

# California's Delta Water Blues

*Can California build the new water system experts say it needs — before an earthquake brings the levees down?*

**Paul Tullis, Miller-McCune online magazine, 1-3-11**

*“Complaints are everywhere heard that the public good is disregarded in the conflict of rival parties.”*  
— James Madison, The Federalist, No. 10

**G**ilbert Cosio stands with his feet spread, one foot higher than the other, astride a sloping, 100-year-old levee surrounding Bouldin Island, 40 miles due south of Sacramento, Calif. We're here to take a look at improvements that Cosio, a civil engineer, has made to this levee, part of a serpentine network of flood control infrastructure that was imposed piecemeal over the course of the 19th and 20th centuries on the largest estuary on the West Coast of the Americas, the Sacramento-San Joaquin River Delta.

The levee was originally made from dirt that Chinese “coolies” dredged from the swamp to carve out cheap farmland for California's new white settlers. Today, it and the hundreds of Delta levees like it must do more: They must — as they've been doing since the 1850s — keep the water out of the farms, many of which have fallen below sea level because of soil subsidence. But they must also keep San Francisco Bay, contiguous to the Delta's western edge, from flowing into the Delta. The miles of levees surrounding Delta land also confine the estuary itself, creating a quasi-natural reservoir for freshwater that's pumped to 28 million people and billions of dollars of croplands, from Silicon Valley to San Diego. And the levees don't just protect farms and the estuary; they keep cities and suburbs and crucial infrastructure dry.

Which is why Cosio's expertise was needed; ancient and earthen are not qualities one would select for a wall protecting the clean water supply for 76 percent of the world's ninth-largest economy. It's a disconcerting wall, too, one that gives an observer standing behind it the odd sensation — familiar to anyone who's been to New Orleans — of looking up toward a body of water.

Indeed, the day before I met Cosio, state Sen. Joe Simitian, the Palo Alto Democrat who pushed through the state Legislature a historic package of bills that will determine a host of water issues in California over the next generation, including what to do with the Delta, told me the Delta is “California's Katrina waiting to happen.” If, in a flood or an earthquake, a large number of levees fail at once — and there are 1,300 miles of them, a stretch longer than California's Pacific coastline — up to 515,000 residents and 520,000 acres of farmland will be at immediate risk. Millions more acres and large urban areas will lose access to a major source of their water for months, or even years, as saltwater from the adjacent San Francisco Bay flows in.

Cosio believes this is largely hype. He's been working on these levees his entire 26-year career. Visual inspection, physical monitoring, magnetic anomaly studies, ground-penetrating radar and geomorphic studies are a few of the tools he and his colleagues at MBK Engineers use to assess levee condition. He wants to impress upon me the idea that these levees are, in fact, relatively safe.

“In our mind, the glass is half full,” he says with a chuckle, compared to “25 to 30 years ago, when the glass was totally empty. We think there's room for improvement, but they're a lot better than they used to be.”

This kind of talk is heresy in California. Politicians, the policy advisers who brief the politicians, the academics who provide the research that informs the advisers, and nearly everyone else in a position to know will tell you that the levees are in a perilous state. They all agree there's a danger of catastrophic flooding after an earthquake, and everyone knows such a quake will strike eventually: Geoscientists say there's a 63 percent chance of a 6.7-or-greater earthquake along the Hayward fault, 40 miles west of the Delta, by 2036; there are at least six other faults that lie even closer. It's not just earthquakes, either: Rainstorms, sea level rise, tree root malformations, even beavers — a 2004 breach that took six months and \$90 million to mitigate is believed to have been caused by a beaver — can cause a levee to fail.

Allies as unlikely as Southern California water districts and some Northern California environmentalists have agreed on a potential solution: massive, multibillion-dollar infrastructure — a canal or a tunnel or both — to convey much of the water feeding the Delta around it, instead of through it, and then to farms and cities to the south and west. Experts across disciplines largely agree that such a conveyance is the best of several possible, if sub-optimal, solutions. But because the levees are only the catalyst for addressing a multitude of complex and intertwined water supply, infrastructure, public safety and environmental issues in the Delta, the question of what to do about the levees has gone unaddressed for decades.

