

**Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.**

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**Shifting Sand and Eroding Bluffs**



El Nino and eroding bluffs and shifting sands.

This has been an active winter for coastal change along our bluffs and beaches. Readers have been sending me photographs or letting me know when they see something exciting happening. Many of you have seen the failing cliffs at Pacifica on the news. Several friends notified me that the sea stack at the base of the stairs at the end of Almar Avenue had collapsed. In 1987 it was part of an arch connected to the cliff.

There has also been a lot of sand moving around this winter, very visible at the mouth of the harbor, where the dredge has been busy, boaters frustrated, but surfers delighted. This past week a long-time local resident emailed that while walking on Seabright Beach she saw something she had never witnessed in 40 years of beach walking- the San Lorenzo River was flowing through the cave beneath San Lorenzo Point and onto Seabright Beach. Sand levels had dropped dramatically.

The combination of very high tides, elevated El Niño sea levels, and lots of large storm waves throughout much of January and early February, produced ideal conditions for moving sand.

Sand levels on most beaches have been six to eight feet below their summer levels, as large waves have temporarily moved that sand offshore. An interesting phenomenon, pictured in Tuesday's paper, is the new beach extending into the cove above Cowells and then continuing along the base of the bluff below West Cliff Drive.

This beach appears every 3-5 years or so, quickly becomes a favorite spot for locals, and usually only happens in El Niño years. Waves coming from a more southwesterly direction, rather than from the northwest, are pushing the sand from Main and Cowells beaches upcoast into the cove. This special beach is almost always gone by late spring and doesn't persist into the summer months.

Another friend who goes to Davenport Landing Beach regularly has noticed striking changes in both the level of the sand, and also how quickly sand can shift back and forth from one end of the beach to the other.

There's essentially one thing responsible for all of these changes- the bluff erosion and sand transport- waves, and their size and direction of approach. Big winter waves can transport massive amounts of sand. The Santa Cruz harbor master and dredge operators have been well aware of this for 50 years. From dredging records we know that waves move about 250,000 cubic yards of sand along Seabright Beach and into the channel entrance in a typical year.

That's a lot of sand, but hard to visualize. Think about it as 25,000 dump trucks, each carrying 10 cubic yards of beach sand. That line of dump trucks, bumper to bumper, would extend about 118 miles along the shoreline, from the Golden Gate Bridge south to the Salinas River mouth. And it's all being moved by waves, not dump trucks.

Now I have a sand transport problem for you to figure out. Fifty-six years ago, a couple from Sequoia High School in Redwood City was visiting the Santa Cruz Beach Boardwalk. The young lad, Garrett, had given his girlfriend, Sandy, his senior class ring. While playing in the waves, the ring slipped off her finger and was lost in the sand.

Sandy and Garrett got married in 1960, moved to Santa Cruz, and had long ago forgotten about the missing class ring. In 2002, forty-four years later, a beachcomber with a metal detector found a ring in front of the Boardwalk. It was from Sequoia High School and had both the graduation year and Garrett's initials engraved on the ring. The beachcomber contacted the high school, they searched their records and located Garrett and Sandy in Santa Cruz and returned the ring, like new, 44 years after they lost it in the surf.

During those intervening years, waves has transported about 11 million cubic yards of sand past the Boardwalk. Winter waves have scoured the beach, summer waves have brought the sand back on shore, year after year. How in the heck did that ring remain there all those years?