea would be the first to be affected. Scientists name this “The Big One” where the lake serves as a starting point for the earthquake that can stretch miles. An intact lake can possibly help us predict if or when “The Big One” might occur. At 227 feet below the sea level, the Salton Sea is a lake with its unique absent drainage into an ocean. On the Clean Water Act's Impaired Water Bodies List is the Salton Sea. With sewage water entering the lake and having no where to go, this receding lake poses environmental health risks for humans and wildlife.

According to the U.S. Geological Survey, the water's main exit is by evaporation[1] leaving a high salt water content. Not only does the salt remain[2], but the chemicals and runoff from connected streams enter the air as they dry, according to the information provided by the California Salton Sea Authority. Sediment in the lake bed contains harmful substances[3] as mentioned in an Environmental Protection Agency Newsletter. They can turn into dust or PM10[4] forming dust clouds, recorded in a statement by the acting deputy of air for the Environmental Protection Agency. PM10 is a harmful substance damaging the respiratory system. Throughout the year is the formation of algae blooms whose toxins negatively harm nearby species while also providing food for others. Currently, pollutants entering the sea include aluminum, cadmium, chromium, iron, lead, nitrate, selenium, and zinc. Agricultural drainage is one reason the Salton Sea still exists. A lake would not normally survive the 90 years Salton Sea has without nutrients and chemicals changing the water quality.

Common fish are the tilapia. Migrating birds eat these fish. “California's crown jewel of avian biodiversity” is what the lake is referred to by scientists. Salton Sea provides fish with bountiful sources of food as fish. Although there are harmful nutrients entering the sea, a food cycle exists in this

1 http://pubs.usgs.gov/fs/2007/3097/pdf/fs20073097.pdf
2 http://www.saltonsea.ca.gov/facts/fs_waterquality.htm
3 http://www.epa.gov/fishadvisories/advisories/news/newsjuly04.htm
4 http://www.epa.gov/ocir/hearings/testimony/108_2003_2004/2004_0112_mh.pdf

lake. Algae and phytoplankton are eaten by worms and zooplankton which are eaten by fish. Abundant algae blooms decompose and with the lake's increasing temperature from heat, oxygen content in the water declines[5]. Fish die due to lack of dissolved oxygen in the lake, forcing their breeding grounds to be located near shores and mouths of entering rivers. 80 to 90 percent of endangered birds in North America inhabit this lake during migration. The lake's only endangered fish is the desert pupfish considering high salt levels can impact their reproduction. A U.S. Bureau of Reclamation Chemical and Physical Limnology[6] investigation found signs of eutrophication which can be fixed by removing phosphorous.

What is currently being done to help restore the Salton Sea? A solution is cleaning one of the connecting rivers, the Whitewater River. The Torres Martinez Indian Reservation was given $1.5 million from the EPA for this project[7]. The tribe owning 12 miles of Salton Sea will attempt to restore the lake to it's fullest natural state. Surrounding the proposed wetland will be “hyper-accumulating” vegetation. These plants are able to absorb 400 times more salt. Along the lake will be native vegetation to reinforce bird and fish habitat. The tribe is currently fighting illegal dumping and contamination at their sites. Their project goal include reducing contaminants using water treatment ponds and wetlands. By forming nearby wetlands, their habitat is extended while filtering the Salton Sea. To stall the declining water levels and quality of the lake, agreements have been made to provide water from the cleaner Imperial Irrigation District. 20 illegal dump sites were mentioned in the Torres Martinez Solid Waste Collaborative August 2006 status report[8] consisting of used oil, hazardous waste, and tires.

Salton Sea's salt problems are being solved with time. Common solutions are not sustainable solutions. Forming pipes reaching to the Gulf of California or the Pacific Ocean causes more habitat

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5 http://www.nwhc.usgs.gov/publications/fact_sheets/pdfs/fact_salton2.pdf
6 http://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.abstractDetail/abstract/6759/report/F
7 http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/463ad28ec46bae98852570d8005e1726!OpenDocument
8 http://www.epa.gov/region09/tribal/torres-martinez/torres-martinez-solid-waste-status-report.pdf

alteration. Taking the salt out all together using methods like desalinization have unattractive costs and time. For the land that is not owned by the Torres Martinez tribe, the State of California is responsible by law to restore it. In the U.S. Geological Survey's Salton Sea Science Offices brochure, California is to "undertake the restoration of the Salton Sea ecosystem and the permanent protection of the wildlife dependent on that ecosystem"[9]. Since 2003, California is implementing a law called the Salton Sea Restoration Act aimed towards saving the lake. Salton Sea will not restore its habitat on its own when toxic waste is dumped and unsustainable agriculture runoff is allowed into waterways. With all that the lake provides to humans and wildlife, standing by idling as it dries out will cause a loss in money, lives, and a possibly sustainable lake.

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U.S. Geological Survey's Salton Sea Science Office

9 http://www.parks.ca.gov/pages/639/files/SaltonPDFlayout072908.pdf

http://pubs.usgs.gov/fs/2007/3097/pdf/fs20073097.pdf