# Major S.F. Bayfront Developments Advance Despite Sea Rise Warnings

**Kevin Stark, Winifred Bird and Michael Stoll, KQED (San Francisco television), 8-6-15**

Like every body of water that opens onto a global ocean, San Francisco Bay is virtually guaranteed to rise several feet in coming decades, climate scientists say. But that has not deterred real estate developers from proposing and building billions of dollars worth of new homes and offices in bayfront areas that current climate change predictions show could flood by century's end.

Land-use records and environmental applications reveal that the building boom, fueled by a white-hot tech economy, is moving too fast for regulators to keep pace. Most cities and regional agencies have not yet adopted tools to address flooding in areas where thousands of acres are threatened by sea level rise.

Even the scenario widely considered 'most likely' would put thousands of acres of the current shoreline underwater.

Developers say they have engineering and financial solutions to deal with any reasonable future flooding risk. But critics, including climate scientists, urban planners and environmental activists, say the current wave of construction might leave taxpayers on the hook for enormously expensive emergency protections and repairs.

Researchers studying climate change predict that the rise in ocean levels will accelerate later this century as the atmosphere heats the ocean and melts glaciers. Many of their models show that by 2100, occasional flooding could reach as high as 8 feet above current high tide, in the event of a severe coastal storm.

Even the scenario widely considered "most likely" — 3 feet of permanent rise — would put thousands of acres of the current shoreline underwater.

Developers are planning or currently building at least 27 major commercial and residential complexes around the bay on land lower than 8 feet above high tide, as estimated by recent aerial surveys. And more than a dozen Bay Area cities continue to issue permits for plans that address future flood risks vaguely, if at all.

Google, Microsoft, LinkedIn and Facebook are among the marquee corporate names driving the bayfront explosion. Some cities are even courting companies to build near sea level, often on landfill created in the mid-20th century in former salt marshes. Much of that land could return to the sea, unless cities erect seawalls, levees and other monumental edifices.

Kristina Hill, a professor of environmental planning at the University of California, Berkeley, said more experimentation is needed in waterfront construction techniques. But few businesses are invested in fortifying the properties they build beyond midcentury. It is hard to fund resilient architecture, Hill said, when developers "do not have a shared interest with the public about what will happen with those properties in the future."

In many areas, new development includes desperately needed housing. Projects now in the pipeline in San Francisco would add 25,000 new apartments. On Treasure Island alone, developers are ready to break ground on a forest of residential towers that could house 12,000 people, and at Mission Rock and Pier 70, developers have pledged to build more affordable apartments than the city requires.

Corporate and government data show that the highest-profile building projects on the shorelines of San Francisco, Silicon Valley and the East Bay will cost more than $21 billion to build, excluding the value of the land underneath them.

That does not account for the likely public cost, coming within decades, of protecting these settlements with dikes, levees and artificial wetlands — or for the economic toll of abandoning development in designated buffer zones as waves rise.

A few local governments, including Mountain View, are beginning to spend money on sea level rise infrastructure projects that can protect waterfront business districts.

And San Francisco is in its second year of interdepartmental planning to address sea rise. But the city has yet to update its flood plain ordinance or planning and building codes to address increasing flood risk on the waterfront.

Creating consistent rules governing private property could be a challenge. “Regulations around climate change are in their infancy, or nonexistent,” said David Behar, climate program director for the San Francisco Public Utilities Commission.

The San Francisco Public Utilities Commission has updated its flood maps, which guide public works investments, but other agencies do not impose those guidelines on private property.

Mayor Ed Lee and the Board of Supervisors last year resisted a call from the chair of the city’s civil grand jury to stop approving new shoreline development until stricter building rules are passed. Officials said that changes to city codes might be necessary, though until now state environmental laws and reviews have been sufficient.

Official maps upon which the city’s 2008 flood ordinance is based do not account for future sea rise. Developers say this means the city lacks the legal grounds to prevent building there.

In the past five years, San Francisco land-use agencies have approved residential, entertainment, retail, medical and office projects on nearly 50 waterfront parcels that are less than 8 feet above sea level. Major projects are somewhere in the approval process for Treasure Island and in parts of South of Market, Pier 70, Candlestick Point and Hunters Point.

The most contentious is the Golden State Warriors’ $1 billion plan for a mixed-use facility in the Mission Bay neighborhood south of downtown. Opponents of the project, centered around an arena for the 2015 NBA champions, have focused on how it would affect traffic and bay views.

In a survey of 13 communities around the bay with the most intense waterfront development, the Public Press found that six had progressed beyond studying the threat of sea rise but none had an action plan. And only two — San Francisco and San Jose — had changed rules for any departments that oversee land use.

In a 2009 report for the California Energy Commission, the Pacific Institute, an Oakland-based research group advocating for corporate environmental stewardship and social equity, estimated that property lost in the event of 4.6 feet of sea rise by 2099 would cost the Bay Area $62 billion (nearly two-thirds the cost for all of California).

This inundation would require rebuilding the airports serving San Francisco and Oakland, and moving parts of interstates 101 on the Peninsula and 80 in the East Bay. It could also put 270,000 people in danger during

severe floods, the report warned, and “continued development in vulnerable areas will put additional areas at risk and raise protection costs.”

“Now is the time to look seriously at what will happen 50 or 100 years down the road,” said Gary Griggs, who directs the Institute of Marine Sciences at the University of California, Santa Cruz, and contributed to the National Research Council’s most recent report on sea level rise on the West Coast. “What is the value of making a development, housing project or mall if we know it will have to be removed later, except for some short-term temporary gains?”

Developers stand to profit handsomely from the waterfront land rush, but governments also benefit in the short run. The proposed megaprojects promise tens of millions of dollars in tax revenue. Some cities are offering developers tax credits, low-cost land and flood-control infrastructure to encourage building on their shorelines.

Acting alone, cities risk pushing floodwaters into neighboring areas. In the short term, to avoid ringing the whole bay with barriers, communities could surround themselves with small levees and extend them inland up creeks. This would keep water from neighboring communities out, until it got too high.

The common roadblocks that environmentalists face nationwide in raising concern over adaptation to climate change, such as distrust of science or lobbying by the fossil fuel industry, play only a small role in Bay Area politics. Here, the obstacles involve pressure from the real estate, construction and tech businesses emphasizing short-term economic opportunity over more precautionary environmental perspectives.

San Francisco planning staffers say they evaluate each application for its response to the threat of sea level rise and suggest a range of adaptation strategies. According to public records, in the last five years the city has approved more than 50 projects, each worth at least $1 million, in low-lying waterfront areas. The estimated development costs of these projects exceed $4.5 billion.

A report in June 2014 from San Francisco’s civil grand jury — a volunteer committee that examines local government — concluded that San Francisco was not moving nearly fast enough to protect public safety in the event of sea rise. Behar, who last year headed the city’s interagency Sea Level Rise Technical Committee, said scientists’ increasing confidence in their projections and the degree of agreement among them support taking action.

This year, Mayor Ed Lee convened a new panel, the Sea Level Rise Coordinating Committee, chaired by Gil Kelley, the director of citywide planning, and Fuad Sweiss, the city engineer. He said the group would produce a “high-level assessment” of risks and vulnerabilities, and consider recommending stricter rules for private development.

Maryta Piazza, corresponding secretary of the civil grand jury, told a Board of Supervisors committee in September 2014 that the city should impose a moratorium on private developments until its codes are updated.

“If we don’t stay ahead of the trend,” Piazza said, “as we are now we’ll be forever catching up, fixing up, and ending up spending much more money in the long run.”