

Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Distinguished Professor of Earth and Planetary Sciences, UC Santa Cruz.

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The Costs of Providing Fresh Water

Any new source of water today, no matter what or where it is, is going to be expensive. During the long recent drought, many Californians were asking why don't we just build more dams? Seems like a simple solution, although for a dam to store a lot of water, we also need a lot of precipitation and runoff, which is not always guaranteed these days.

California is going to spend about a billion dollars of 2014 Proposition 1 bond money to provide partial funding for two major dam projects in the greater San Francisco Bay area. This, however, will only cover about half the total costs of these two big projects, one in southern Santa Clara County and one in Contra Costa County.

The applicants for these projects must still come up with the other one billion dollars from rate increases, federal grants or other sources. They must also go through the long process of purchasing the necessary land, obtaining water rights and construction permits, and completing all of the environmental impacts assessments. These are not trivial issues or ones that are quickly resolved.

Closer to home, the PureWater Soquel Project, which is a plan to inject highly purified waste water into the aquifer (the Purisima Formation) that provides the water for the Soquel Creek County Water District, now has a Draft Environmental Impact Report that will be the subject of three upcoming public study sessions. The estimated cost of this plan is \$183 million.

The Santa Cruz City Water Department is ready to embark on a large reservoir and dam improvement project on the Newell Creek Dam (which impounds Loch Lomond, our only large water storage facility). The plan will include a number of upgrades, including: 1) replacement of the outlet pipe and spillway bridge; 2) designing a road and culvert system allowing dam access during flood conditions; 3) dredging the bottom of the 2.8 billion gallon reservoir to increase storage; 4) a

new structure on the dam for controls; and 5) a new 10-foot diameter tunnel under the dam. Estimated cost for these improvements is \$50 million.

These are just the beginning, however, of a set of needed Santa Cruz water-system improvement projects planned over the next ten years and estimated to cost \$300 million. There is no more cheap water and even our existing water systems need to be repaired and upgraded from time to time, which is expensive.

Several years ago the City Water Department replaced the old Bay Street Reservoir with two large concrete storage tanks, which store about a day and a half of processed water (12 million gallons) at a cost of \$25.6 million.

The Santa Cruz Water Department has the responsibility for providing clean safe water for all of its 96,000 customers and also for planning ahead for future needs. About 15 years ago, in the wake of earlier droughts and water rationing, the Water Department initiated an evaluation of a joint desalination project with the Soquel Creek County Water District.

The proposal was for a facility that would provide about two million gallons a day of fresh water from the offshore ocean with costs and water to be split between the two districts. The districts are quite different, with Santa Cruz obtaining over 95% of its water from surface runoff and Soquel Creek obtaining virtually all of their water from beneath the ground.

The partnership was planned so that Santa Cruz could use this new water to augment their water supply during the drier summer and fall months when runoff was low and Loch Lomond Reservoir storage was reduced. Soquel Creek could use the water during the winter and spring months to recharge their aquifer.

The evaluation process involved a small pilot reverse osmosis plant that was constructed and operated for about a year in 2008 at the University's Long Marine Laboratory. An existing pipeline provided seawater, and various filters and membranes were tested to make sure that the system could operate effectively with local seawater. This was successful and indicated there were no source water problems.

The exploration process also involved engineering studies, evaluation of potential locations for intake and outfall pipes as well as the site of the proposed plant itself, in addition to cost analysis and also energy usage. The price tag at the time for the

proposed facility that would provide two million gallons of water daily was \$125 million.

After ten years of planning and evaluation, and in the face of local opposition based primarily on fears of environmental impacts and costs, the Santa Cruz City Council voted in 2013 to suspend work on the proposed facility indefinitely and appointed a 14-member Water Supply Advisory Committee (WSAC) to investigate all water supply options.