Cosio represents just one of many stakeholder groups, the “in-Delta interests” that want to improve the Delta within the existing water-delivery and levee-maintenance systems. Other interests include corporate farmers to the south, who want as much water as they can get out of the Delta; urban water utilities, also mainly southern, which want the same thing; and environmentalists, who for the most part want water to stay in the Delta for the benefit of fish and birds.

And finally, there are the dozens of local, state and federal agencies with some authority over the Delta or some aspect of it, whose role sometimes seems to be just to screw everything up for everyone else.

Jay Lund, director of the University of California, Davis, Center for Watershed Sciences and a professor of environmental engineering, assesses the situation this way: “There are enough stakeholders in this system who can say, ‘I can better my interest by being curmudgeonly.’ And if enough people feel that way, you can delay the canal until the earthquake occurs.

“That's the nightmare scenario.”

**T**he Delta levees weren't built for their current purpose. The federal Swamplands Act of 1850 provided incentive for the young nation's settlers to “reclaim” the dirt under wetlands by draining marshes from the Everglades to California. That suited the Delta fine, for a while: Snowmelt from the Sierra and rain on the plains washed down the Sacramento, San Joaquin, Mokelumne and Calaveras rivers, providing plenty of water for local irrigation and still satisfying the needs of the ecosystem. Delta land wasn't worth much — settlers had originally paid \$1 per acre, and the water table is too high to cultivate deep-rooted, high-value crops — so the occasional flood or levee breach was no big deal.

Then, as California's southern cities expanded and the Bay Area urbanized, the old levees were given new duties: Protect urban developments in and around the Delta, and keep San Francisco Bay's saltwater out of it. With the construction of the federal Central Valley Project in the 1930s and the California State Water Project in the 1950s, freshwater deposited in the Delta by winter rains and spring runoff could be pumped out of the Delta to the agricultural lands of the San Joaquin Valley and the lawns and swimming pools of Southern California.

It wasn't long before it became clear the levees were no longer up to their new tasks, structurally speaking, so in 1973, the state Department of Water Resources began providing local agencies with funds to improve them. But in 2003, in a surprise legal decision, a judge put the state on the hook for \$450 million in damages sustained when a levee broke in rural Yuba County. The state suddenly became very interested in a long-term fix. "I can't say enough good things about those engineers," Lund says. "They have kept this system going for a long time. But they have not seen any real earthquakes."

In 2008, after years of study, the Public Policy Institute of California, a nonprofit, nonpartisan think tank, issued a report, "Comparing Futures for the Sacramento-San Joaquin Delta," which looked at a number of alternatives to Delta management. Lund co-authored the report; Simitian told me he "can't recall an academic study that had such consequence in terms of our policymaking."

One option the report examined would halt all water exports from the Delta. That route, Lund and his colleagues found, would be best for the Delta's fish, but worst for pretty much everyone else and, therefore, politically challenged.

The report found a second option — the status quo — to be "both risky and unsustainable," as well as bad for the fish.

Option three is the "peripheral canal" — a term I'll use as shorthand for the various canal, tunnel, pipeline and combination proposals for a new, isolated conveyance facility that would collect water from rivers before it gets to the Delta and move it around the Delta to pumps at its southern edges. If constructed wisely, this "canal" would protect the freshwater supply should there be levee collapses.

In 1982, in one of the harshest water fights in the history of a state pockmarked by them, voters rejected a proposal to build a peripheral canal, largely because of environmental concerns and the fear that the canal was a *Chinatown*-style water grab by Southern California. The peripheral canal has never really come close to approval since then, but it's an idea that keeps coming back because it's as alluring to some interests as it is horrifying to others.

