Our Ocean Backyard

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Did you ever stop and ask yourself, where does all of the sand on our Santa Cruz beaches come from? If you haven’t, think about it for a minute now…where do you think it comes from?

What we do know from the dredging of the Santa Cruz Harbor is that ever since it was constructed in the early 1960s, we have had to dredge sand out of the entrance channel – sand that has moved south or downcoast from Main and Seabright beaches. Over the past 20 years, the volume removed annually has averaged about 250,000 cubic yards. This would fill about 25,000 dump trucks and would be a line of trucks 118 miles long, bumper-to-bumper, extending from the Golden Gate to Monterey. That’s a lot of sand that’s in near constant motion, coming from somewhere and ending up somewhere else. And this goes on year after year.

While the beach looks pretty stable and permanent during the summer months, the sand is actually in nearly constant motion, up and down the beach face as waves and tides change, and alongshore as well. During the winter months, waves are more energetic, usually steeper and larger, and they tend to move the beach sand offshore, leaving the beaches narrower and lower.

With the return to the less energetic and longer period late spring and summer waves, that sand moves back onto the beach face. During particularly stormy winters, the beach can be cut back over a hundred feet in width and can be 5-10 feet lower. Although this may come as a surprise to new residents, this is usual and expected.

In addition to this seasonal onshore-offshore motion, sand along most beaches also moves alongshore, or in Santa Cruz, from north to south. This is the case along much, but not all of the California coast, and is driven by the dominant waves from the northwest. This transport is known as littoral drift and can be best approximated at different places along the state’s shoreline by averaging dredging rates at locations where harbors trap that sand. Littoral drift rates can vary from as low as 30,000 cubic yards per year, to as high as 1,000,000 cubic yards.

So here is a mystery to solve, keeping in mind that the beaches can be eroded back as far as 100 feet or more every winter, reduced in height by 5-10 feet, and about 25,000 dump truck loads of sand move along Main Beach every years on average. This sand then moves onto Seabright Beach, into the harbor entrance, and then gets dredged out and placed onto Twin Lakes Beach to continue it’s downcoast journey.

In 1958, a couple met at Sequoia High School in Redwood City. Garrett Roslow bought a class ring with his graduation year and his initials inscribed on the inside. He began dating Sandy Lowrey in 1959 and had given her his class ring, which was a little too large. While visiting the Santa Cruz Beach Boardwalk in 1959 she lost it in the waves. They were married in 1960, moved to Scotts Valley and then later to the Santa Cruz Eastside, and had long ago forgotten about the lost ring.

In 2002, forty-four years later, a beachcomber with a metal detector found a ring in front of the Boardwalk. He notified Sequoia High School, and the alumni office notified Garret telling him that they had a ring with his initials and the year of his graduation. Sandy and Garret retrieved the ring, polished it and it was like new, 44 years later. So how, with something in the neighborhood of 10,000,000 cubic yard of sand having been transported along the Boardwalk Beach and many winters with severe beach erosion, how could that class ring from 1959 still be there in the sand along the shoreline? And, to be honest, I don’t know the answer.

The other question I posed at the beginning of this column was where does our beach sand come from? For the state as a whole, about 75-95% of the sand on our beaches comes from rivers and streams, mostly during winter months of high discharge. When the sediment-laden winter flows reach the shoreline, the finer-grained silt and clay is carried offshore while the sand settles on the beach. The remainder of our beach sand comes from cliff, bluff and dune erosion, which can be more or less important depending upon how fast the bluffs or cliffs are eroding and how much beach size sand is contained in the bluff materials.