

The Geography of the Sea



SEA FACTS

"Partly cloudy, highs near 105. With the humidity and heat, a chance of isolated thunderstorms in the area this afternoon through Thursday."

—Forecast for Imperial Valley, July 7, 1999

Typical summer weather? Yes it is, for this southeastern corner of California. An unlikely setting for the largest lake in California? Well, yes and no. In fact, the Salton Sea area is part of the Colorado Desert ecosystem, whose annual precipitation rarely exceeds four inches. The meager rainfall supports such drought-tolerant vegetation as desert scrub, creosote bush, saltbush, and tamarisk; the area's streams and springs, which ultimately drain into the Salton Sea, support cottonwood, willow, and other plants found in freshwater marshes. Of course, the botanical landscape also includes acres of agricultural lands, with crops that owe their existence almost solely to water imported from the Colorado River to the east.

The Salton Sea is not the first body of water to occupy the Salton Basin. Historic evidence and geologic studies have shown that the Colorado River has spilled over into the Salton Basin on numerous occasions over the millennia, creating intermittent lakes. Evidence of an ancient shoreline suggests that Lake Cahuilla occupied the basin until about 300 years ago. From 1828 to 1904, Colorado River flows flooded the Salton Basin no fewer than eight times. For example, an 1840 flood created a salt lake three quarters of a mile long and half a mile wide, and in June 1891, another outpouring of Colorado River

water created a lake 30 miles long, 10 miles wide, and six feet deep. So, how many times has Nature filled the basin with water over geologic time? There's no way we can know for sure, but humans have been responsible for inundating the basin only once.

In 1901 the California Development Company, seeking to exploit the Imperial Valley's potential for unlimited agricultural productivity, dug irrigation canals from the Colorado River. But heavy silt loads inhibited the flow, and new residents of the valley became worried, prompting the engineers to create a cut in the western bank of the Colorado, to allow more water to reach the valley. Unfortunately, water broke through the engineered canal and nearly all of the river's flow rushed into the valley. By the time the breach was closed, the present-day Salton Sea was created.

The Sea occupies the lowest portion of a structural basin called the Salton Trough, a seismically active valley that lies at the southern end of the San Andreas Fault and marks the northern extent of the Gulf of California Rift Zone. The northern end of the Salton Trough is bounded by the San Jacinto and Santa Rosa mountains to the west, the Orocopia Mountains to the north, and the Chocolate Mountains to the east. The area's highest mountain is Rabbit Peak, in the Santa Rosa Mountains, at 6,623 feet. The Salton Sea is longer than it is wide and stretches



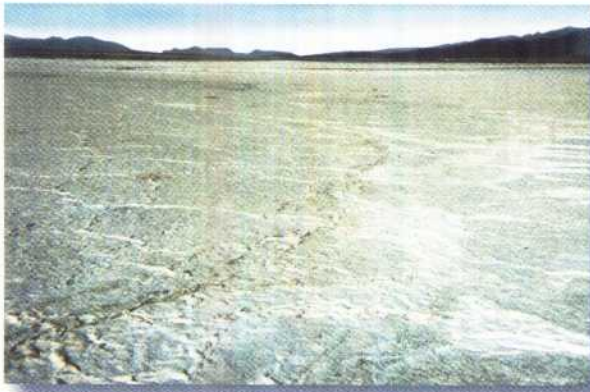
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along a northwest/southeast axis for approximately 35 miles. The southern half of the Sea is broader than the northern half, and the distance from the Salton Sea Test Base on the west shore to the Wister Waterfowl Management Unit on the east shore is approximately 15 miles. The Sea's current elevation is about 227 feet below mean sea level, its surface area is about 376 square miles, its maximum depth is 51 feet, and its total volume is about 7.5 million acre-feet.

The watershed of the Sea encompasses about 8,360 square miles and includes a small corner of San Bernardino County, some of Riverside County, most of Imperial County, the eastern portion of San Diego County, and part of the state of Baja California in the Republic of Mexico.



This salt flat near Bombay Beach is four to six inches thick. Water from the Sea periodically floods such low-lying areas, where it evaporates and leaves the salt behind. In the last century, entrepreneurs mined the area for salt, as the native people had done for generations.

