

# **Hundreds of millions spent to protect Delta levees -- is it enough?**

**Mike Taugher, Bay Area News Group, 4-19-12**

Gilbert Cosio's truck rolled to a stop on a Delta levee recently fortified with \$4 million worth of rock and engineering.

On one side is a large lake formed when a different levee broke and flooded the area known as Franks Tract in the 1930s. On the other, grazing land and a much smaller lake formed when the fragile levee here failed and was quickly repaired in 1980.

Since then, hundreds of millions of dollars in voter-approved bond funds have been spent to reinforce levees that corral and shape today's Delta. For the first time, the state is on the verge of meeting a federal mandate to protect an area that is a key source of water for 23 million Californians and about 2 million acres of farmland.

But is it enough?

No expert considers California completely safe from the failure of century-old levees that protect a statewide water system, highways, a major railroad line and energy transmission routes, not to mention an aqueduct that serves the East Bay's largest water district.

Cosio, an engineer who has worked on Delta levees for decades, is among those who contend the threat is more or less manageable and that much of the pessimism is based on outdated information.

"We've been waiting around for levee money for 50 years," Cosio said. "We never had the luxury to build them as big as they needed to be. Now we do."

Others, however, shudder at the vulnerabilities that remain. They note that even though investments have helped bring levees up to a minimum standard established after the 1980 breach, it's a weak standard meant to address high water while the threat of earthquake damage is increasing. And it was always meant to be an interim step on the way to a more permanent level of safety.

"I think the Delta is the single most serious seismic vulnerability in the state," said Jonathan P. Stewart, an earthquake expert and engineering professor at UCLA.

Once a great marsh, the Delta today is a vast network of channels and sunken "islands" that begins where the Sacramento and San Joaquin rivers meet upstream of San Francisco Bay. The Delta and its 1,100 miles of levees -- many of which were first built in the years after the Gold Rush -- cover about 740,000 acres, nearly the size of Yosemite National Park or more than 1½ times the area of Contra Costa County. In addition to being a critical thoroughfare for migrating salmon and stopping point for birds on the Pacific Flyway, it is also perhaps California's most important water source.

Many of the engineering experts and scientists who have looked at the Delta's levees have come away alarmed about the possibility that a large earthquake could lead to multiple levee failures.