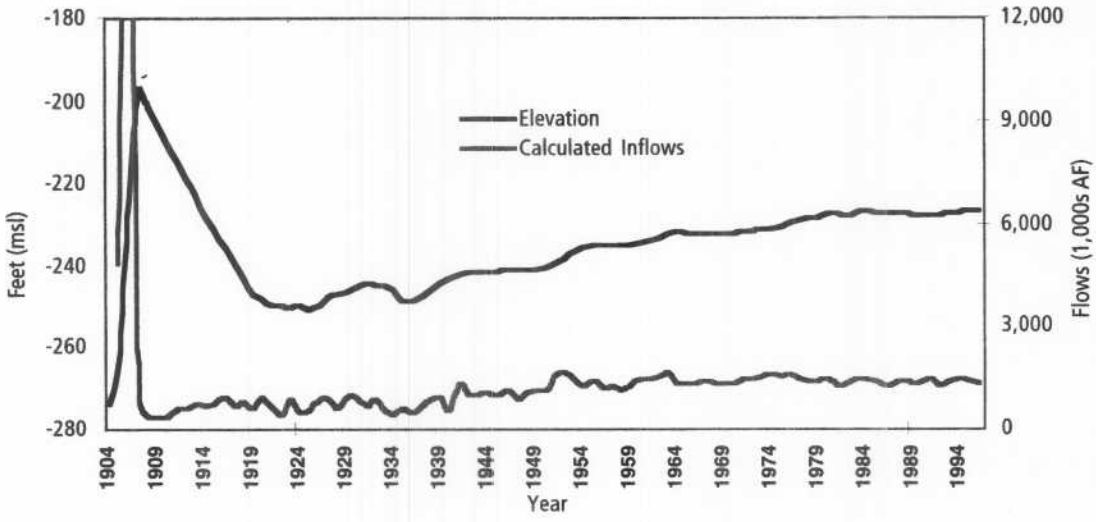
Figure 6
Elevation and Inflows of the Salton Sea 1905–1996



Sources: USGS, Dept. of Interior 1974, Tostrud 1997.

cultural drainage, the Salton Sea would completely evaporate in less than 10 years. Figure 6 shows the elevation of the Salton Sea, along with total annual inflows to the Sea.

The foundation for Southern California's agricultural economy is a legal framework guaranteeing ready access to large quantities of inexpensive Colorado River water (see Section III; Hundley 1975, Fradkin 1981, Reisner 1993). IID and the CVWD deliver a combined annual average of approximately 3.2 million acre-feet of Colorado River water to their respective valleys (Colorado River Board of California 1990 and 1992). Water use in the Mexicali Valley exceeded 2.4 maf in 1990, of which more than 1.6 maf came directly from the Colorado River and the remainder from groundwater (Morrison et al. 1996). A considerable portion of Mexicali's groundwater supply, however, originates as Colorado River water diverted for irrigation. Water that does not evaporate or transpire percolates into the aquifers after being applied by farmers. As a result, Colorado River water represents an even higher portion of total supply for the region.

The Imperial Valley boasts one of the most complex hydraulic engineering projects in the world, with nearly 1,700 miles of canals and more than 32,000 miles of subsurface tile drains that remove water used to leach salts and other constituents from the soil (IID fact sheet, undated). Roughly one-third of the water applied to agriculture in the Imperial Valley eventually makes its way to the Salton Sea, from surface and tile drainage. The remainder is accounted for through evapotranspiration or percolation or is embodied in the harvested crops.

Inflows to the Sea

Current annual inflow to the Salton Sea averages approximately 1.35 maf and has achieved a dynamic equilibrium with evaporation. The Sea is an officially designated repository or "sump" for U.S. agricultural drainage, which accounts for over 70 percent of total inflows (see Table 3). Roughly 10 percent of the total inflows to the Salton Sea originate in Mexico. Of Mexico's contribution, almost 75 percent is agricultural drainage and the remainder is municipal and industrial effluent (CH2MHill 1997). Total flows of the New River at the Mexican border averaged approximately 152,000 af/year from 1960 to 1995; total flows of the Alamo River at the border averaged

Table 3A
Average Annual Inflows to the Salton Sea by Source

Source	Percent	Acre-feet/year
Alamo River	45	605,000
New River	32	424,000
Agricultural Drains	9	123,000
Whitewater River	5	62,000
Groundwater	4	50,000
Rainfall	4	53,000
Other surface	2	29,000
Total:	100	**1,346,000**

Sources: USGS, USBR, IID, Ogden 1996, Tostrud 1997

Table 3B
Average Annual Inflows to the Salton Sea by Sector

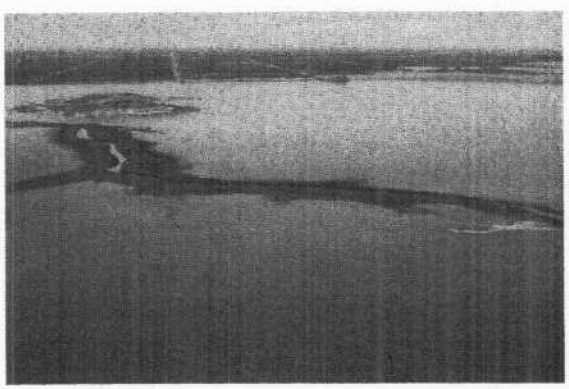
Inflows by Sector	Percent	Acre-feet/year
Agriculture	85	1,145,000
United States	77	1,040,000
Mexico	8	105,000
Municipal and Industrial	9	116,000
United States	6	80,000
Mexico	3	36,000
Natural	6	85,000
Total:	100	**1,346,000**

Sources: USGS, USBR, IID, Ogden 1996, Tostrud 1997

1,700 af/year (USGS 1970 et seq.). Considerable quantities of IID agricultural drainage join the New and Alamo rivers before they enter the southern end of the Salton Sea. The New and Alamo rivers each run approximately 60 miles before emptying into the Sea. Tables 3A and 3B show the source and average (1966–1995) annual quantity of inflows to the Salton Sea.

Inflows to the Sea vary annually in response to changes in cropping patterns, the amount of land irrigated, and irrigation methods, as well as changes in levels of precipitation and the implementation of water conservation measures. For example, the average annual flow of the Whitewater River for the period 1966-1985 was 89,000 acre-feet, but declined to 62,000 acre-feet for the period 1986-1995. This decline is partly attributable to changes in irrigation practices, as Coachella Valley farmers increasingly employed drip irrigation systems (CVWD 1996).

Monthly flows to the Salton Sea also vary over time. Figure 7 shows monthly inflows from the Alamo and New rivers for 1995. Changing quantities of inflows combine with seasonal changes in evaporation rates to raise and lower the elevation of the Sea. The elevation of the Salton Sea varies by as much as a foot annually, reaching its maximum elevation in late Spring and its minimum elevation in late Fall. Since the basin is relatively level, a small change in elevation can result in a large difference in surface area, inundating surrounding regions.



The Alamo River delta near the Salton Sea National Wildlife Refuge. (Courtesy of Jim Setmire)

Efforts to Decrease Water Use in the Basin

The amount of water flowing into the Salton Sea is likely to decrease in the future due to a variety of factors. Presently, California uses an average of 5.2 maf a year of Colorado River water. However, considerable pressure is being exerted on California by the federal government and Colorado River Compact states to reduce its consumption to its 4.4 maf legal entitlement. Given increasing water demands in Arizona and Nevada, Southern California will be unable to rely on unused

Figure 7
Monthly Inflows to the Salton Sea in 1995