Council Meeting
9/25/2012
Betty Moose
Item # 6

CLIMATE

California sea levels at risk for large rise

6-23-12

Study: State's geology, sinking coast a factor in dramatic increase

By Paul Rogers
progers@mercurynews.com

As the world continues to warm from climate change, most of California — including San Francisco Bay — will see a greater rise in sea level than other parts of the planet, according to a prominent national study released Friday.

ONLINE EXTRA
To view a map of sea level rise's effects in California, go to www.mercurynews.com/extra

The report, from the National Academy of Sciences, found that the impacts of melting ice and warming, expanding oceans will hit California harder because most of the state's coastline is

See WATER, Page 5

Water

Continued from Page 1

slowly sinking due to geological forces.

Ocean levels south of Humboldt County will rise up to 1 foot in the next 20 years, 2 feet by 2050 and up to 5 feet by 2100, the study showed.

San Francisco Bay already has risen about 7 inches in the past 100 years, as measured by the tidal gauge at Fort Point, under the Golden Gate Bridge.

"We shouldn't be debating this any more," said Gary Griggs, a coastal geologist at UC Santa Cruz who served on the committee that issued the 274-page report. "Let's start thinking realistically about the future and plan so we minimize our losses."

At risk over the next generation: low-lying areas such as San Francisco and Oakland airports, Treasure Island, Alviso in San Jose and low-lying communities such as Foster City and Redwood Shores, particularly during winter storms at high tide.

The estimates in Friday's report were largely in line with other estimates from scientists in recent years at the U.S. Geological Survey, the United Nations Intergovernmental Panel on Climate Change and other research bodies.

But Friday's report was the most high-profile study yet to conclude that California faces unique challenges because of its geology, largely the slow movement of tectonic plates that generate earthquakes and have shaped much of the state's landscape over millennia.

As the world warmed over the 20th century, oceans rose at a rate of 1.7 millimeters a year, or about 7 inches over the century. But since 1993, they have been rising at a faster rate, 3.1 millimeters a year, or 12 inches a century.

Most of the world's climate scientists, coastal geologists and oceanographers see that rate increasing in the decades ahead.

The report concluded that on average across the globe, oceans will rise up to 8 inches in the next 20 years, 19 inches by 2050, and up to 4 feet by 2100, causing increasing threats of flooding.

"There's no indication greenhouses gases are diminishing," Griggs said. "Things aren't turning around. Most politicians are in office for a few years, and these are multidecade problems."

The slow but steady ocean rise won't cause immediate disasters, Griggs said. But during large winter storms and high tides, they increase the risk of flooding in low-lying areas, such as the 1983 El Niño winter, when Alviso flooded under 6 feet of water.

Already around Northern California, increasing rates of coastal erosion and sea level rise are posing challenges. Preservationists abandoned plans to try to save Stillwell Hall, an officers club at risk of falling into the ocean in the Fort Ord area in Monterey County. Apartments and homes have been abandoned or have fallen into the sea in Pacifica, Capitola and other communities in the past 20 years. San Francisco is deciding whether to armor Ocean Beach to stop rising waves from threatening the adjacent highway and a wastewater plant.

Already, the coast erodes at a rate of 6 inches a year or more in many parts of California, due to sandstone and other soft rocks being battered by waves. That will increase not only on cliffs but on beaches, sand dunes and other coastal features, researchers said Friday.

"As the sea level gets higher, we would expect the retreat of dunes and rates of erosion to increase," said Robert Dalrymple, chairman of the committee that issued the report, and a professor of civil engineering at Johns Hopkins University.

California officials welcomed the report.

"Our coast and ocean largely define California. Because of that, we must be keenly aware of and plan for sea level rise," said California Secretary for Natural Resources John Laird, who added that the study "will help policymakers and planners prepare for the next century."

Last year, the Bay Conservation and Development Commission, a state agency, passed the first regulations to require developers to consider sea level rise on projects along San Francisco Bay's shoreline.

Some areas, like the San Francisco and Oakland airports, will be protected with levees. In other places over the coming decades, buildings may have to be moved or torn down, experts say.

Friday's report noted that Oregon and Washington will see less rising than California because their plate system is a subduction zone, where the Juan de Fuca Plate is pushing under the North American Plate, slowly raising the land.

The report also looked at future projections as ranges, which will depend on how much more carbon dioxide humans emit, how fast countries expand renewable energy and other variables, such as how fast large sections of Greenland or Antarctica melt.

For California, the sea level rise ranged from 2 inches to 12 inches by 2030, from 5 inches to 24 inches by 2050, and from 16 inches to 67 inches by 2100.

Environmentalists said the study showed the need for faster action.

"Today's warning, coming from our country's leading scientific advisers, sends an urgent message to our president and other policymakers: We need strong action right now to avert climate catastrophe," said Shaye Wolf, climate science director at the Center for Biological Diversity.

Carbon dioxide from the burning of fossil fuels traps the sun's heat, warming the earth. Concentrations of carbon dioxide — from coal, gasoline and other fuels — have increased steadily in the past 125 years, up 37 percent since 1880.

Nine of the 10 warmest years in modern history, back to 1880, when modern meteorological methods were developed, have occurred since the year 2000, according to NASA. The 10th was in 1998.

Even with a cooling effect last year from La Niña conditions, the average global surface temperature in 2011 was the ninth-highest since 1880, according to NASA scientists.

LAURA A. ODA/STAFF

A lone seagull floats in a pond on the southern end of Oakland International Airport. The airport and other low-lying areas are at risk of sinking over the next generation, a new study suggests.

LEVELS RISING:

- 2-12 inches by 2030
- 5-24 inches by 2050
- 16-67 inches by 2100