Before the Salton Sea existed, the Salton Basin was well known to native people, explorers, and desert wanderers as a place with high concentrations of salt. You can still see portions of the trails walked by Native Americans of the Colorado River and the Pacific Coast on their long treks to bring salt from the Salton Basin to their villages. As early as 1815, ox-drawn carts were making the month-long expedition from Los Angeles to the Sea to supply new settlers

The agriculture industry was indirectly responsible for creating the Salton Sea. Today, the same industry is indirectly responsible for sustaining the Sea through runoff.

with the essential mineral, salt. In 1884, the economic value of salt was realized, and commercial mining began.

More recent economic activities in the area include the development of geothermal energy sources. Geothermal exploration began in 1957, and today several plants operate in Imperial County near Niland.

Ironically, the industry that played a supporting role in the Sea's creation—commercial agriculture—now has the lead in maintaining it, as the Sea is sustained primarily by agricultural drainage from the Imperial, Coachella, and Mexicali valleys (smaller contributions come from municipal effluent and stormwater runoff). Combined agricultural production in Imperial and Riverside counties amounts to well over \$2 billion annually. In 1998, the top five agricultural products of Imperial County were cattle, alfalfa, head and leaf lettuce, and carrots¹; in 1997, the top five agricultural products in Riverside County were milk, table grapes, eggs, nursery products, and hay.²

The Salton Sea offers many opportunities for recreation and is a popular destination for retirees seeking the serenity of the desert and the seemingly endless vistas of water, land, and sky—the Sea is so large that the distant shores are not visible in some areas due to Earth's curvature. The Salton Sea State Recreation Area occupies the northeast shoreline, while the Sonny Bono National Wildlife Refuge,

¹Imperial County Farm Bureau

²Riverside County Farm Bureau



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operated by the US Fish and Wildlife Service, spans the southern shoreline.

Because its salt content (somewhat greater than the Pacific Ocean) causes vessels to be more buoyant, surface travel on the Sea is known to be the fastest in the nation. The Sea is so far below sea level, its high atmospheric density causes engines to perform much more powerfully than on other lakes. In fact, most of the world's aquatic speed records have been broken here.

The popular sport fishery has been augmented over the years by numerous introductions of various fish species—striped bass in 1929, anchovy in 1948, halibut, croaker, bairdiella, mullet, and orangemouth corvina in 1950, grunion, flounder, sargo, and wrasse in 1951, threadfin shad in 1955, and tilapia in 1964. Such diversity has led to such fishing-oriented recreational developments as the Salton Bay Yacht Club, constructed in the 1950s, when the Sea was experiencing widespread popularity. In February



In this color-enhanced satellite photo, red represents mineral and rock types and green represents vegetation. The Salton Sea is in the center of the image, with the Orocopia Mountains to the northeast and the Santa Rosa Mountains to the northwest. The bright green area southeast of the Sea is the Imperial Valley, and the bright green to the northwest is the Coachella Valley. The diagonal strip to the southeast of the Salton Sea is the Algodones sand dunes. (Image processed by Lisa Heizer, San Diego State University, March 1994.)



