

“California Delta at Risk”
NPR, KQED
By Tamara Keith
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The storms that battered California over the weekend dropped several feet of much-needed snow in the Sierra Nevada mountain range.

The runoff from that snow melt this spring will be crucial for water resources in the Sacramento-San Joaquin Delta. That's the hub of a complicated water supply system that serves much of California.

But, if climate change predictions come true, the delta's role may change.

The Sacramento-San Joaquin Delta is where two major rivers and the San Francisco Bay come together. It used to be a wide-open marsh, where the balance of salt water and fresh water fluctuated with the tides.

Then a century ago, a thousand miles of levees were built, creating dozens of delta islands and draining the marsh. Now, there's a system of channels and pumps designed to carefully manage all the precious water that moves in and out of the delta.

On Sherman Island, one of the largest islands in the delta, is at the confluence of the Sacramento River and the bay, where the salt water meets fresh water. It is California's water supply.

"It comes down the Sacramento here, turns left and toward San Francisco Bay and is sucked back up to the pumps and is exported to 4 million people in the Bay Area, 3 million acres of agriculture in the San Joaquin Valley, and 21 million people in Southern California," says University of California Professor Jeff Mount.

Mount says climate change is conspiring against the fragile balance at work in the delta. In order to serve millions of Californians, the salty water of the San Francisco Bay must be kept away from the pumps that bring fresh water to cities and farms. It requires constant management and enough fresh water at all times to push the salt water back.

Change Drives Salt Inward

"The climate change is driving the salt inward," Mount says. "Where we are sitting now, which is now fresh because of heroic efforts that we're doing to manage water supply, this will inevitable be salty in the future."

Mount heads an independent board of California scientists advising the state. They are projecting the sea level could rise a foot by the year 2050 and 3 feet or more by the end

of the century. That means trouble for the levees, rock and dirt mounds that keep the water in its place.

Mount says there are two types of levees: Those that have failed, and those that will fail. On Sherman Island, wind-driven waves lap up against a rocky levee. During a typical storm, with extreme high tides, there's about a foot between those waves and the top of the levee.

"It's a game of inches out here. You're just sort of clinging to the edge here, with very little margin for error. Regrettably the sea level is rising. So, that's going to go over the tops of the levees much more often in the future," Mount says.

Islands Lose Elevation

And to make matters worse, delta islands lose about an inch of elevation a year, as soil is oxidized and blown away. That's a problem because, as Mount puts it, nature abhors a vacuum.

"We may be as much as 15 feet below sea level. And just on the other side of this levee is water that is at or above sea level, and it is trying real hard to get in here. And it is just that crummy little levee that is keeping it from getting in here," he says.

Mount and most delta experts agree that the current situation in the delta isn't sustainable. Eventually, that fragile balance of salt and fresh water will shift in favor of salt.

"It's going to do one it of two ways," Mount says. "It's going to do it gradually — sea level rise and changes in inflows — or it's going to do it suddenly through the collapse of the levees."

And if there's a major levee collapse, Mount says, water will rush in so quickly it will suck salty water out of the bay and into the delta in what Mount calls "the big gulp."

"Just the noise of the water rushing into this island, and it's the sound of like a waterfall as this rushes in, and scours this hole in the ground as the water rushes in, and hurling pieces of soil way out onto the island. I mean, the power of these levy breaks is immense, unimaginable, and there's nothing you can do about it," he says.

California's political leaders are now debating alternative plumbing scenarios for the state's water supply.