In 2006, Gov. Arnold Schwarzenegger issued an executive order forming the Delta Vision Blue Ribbon Task Force. The task force's final report, issued two years later, recommended singular, strong governance to supersede the hodgepodge of agencies that have some say over the Delta. After three years of wrangling that was extraordinary even for California's dysfunctional Legislature, Simitian's bill passed, taking the Delta Vision recommendation and creating a new seven-member governing body, the Delta Stewardship Council. The council includes representatives from every possible stakeholder group, including in-Delta interests, enviros, Big Ag, Southern California water agencies, developers and manufacturers.

One of the council's first acts was to award a multimillion-dollar contract to a Colorado engineering-infrastructure firm to help form the Delta Plan required by the council's enabling legislation. Observers saw this move as a clear indication that the council is tilting toward recommending a canal. There were other suggestions, too, including the Legislature's rejection of a bill requiring its approval before the state could begin building a canal. Taken together, the tea leaves would all seem to verify the beliefs of those who think the California powers that be are dead set on building a peripheral canal.

Dante Nomellini Sr. is one of those people. If you wind him up, in fact, he will sit you down in a back room at his firm in Stockton, at a long table covered with rolled-up schematics and old maps, and speak for three hours

about Delta water issues in a nearly uninterrupted stream of acronyms, jargon and expletives. Nomellini grew up in a farming family in Stockton, a city of 290,000 on the Delta's eastern edge. He was trained as a civil engineer in college, then went to law school and ever since has been representing groups of landowners sharing common levees. This combination and duration of experience – he's in his 60s – pretty much makes Nomellini the personification of in-Delta interests.

Nomellini believes Simitian's package of water bills is a Trojan horse to rationalize a canal. "I've seen it before; it's a standard practice," Nomellini says. "You get a bunch of people in a room and say, 'How are we gonna do this? Let's get a blue ribbon commission to bless it, then we'll make the run legislatively.' It's intended to carry out the wishes of the present administration well after it's out of office."

The us-versus-them sentiments Nomellini expresses have reached such a state that 170 Delta landowners have refused state workers access to their land to survey for a possible canal or other conveyance facility. But fear and loathing of a peripheral canal is hardly confined to in-Delta interests.

**E**nvironmentalists have the same problem with a canal that they have with the status quo: They worry it would divert too much water out of the Delta, savaging its ecosystem, just as too much is pumped out today. For years, enviros have been deploying a strategy to protect the Delta similar to the one that successfully protected redwood forests in the 1980s and '90s: get a resident species declared threatened under the Endangered Species Act, thereby forcing the federal government to protect its habitat.

Back then, it was the northern spotted owl; today it's the Delta smelt. In 1994, a coalition of environmental groups sued the federal government over the tiny fish, leading federal Judge Oliver W. Wanger to order drastic reductions in water deliveries from the Delta. The smelt is, of course, just a stalking fish for others that suffer from reduced freshwater flow into the Delta, including salmon.

As a practical matter, though, greens are split on whether to build a canal. Some feel it's a *fait accompli*, so they might as well be at the table to negotiate. Others believe the process is so skewed in favor of other interests that they're better off trying to block the canal. "We're not against an isolated facility, *per se*," says Jim Metropulos, a senior advocate at the Sierra Club, which opposed Simitian's legislative package. "We need to see something that limits exports and allows in-stream flows [sufficient] for native species."

The Delta Stewardship Council is to formulate such a plan by the end of next year. If it's found that an isolated facility can be built to the highest environmental protections, the council must include the canal as part of its plan. Environmentalists, then, will be backed into a corner: They'll have been told the canal can be built in a sensitive way, and they'll look curmudgeonly if they oppose it.

But how much water is eventually diverted from the Delta to the canal will continue to be measured against how fisheries are recovering. It's basically the same process that has transpired since Judge Wanger issued his first order limiting water exports in 1994, with all the appeals, countersuits, studies and editorials since then having brought no resolution. If history is any guide, the agricultural and urban interests will fight tooth and nail to get as much water as possible into the canal – and fight again to get even more water after an agreement is reached.

