Both Coasts Watch Closely as San Francisco Faces Erosion

Felicity Barringer, New York Times, 3-27-12

SAN FRANCISCO — The explosive waves of Ocean Beach, a 3.5-mile stretch separating the city from the gray edge of the Pacific Ocean, have long been a draw for tourists, local families and an international tribe of surfers.

But every few years, stormy surf driven by the weather pattern known as El Niño grinds away at a thinning section of beach, pulling sand out to sea. Some comes back, but two years ago, bluffs collapsed and massive amounts of sand disappeared for good.

Holding back the sea here seems as impossible as holding back the fog. But planners see Ocean Beach as a top priority in a long roster of Bay Area sites threatened by inundation because of what lies on its landward side: the Great Highway, a $220 million wastewater treatment plant and a 14-foot-wide underground pipe that keeps sewage-tainted storm water away from the ocean.

The question facing at least eight local, state and federal agencies boils down to this: With California officials expecting climate change to raise sea levels here by 14 inches by 2050, should herculean efforts be made to preserve the beach, the pipe and the plant, or should the community simply bow to nature?

“We are in some ways the tip of the spear for this issue,” said Benjamin Grant, a city planner who is leading a study of the problem for the nonprofit San Francisco Planning and Urban Research Association, or SPUR.

Mr. Grant describes the beach’s south end as “an erosion hot spot.” But, he said, all coastal communities will have to grapple with rising seas.

A disruptive rate of sea-level rise is one of the most daunting potential consequences of climate change. Recently, researchers warned in two new studies that severe coastal flooding could occur regularly in the United States by the middle of the century and that California would be among the states most affected. Previous studies have suggested that the rise in sea levels is poised to accelerate globally, although the evidence that this is happening is not yet definitive.

“Communities will be forced to respond in one way or another to the increased erosion and coastal storm damage,” economists at San Francisco State University concluded in a recent study. Communities can either plan for the long term or improvise, storm by storm, until ad hoc solutions are inadequate, they warned.

Officials in cities across the United States and Canada are staying in close touch with San Francisco planners. “People often wait to see what California does” about environmental hazards, said Gary B. Griggs, a professor of earth and planetary sciences at the University of California, Santa Cruz. “So we have a chance to have a big impact.”

Locally, hundreds of millions of dollars ride on the Ocean Beach decision. The San Francisco State study projects that sea-level rise there could impose costs of more than $650 million by 2100 if nothing is done. The big-ticket items are the components of the Oceanside Water Pollution Control Plant and related structures, which were completed in 1993 to meet Environmental Protection Agency demands for cleaner wastewater.

Erosion, of course, is a perennial issue for beachfront communities, and Ocean Beach, artificially expanded more than a century ago, has always been vulnerable. But as the planet warms, the problem is expected to

become far more severe all along the northern Pacific Coast. Sand bluffs in the Bay Area, which for decades have eroded by an average of more than a foot a year, are expected to collapse at an ever-faster clip.

The options are to keep installing hard structures in front of vulnerable areas, replenish the sand or simply retreat and let the shoreline move where it will.

Each has a cost. Building walls or piling up riprap protects infrastructure. But it amplifies wave action as water ricochets off the hard surface with enough energy in its retreat to scour the sand. The scouring hastens the disappearance of bluffs and beach.

“The pros of riprap are that it can be long term,” said John R. Dingler, an oceanographer with the Army Corps of Engineers. The cons, he said, are that “there will be no beach at high tide.”

The armoring of the coastline interferes with beachgoers, infuriates environmentalists and surfers and disturbs vegetation and bird habitats. But after destructive storms, it has been San Francisco’s solution of choice in recent years, with city bulldozers dumping thousands of tons of rock and chunks of concrete, granite and brick sidewalks into new breaches.

Two years ago, after fierce storms tore at the underpinnings of the Great Highway, the city created a revetment, or free-form wall, out of 12,000 tons of boulders. Yet last summer, the California Coastal Commission denied the city permission to install more armor and refused to issue retroactive permits for two existing structures. The city sued; the case is pending.

Mark Massara, a local lawyer and an avid surfer who has spent two decades lobbying and litigating over coastal disputes, is fiercely critical of the piles of stone. “No one is willing to move or adapt — they think we can armor everything,” he said. “Guess what? Not everything can be defended.”

Environmentalists tend to prefer the second solution: replenishing the shore with some of the tons of sand regularly dredged by the Army Corps of Engineers to ensure that the waters are deep enough for cargo ships rumbling away from the Golden Gate Bridge. With enough sand, dunes could be rebuilt to mimic those that once covered the area, they say; areas on or near the beach are critical to the survival of species like the bank swallow, which nests in burrows inside sandy bluffs on the beach’s southern edge and is listed as threatened in California.

The corps is considering an infusion of sand that could cost $10 million. It would last perhaps three or four years, Mr. Dingler estimated. “Our economists said, given the value of the infrastructure, it’s a worthwhile endeavor to try it once and see what really happens,” he said. Still, one bad El Niño storm could undo everything, he added.

After severe storms in early 2010, repair work left the southern section of the Great Highway closed for much of the year.

The draft plan prepared by SPUR calls for reducing the northern part of the highway to two lanes from four, closing the southern section, and rerouting traffic inland, at an estimated cost of $30 million.

That “enables us to do significant retreat — removing the road and taking advantage of that space,” said Mr. Grant, the planner. (The idea has not been welcomed by all the commuters or neighborhoods involved.)

The overflow pipe would no longer be protected by the Great Highway; instead, workers would build a low wall scarcely higher than the pipe itself, topped by a cobblestone berm that would slope down toward the surf. (Estimated cost: $60 million.) New sand dunes would protect the waste treatment complex itself.

When SPUR's final draft is ready next month, all of the agencies involved must agree on the plan. Michael Carlin, the chief operating officer of the San Francisco Public Utilities Commission, said that each agency receives constant updates and that they "are all being brought along."

When the proposed solution is ready, he said, "I believe there will be buy-in from all."

Mr. Grant predicted that far more coastal communities would face hard choices like these before long. "Especially around beaches," he said, "because they are so dynamic and they are so beloved."