

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

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Walking on Rocks



A coarse-grained Turkish beach along the Aegean Sea.



A Turkish gravel beach.

As you are reading this, Sandy Lydon and I and an intrepid group of 40 other hikers are somewhere on Day 2 of our 5th Monterey Bay Walk. Today, we are heading from Zmudowski State Beach, just south of the Pajaro River mouth, about 9-10 miles downcoast ending the day at Marina State Beach.

It's a wilder stretch of shoreline than Day 1, which took us a long 12 miles from New Brighton State Beach, past Seacliff Beach, Rio del Mar, Manresa, Sand Dollar, Sunset and Palm beaches and finally across the Pajaro River, now dammed

by a sand bar, and down to Zmudowski. Lots of back beach home development, but also state beaches, sun bathers, walkers, joggers, fishermen, and a few surfers.

But, the thing I think we all take for granted that makes this long walk possible, the walk to remember for some, is that we have a 31-mile long ribbon of sand extending along the entire bay shoreline. While the beach from New Brighton to Monterey ebbs and flows with the seasons, eroding back in winter and accreting in the summer, there is always sand to walk on. In fact, there are only two places where it is usually impossible to walk along the dry sand, sometimes four.

You can't walk across the entrance to Moss Landing Harbor, so a detour across the highway bridge is necessary. At the southern end of the bay as a result of concrete and debris dumped over the bluff at Sand City for years, there is now a pile of concrete extending out into the water. It's a difficult place to walk around, so we climb over it.

Depending upon the time of year and river flow, you may be able to walk across the sand bars at the mouths of both the Salinas and Pajaro rivers, but then again you may not. This year our group is able to walk across both as river's flow is dammed by sand.

A beach 31 miles long requires a lot of sand from somewhere. In round numbers, the shoreline from New Brighton to the Monterey breakwater contains about 20 million cubic yards of sand; that's about two million dump truck loads. And that's not counting all of the sand that has been blown up into the dunes along the central and southern part of the bay, stretching from Pajaro Dunes to Del Monte Beach, or that that underlies all of the Fort Ord and Sand City areas.

So where did it all come from? Mostly it's come from the rivers and creeks between Half Moon Bay and the Salinas River. Their watersheds are underlain by granite, sandstone, siltstone and shale and a variety of other rocks, but if you look at the beds of most of the streams as they head into the ocean, they are transporting sand- nice clean beach sand.

Most of it is carried by the large river flows of winter, and in fact, one winter with a lot of rain can bring more sand to the beaches than five or ten years of low flow. Except where we have built dams.

We just returned from three weeks in Turkey. An interesting place to travel, especially right now. We did spend time along the Aegean coast and generally, the

water is clear and clean, but there are very few, nice soft sandy beaches. We didn't find a Monterey Bay shoreline.

Most of the beaches are gravel or cobbles, smooth and rounded, but very coarse. Not the sort of beach you would jog or play volleyball on, but beautiful beaches. The people don't seem to mind, and once you have hobbled across the beach and into the water, you scarcely notice.

You might ask why? But even if you don't I'm going to explain why. Most of southern Turkey is pretty arid, not a lot of rainfall, and not many large rivers carrying sand to the shoreline.

The coastline of southern Turkey also consists dominantly of marble and limestone, great for building those ancient Roman cities, the ruins of which are scattered across the landscape, but not so great for producing sand.

Marble and limestone consist of calcium carbonate, made of ancient plankton with calcareous skeletons, or coral in some cases. But when these rocks are eroded, by weathering or from wave attack of the cliffs, they break down into small pieces of limestone and marble, which eventually dissolve. They just don't stick around as sand size grains. So the water is clear but the beaches take some tough feet.