

San Francisco Bay: Race to build wetlands is needed to stave off sea-level rise, scientists say

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Updated: 10/18/2015 07:38:14 PM PDT

MercuryNews.com

San Francisco Bay is in a race against time, with billions of dollars of highways, airports, homes and office buildings at risk from rising seas, surging tides and extreme storms driven by climate change.

And to knock down the waves and reduce flooding, 54,000 acres of wetlands -- an area twice the size of the city of San Francisco -- need to be restored around the bay in the next 15 years.

That's the conclusion of a new report from more than 100 Bay Area scientists and 17 government agencies that may help fuel a regional tax measure aimed at addressing the looming crisis.

The other alternative, the report found, is to ring large sections of the bay with seawalls and levees in the coming decades. But that would destroy many of the marshes and probably cost taxpayers more in the long run.

"If we don't change our approach, we'll see the marshes and mud flats start to drown," said Letitia Grenier, a biologist with the San Francisco Estuary Institute, a scientific research organization in Richmond.

"They'll start to erode," said Grenier, one of the report's main authors. "We'll have bigger waves coming in on high tides and storms -- and more flooding. We'll lose our wildlife. And eventually the wetlands will be gone. You'll see levees and concrete seawalls. The water in many places will be higher than the land, like it is in New Orleans."

San Francisco Bay already has risen 8 inches since 1900, according to the tidal gauge at Fort Point, underneath the Golden Gate Bridge.

Driven by melting ice and expanding warming water, the bay and the Pacific Ocean off California will rise up to 1 foot in the next 20 years, 2 feet by 2050 and up to 5 feet by 2100, according to a 2012 study by the National Academy of Sciences.

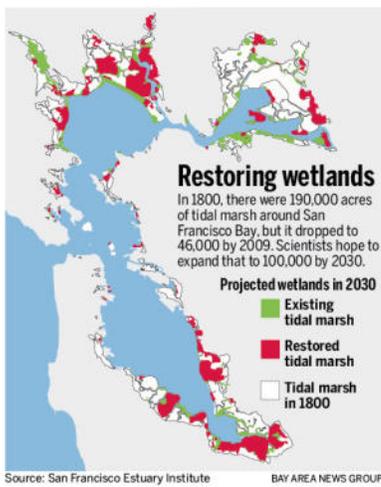
Last year was the hottest year recorded on Earth since modern temperature recordkeeping began in 1880. This year is on pace to break that record. And the 10 hottest years all have occurred since 1998.

Similar to the way that Hurricane Sandy sent ocean waters pouring into New York City subways three years ago, low-lying areas around San Francisco Bay face major threats as sea level rises, the report found.

Experts say some places will need seawalls, including the San Francisco and Oakland airports, Treasure Island, downtown San Francisco and shoreline communities like Foster City.

But in other places, there's still time to work with nature rather than against it, according to the report, titled "The Baylands and Climate Change: What We Can Do." That means restoring large sections of hayfields in the North Bay near Highway 37 and former Cargill Salt industrial salt ponds in the South Bay back to tidal marsh, along with areas along the western and eastern sides of the bay.

Experts say time is running out because once the more severe sea level rise starts, restoring wetlands will be more difficult and expensive.



"We're at a critical crossroads. What we do in the next 15 or 20 years will largely determine what San Francisco Bay is going to look like 100 years from now," said Sam Schuchat, executive officer of the California Coastal Conservancy, a state agency that helped coordinate the report.

Wetlands provide natural flood protection by breaking up wave energy. They also filter pollutants, offer recreation for hikers and bicyclists, and are home to hundreds of species of fish and wildlife -- from salmon to snowy egrets to harbor seals.

Since the Gold Rush in 1849, San Francisco Bay has shrunk by a third because of diking, development and filling. That largely stopped in the 1980s because of state and federal laws. Now the goal is to expand the bay back out.

In 1999, there were 40,000 acres of tidal marsh left around the bay, an 80 percent loss from 1800.

Scientists in 1999 wrote a report calling for 100,000 acres to restore the natural processes of the bay. Since then, 6,000 more have been restored, and another 26,000 acres have been purchased by state and federal agencies.

To reach the goal of 100,000 acres of healthy wetlands, the 26,000 acres has to be restored -- and another 28,000 acres purchased and restored.

Total cost estimate: \$1.5 billion, Schuchat said.

"It's a lot of money, but it's cheaper to do it now than to wait for bad things to happen and then do things in a hurry down the road," he said. "We have a shot of maintaining what is really special about the bay and living in the Bay Area."

A coalition of groups -- including Save the Bay, the Bay Area Council, Audubon California and the Silicon Valley Leadership Group -- is working on a \$12 annual parcel tax for all nine counties around the bay. The groups are expected to place the measure, which would raise \$500 million over the next 20 years for wetlands restoration and flood control, on June ballots.

"There's a strong scientific reason for accelerating this marsh restoration work," said David Lewis, executive director of Save the Bay. "The main missing ingredient is funding. The sooner we get started, the more successful it will be."

There are other big challenges, however. Restoring marshes and raising their elevation requires millions of tons of sand and mud. Each year, roughly 2 million cubic yards is dredged out of shipping channels by the Port of Oakland and other harbors. But two-thirds of that is dumped in the ocean because it's the cheapest disposal method.

To use most of it to create new wetlands, federal rules have to be changed. More sediment also can come from cities re-engineering how they route streams to the bay, as well as water agencies removing sediment from behind dams.

"We've been fighting nature for so many centuries, but now we've won," biologist Grenier said. "Now to support ourselves, we need to work with nature."

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To read the report titled "The Baylands and Climate Change: What We Can Do," see www.baylandsgoals.org