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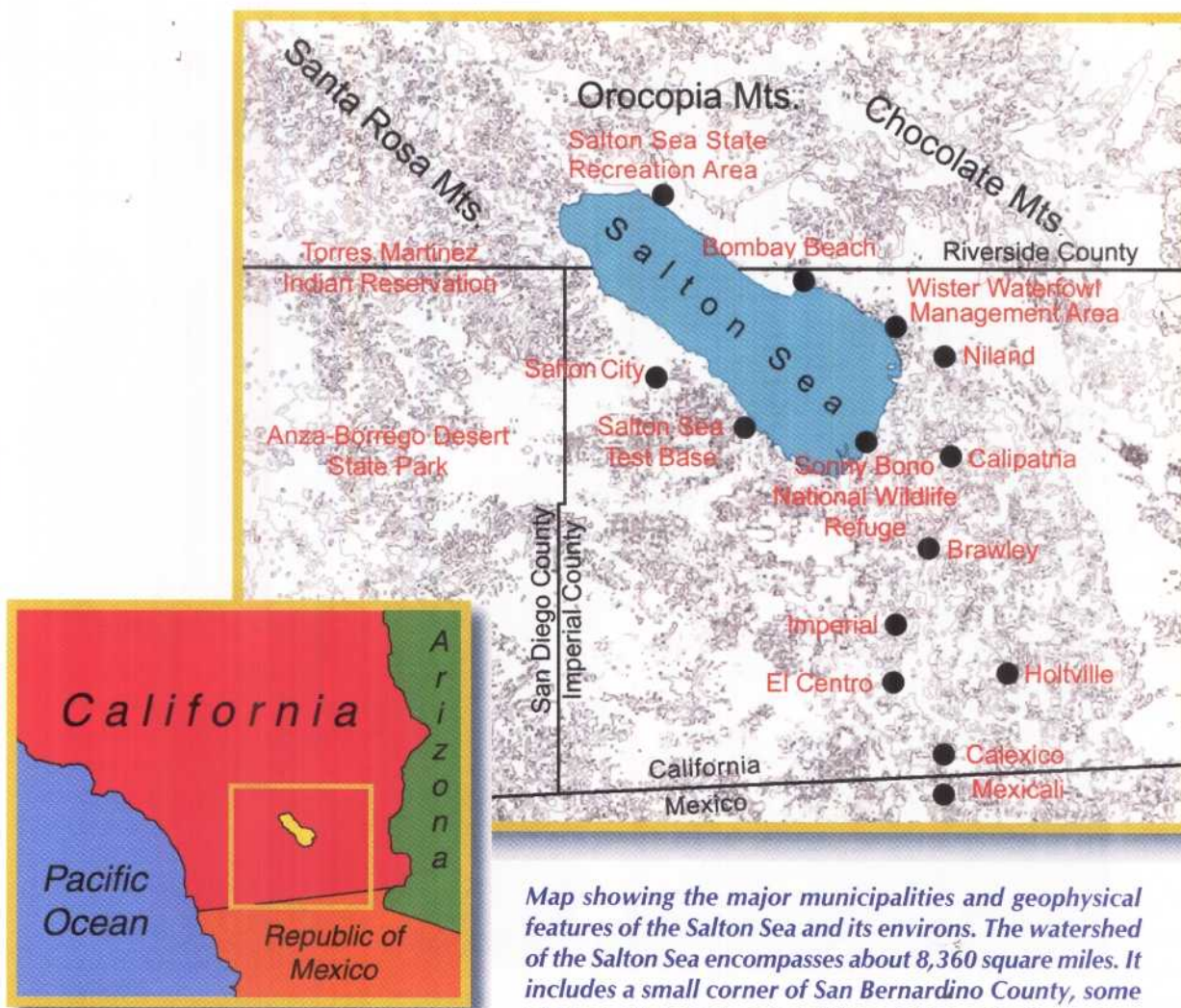
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1955, the Salton Sea State Park, later to become the Salton Sea State Recreation Area, was dedicated. At the time, it was the second largest state park in California.

The Sea and the wetlands along its shoreline are a critical part of the Pacific Flyway, providing permanent habitat and seasonal refuge to millions of birds, representing hundreds of species. The Salton Sea is

important to numerous migrating, wintering, and breeding bird species, particularly waterbirds. The Sea and adjacent wetlands, river systems, natural habitats, and agricultural fields also provide foraging and roosting opportunities. Typical mammals that inhabit the desert include bats and rodents, although most of the animals that flourish in this somewhat extreme environment are amphibians and reptiles.



Map showing the major municipalities and geophysical features of the Salton Sea and its environs. The watershed of the Salton Sea encompasses about 8,360 square miles. It includes a small corner of San Bernardino County, some of Riverside County, most of Imperial County, the eastern portion of San Diego County, and part of the state of Baja California in the Republic of Mexico. The Salton Sea occupies the lowest portion of a structural basin called the Salton Trough, a seismically active valley at the southern end of the San Andreas Fault.



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