

Dutch help California's Bay Area plan for sea level rise

September 22 2009, By Julia Scott

How to plan for sea level rise, a still-abstract concept for many Californians, drew serious consideration from engineers, designers and urban planners from Holland and the U.S. at a symposium held on Monday.

A group of government-sponsored Dutch experts presented a report with strategies to deal with sea level rise in the [San Francisco Bay](#) and the Sacramento-San Joaquin Delta based on a year's worth of research in partnership with the Francisco Bay Conservation and Development Commission.

With 50 percent of the Netherlands below sea level, the Dutch have been perfecting flood perfection for the last 600 years.

The inevitable effects of climate change in California, and how cities can adapt to them, are starting to get more attention from planners. While no one knows how exactly how sea level rise will play out 100 or 200 years from now, experts agree more severe and frequent floods are going to be a part of it.

Avoiding sea level rise is by now impossible. The Bay has already risen 8 inches since the start of the 20th century, and scientists in California and worldwide agree the Bay Area in particular can expect to experience sea level rise of up to 16 inches by midcentury and up to 55 inches by 2100.

Extreme storms will increase annual risk of flooding from 1 percent to

100 percent if no actions are taken to protect the Bay Area shoreline, potentially endangering 270,000 people, according to the Pacific Institute. Development along the [shoreline](#) is currently valued at \$62 billion.

How to plan for a future in which some of that real estate is threatened by storm surges -- for a time beyond what today's urban planners will live to see -- is the crucial question, said Will Travis, executive director of the Bay Conservation and Development Commission.

"We're in the same position as the captain of the Titanic. By the time he looked up it was too late -- he was going to hit (the iceberg)," said Travis. "We need to stop trying to protect the Bay Area the way it is.

Instead, we need to design it for the way it will be in the future."

That future may involve dismantling development in some places and letting the tide take its course, according to the report. Local leaders may decide that some areas, such as the Port of Oakland and both regional airports, are too valuable to lose and must be protected at all costs. Other areas could be transformed to incorporate rising tides into the heart of a city.

The key is to begin asking those questions now, especially as several major developments at the edge of the Bay await approval, including Treasure Island and a Cargill saltworks site in Redwood City, Calif. Those areas were singled out in the report as "hot spots" for the Bay, meaning they represent the types of development most at risk from sea level rise.

"Just as in an emergency room, making these policy decisions will be difficult," said Travis. "It may be better to abandon some places than to allow the houses to be built and then try to protect them from flooding."

Frustratingly little is known about how well protected the Bay Area is from a serious flood even now, according to the report (cities on the Bay are expected to prepare for a once-in-a-century flood, but the shores of the Netherlands are armored with [flood](#) gates and other equipment strong enough to withstand a once-in-10,000-year onslaught from the North Sea.)

While many of the Bay Area's most vulnerable and valuable areas are protected by federally-certified levees, they were all built before planners became aware of how [sea level rise](#) would change the whole equation.

Simply building higher levees is not a silver bullet, however. The Dutch came to that conclusion in 1995 after major flooding though the country's interior estuaries made them rethink the policy of walling off every section of river. They invented a new concept called "living with water" designed to embrace [sea level](#) rise. They raised houses and let water flow underneath them. The government bought farmland along waterways and turned it into tidal wetlands, which naturally absorb water.

"People realize we can't just raise levees forever. If something goes wrong, you have an entire city that will be flooded in an instant. Water is a fact -- we need to do something about it," said David Van Raalten, project manager for the pilot project between the Netherlands and California and a principal in ARCADIS, an international engineering and consultancy firm.

Rather than propose a series of tailor-made design solutions for each Bay Area "hot spot" based on a Dutch blueprint, the report offers a new way of thinking about what types of development ought to exist in which area. Zones with high economic value might continue to fill the Bay and expand with the help of levees and sea walls. Another option, labeled

"tidal embracing development," could involve urban tidal canals carved into the suburbs or parking lots that retain storm water underground.

The Dutch government has formed similar partnerships in most of the world's most vulnerable water regions, including Louisiana, Indonesia, the Yangzee Delta in China and the Mekong Delta in Vietnam, with the goal of sharing expertise and learning from each other.

The Dutch government spent 120,000 Euros (\$176,000) on the Bay Area pilot project and is proposing to invest another 100,000 Euros for further research in [California](#), provided the state can match the money.

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Citation: Dutch help California's Bay Area plan for sea level rise (2009, September 22) retrieved 22 June 2024 from <https://phys.org/news/2009-09-dutch-california-bay-area-sea.html>

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