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## **Sacramento officials prepare for the worst -- massive flooding**

State and federal agencies race to complete work designed to prevent the \$25-billion disaster that could result if the rivers surrounding the capital city overflow or breach aging levees.

By Eric Bailey

Los Angeles Times Staff Writer

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SACRAMENTO -- — California's capital city may be best known for politics, but it has another claim to fame: It's America's most flood-threatened city not named New Orleans.

A recent state report predicts that the right combination of unlucky weather conditions could put some parts of the city under more than 20 feet of water, causing a \$25-billion disaster that would cripple state government and ripple through the California economy.

Authorities are racing against time to strengthen the earthen levees that ring nearly the entire city to hold back the swollen American and Sacramento rivers.

"Every winter we hold our breaths and hope this isn't the year something happens before we can finish the work," said Sacramento County Supervisor Roger Dickinson. "There is a sense of the clock ticking."

When heavy rain begins to fall, folks here peer nervously at the sky and riverbanks. And Stein Buer -- the person perhaps most responsible for their fates -- frets and prepares.

"I never sleep during storms," said Buer, executive director of the Sacramento Area Flood Control Agency, which is working with the state and federal governments in a multibillion-dollar effort to avert catastrophe. "It's the nature of my responsibility."

Worst-case scenarios project 500 dead, 102 square miles flooded, 300,000 people uprooted, an international airport and state agencies under water, and years of recovery.

To avoid that outcome, Buer has plotted strategy, navigated bureaucracy, even joined crews tossing sandbags.

He isn't going it alone. The U.S. Army Corps of Engineers, the Federal Emergency Management Agency and the federal Bureau of Reclamation all have stepped up prevention efforts since Hurricane Katrina devastated the Gulf Coast in 2005. State flood experts and Gov. Arnold Schwarzenegger, meanwhile, are pushing to buttress the Central Valley's 1,600 miles of levees.

The aim, with the help of nearly \$5 billion in state bond money approved in 2006, is to

double Sacramento's flood protection over the next decade.

Work began recently on a \$683-million Folsom Dam spillway channel that would more quickly lower the lake as a mega-storm approached the American River's 18,000-square-mile watershed. Along the Sacramento River, which drains 23,000 square miles of Northern California, crews have reinforced aging levees near some of the most flood-prone neighborhoods.

But in Sacramento's fastest-growing neighborhood, big trouble still looms -- even without a flood.

Amid farm fields north of downtown, the subdivisions of the Natomas Basin spread along the lazy curves of the Sacramento River. A century ago, the river would reliably overflow and turn Natomas into a vast inland sea. Today, floodwaters could be 23 feet deep if it weren't for the levees.

Though they were upgraded during the 1990s, those earthen walls are now deemed at risk by federal regulators, mostly because the standards have toughened since Katrina.

The upshot for Natomas and its 70,000 residents is a de facto building moratorium and higher flood insurance rates set to kick in at year's end.

Builders are squawking. Homeowners are uneasy. Environmentalists question the wisdom of ever building there.

"To me, floods are the biggest risk to public safety we face and the biggest risk to our economic viability," said Sacramento Mayor Heather Fargo, head of the flood control agency's board. "In our 12-step recovery, we are way beyond denial."

Sacramento has spent 150 years getting to this point. Settlers experienced the first floods not long after John Sutter built his fort near the rivers' confluence. High waters caused an epidemic of cholera. In the flood of 1862, Gov. Leland Stanford traveled to his inauguration via rowboat.

Civic leaders hauled in dirt to raise downtown streets by 10 feet, turning first floors into basements. Levees narrowed the rivers, boosting their velocity to help wash away gold-mining debris flowing out of the Sierra.

But pinching the waterways laid the ground for the trouble to come. A constricted river is a river that wants to escape.

For the first half of the 20th century, the rivers mostly stayed within their banks. With completion of Folsom Dam on the American River in the mid-1950s, leaders thought the peril had passed. But record storms hit the region over the next quarter century, one filling the new reservoir in a week.

A 1986 storm that dumped rain for 11 days delivered the big wake-up call. The rivers came within half a foot of topping the levees. With concern growing, the Sacramento flood agency was formed in 1989.

Meanwhile, the city grew fast, particularly in threatened areas like Natomas.

"They placed a higher value on tax and economic growth than public safety," Jeffrey Mount, director of UC Davis' Center for Watershed Sciences, said of city leaders. "Call it the Clint Eastwood strategy: Do you feel lucky? New Orleans lost the battle of the inevitable, because inevitably it happens."

Buer, a native of Norway, came on board four years ago, after a quarter century with the state. His mechanical-engineer father, Buer said, was reluctant to "live out his life in a little town in Norway waiting for the sun to come out" and took the family to the U.S. when Buer was hitting his teens.

As a boy, Buer remembers watching the high waters of 1964 carrying trees downriver. The Buers built kayaks that first summer, and he's been paddling ever since, both as a river guide and recreationally to gain an intimate perspective on Western waterways. Mount calls him "as competent a flood manager as there is in California."

With biology and engineering degrees, Buer brings an interdisciplinary approach to securing Sacramento. Plans for Natomas, he stresses, should not only curb floodwaters but also help such creatures as the Swainson's hawk and the giant garter snake by preserving habitat along the levee.

Put him in front of a whiteboard and Buer turns professorial, explaining levee physics and cost-benefit ratios.

The biggest risk, he says, is that one of the rivers might breach the levees, sending a wall of water into neighborhoods. The storms of New Year's 1997 spared Sacramento, but busted levees in several rural Sacramento Valley communities killed nine people, caused \$2 billion in damage and destroyed 23,000 homes.

Buer said the trick "is to keep the ground from exploding under your feet." The river can seep through and under the levees. With high flows applying tremendous hydraulic pressure, water can burst through like a fountain, eroding a levee's backside.

To prevent that, authorities plan to add 5 million cubic yards of dirt and rock to thicken the flanks of levees in Natomas. They've already hardened levees all over town, forming a near-impenetrable wall by carving deep trenches and pouring in a cement slurry.

Flood-threatened residents have proved willing to face the risks and step up financially. Tax assessments have passed with better than 80% approval. In Natomas, the city has distributed flood-emergency kits to residents. High school students were drilled on how to help in a flood.

If all goes according to plan, construction to shore up Natomas levees should begin next year. The basin's flood walls, capable of withstanding the sort of big storm that has a 3% likelihood of hitting any given year, should be six times stronger by 2012.

Home builders question why an area they once dubbed "Fortress Natomas" has been singled out by federal regulators. An industry-commissioned study contends a three-year halt in development to allow for flood-control improvements could cost the regional economy \$3.1 billion. Gregory Thatch, an attorney for basin developers, worries the controversy "will put a pox on the area for years to come, even after the levees are fixed."

Ron Stork, a policy analyst with the environmental group Friends of the River, says the pox should be on leaders who "put the interests of land speculators ahead of protecting lives."

Buer doesn't wade into such skirmishes. He's busy making sure the citizens of California's capital aren't left wading away from their homes.

"We're a lot safer than we were in 1986, we're a lot safer than '97, and we'll be a lot safer in a few more years," Buer said. "I do not expect to see this town underwater."

[eric.bailey@latimes.com](mailto:eric.bailey@latimes.com)