

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

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Moving Sand Around**



A 1956 aerial photograph of Main and Seabright Beaches showing the San Lorenzo River heading straight out to sea and a narrow Seabright Beach as there was no harbor and no jetties to trap sand and widen the beach.



2005 photograph showing a very wide Seabright Beach and a wide sandbar causing the San Lorenzo River to flow upcoast along the back beach.

Watching the huge waves breaking along the coast last Sunday was a clear reminder to all of us of the power of the ocean. Those people who were rescued from the surf have perhaps an even greater respect for the sea.

Bulldozers spent two weeks or so in mid-March moving sand around on Main Beach in an effort to protect the seawall fronting the Boardwalk by redirecting the San Lorenzo River back to its normal route alongside San Lorenzo Point. Historically, the river mouth has maintained a course directly to the ocean.

However, when the shoreline here was altered in the early 1960s by the construction of the jetties at the Santa Cruz Harbor, this stretch of shoreline began to slowly transform.

Prior to harbor construction, Seabright or Castle Beach had always been quite narrow. In the old days, waves reached the base of the bluff each winter, and the sandstone bluffs were actively eroding. A walk along East Cliff Drive today above Seabright Beach between 1st and 4th Avenues still reveals isolated remnants of the old concrete roadway perched thirty feet above the beach like pedestals.

In 1963, as soon as the west jetty was completed, Seabright Beach began to widen. It continued to widen for the next twenty years or so, as littoral drift from upcoast was trapped against the jetty. Where waves previously crashed against the base of the bluff, a sandy beach 200 to 400 feet wide formed, offering year round protection except during periods of high tides and very large waves. It also provided an inviting wide new beach for residents and summer visitors.

As Seabright Beach continued its expansion further seaward, it eventually extended out as far as the end of San Lorenzo Point, and beyond in recent years. The damming effect of the jetty gradually began to impact Main Beach as well. Sand backed up on the beach and widened it. Aerial photographs taken during the summer months over the past 25 years often show a wider sand bar forming at the mouth of the river.

Many of the streams along California's central coast have very low summer flows and are typically dammed by sand bars during the summer and fall months. The Salinas, Pajaro and San Lorenzo rivers often experience this phenomenon, as do Aptos and Soquel creeks. These backed up streams form ponds or lakes, which provide warm water for kids to play in, a site ripe for contamination, but also apparently a habitat in places for young fish.

As the level of the pond at the San Lorenzo River mouth increased in elevation over time, there was also an increased risk of natural breaching at a low tide. This could result in the rapid, high velocity and very hazardous draining of all the dammed up water as it flowed into the ocean. So for many years, the sand bar that formed at the mouth of the San Lorenzo was artificially breached as a safety precaution.

In the 1980s, however, the California Department of Fish and Game made a decision to eliminate all artificial breaching of the river mouth based on the

importance of the pond for fish habitat. The regular breaching was terminated and sadly, there was a tragic accident at the river mouth the next year from an uncontrolled breach. A young woman wading across the river was swept offshore in the fast moving flow.

At about this same time, the sand bar and beach at the river mouth were gradually getting wider as sand backed up by the harbor jetty continued to extend further to the west. The overall effect of this additional sand accumulation, when combined with the typical low flow of the San Lorenzo in years with low rainfall, has been a wider dam across the mouth of the river.

In response, the river in recent years has often taken a different course, flowing west along Main Beach where the sand is often at a lower elevation than the crest of the sand bar. This has led to a broad pond on the beach in front of the Boardwalk at times. The entire flow of the river this year went west, along the base of the retaining wall that protects and supports the Boardwalk.

Concern with continued erosion and potential undermining of the wall led to an emergency plan to use bulldozers and a crane to cut open a channel through the sand bar and allow the river to follow its historic course. Rerouting the river also included moving sand from the excavated channel along San Lorenzo Point and from the beach, to build a levee to redirect the river.

The levee was completed on the evening of March 19, with the river redirected along its historic route directly to the sea. This left a large pond on the back beach directly in front of the Boardwalk. But with the very large waves of this past weekend, all of that sand moved by the dozers to build the levee to channel the river was all redistributed and smoothed out with a few days of typical winter wave action. There is no trace of the levee left today.

Waves along our shoreline here typically transport about 250,000 cubic yards of sand down coast each year on average. This is equivalent to 25,000 dump truck loads annually, or 68 truck loads every day. It's a very efficient mechanism for transporting sand, as long as it's going where you want it to go.