Nomellini says he's seen it many times: An agreement is signed stipulating who gets how much Delta water when, and then it's violated — always, as he sees it, at the expense of the Delta. "I try to explain to the environmentalists periodically that this is a vicious game," Nomellini says, "and when you fall off the turnip truck, these guys don't just leave you in the dust; they back the truck over you."

“And that’s what’s happening. These guys don’t care about the fish. They go fishing in Argentina or Alaska.”

If a powerful-enough earthquake strikes, the levees in the Sacramento-San Joaquin Delta that have sand at their bases — and there are a lot of them — will liquefy, at least partially. As water pours through breaches caused by liquefaction, osmosis will draw saltwater from the west into the Delta; any levees not destroyed by the earthquake will face additional pressure from this rush of water.

Delta engineers say that official reports have wrongly extrapolated data on a few vulnerable sand levees to stronger levees now fortified with rock. Cosio says he can build a levee to withstand an earthquake, something that will hold up at least well enough to give him and the other major engineering firm dealing with the levees, KSN Engineers, time to repair it before the Delta salinates.

But Lund, the UC Davis engineering professor, lacks Cosio’s confidence, to say the least. “I am aware of no levee engineer who works outside of the Delta,” he says, “who has looked at those levees and not basically run away in horror.” And even as he projects a rosy view of the levees’ survivability, Cosio agrees that something needs to be done to protect the Delta. “When you think about it, the definition of risk is the probability of failure times the [consequences]. Well, if the water system goes down, the consequences are huge,” he says. “So it really doesn’t matter how low the chance of failure is, because if there’s any probability at all, the risk is going to be high.”

Cosio’s prescription for Delta protection is, of course, continued efforts to armor levees. But fixing all the levees to a standard for urban protection would cost billions. And an \$11 billion bond measure that included up to \$750 million for levee repair was yanked from the November ballot at the last minute out of fear it would fail to pass muster with California’s recession-spooked electorate.

So if the levees can’t be fixed to withstand the earthquake almost certain to come, what are you left with? A canal, tunnel, pipeline, or some combination, to carry a large part of the state’s freshwater supply around the Delta. But of course, the process of getting to a canal — like everything about California water and the Delta — is as complicated as 3-D chess and fraught with power politics.

The State Water Resources Control Board would issue the ultimate permit for a peripheral conveyance, but it will probably act in accordance with the Delta Stewardship Council recommendation. If funding for the canal/tunnel is approved, however, measures to mitigate environmental damages associated with its intakes, among other things, will catapult the cost, initially projected at around \$4 billion, to a staggering \$53 billion, by one estimate.

In the end, then, there are no good solutions to the problems of the Sacramento-San Joaquin River Delta, and the least bad of those now on the table has a daunting array of political, procedural and financial barricades — all manned by true believers ready to fight hard for their causes — standing in its way.

Toward the end of an interview, Lund waxed philosophical, in a way that probably encapsulates the situation as well as a thousand public policy studies: “In the U.S., we hate government; we hate government so much, we have thousands of them. Having that very distributed power is wonderful in many ways; it’s a very good system for making incremental changes.

“But when you fall into a situation where, to avoid disaster, you have to make a big change involving hundreds of agencies, millions of people and enough of them signing off — it’s really hard. And I think that’s where we

are with the Delta. Those levee engineers in the Delta will say, 'Give us another few million or billion dollars, and we'll keep 'em going.' No, you won't. You'll keep 'em going a little while longer, till a big earthquake hits.

"If [that happens], and the water gets turned off, the governor will come in and say, 'OK, that's it — under my emergency authority, we're gonna build a peripheral canal.' But this will be without the environmental safeguards, without lining up the financing and all the things you want to have in place to really make this work. So the water-supply interests lose, the Delta interests lose, the environmental interests lose, the taxpayers lose.

"If they had come to agreement, the Delta islands people could've been compensated, the transition would've been easier, the canal would've been built better and more economically, with more environmental safeguards. [So] we fail into a solution that is inferior to what we couldn't agree on. Because this thing could happen tonight.

"If this place started to shake, you'd have a hard time getting across the Delta an hour from now."