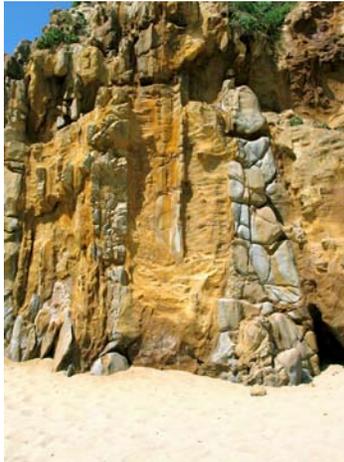


Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.

**#140 September 7, 2013
Yellow Bank Beach**



Two different generations and colors of sandstone intrusions, gold and grey.



Yellow Bank Beach from offshore showing the gold colored sand in the cliffs and across Highway one (from California Coastal Records Project)

My last column probably left thousands of readers hanging at Panther Beach, eagerly awaiting the next episode of adventure along the North Coast. Although known today by most visitors as Panther Beach, historically it was known as Yellow Bank Beach, which begs the question, why Yellow Bank?

The Yellow Bank Dairy along the North Coast is mentioned in the old records of Santa Cruz County from 1887 as one of a number of coastal dairy farms, which started at the Natural Bridges Dairy and extended as far as present day Davenport.

Seven miles north of the Santa Cruz City limits, you cross what today is called Yellow Bank Creek. On the old maps it's called Respini Creek, after Jeremiah Respini, a farmer from Switzerland. He ran a dairy in the small valley near the mouth of the creek, named -you guessed it- the Yellow Bank Dairy.

From Highway 1 you can look down as you cross the highway embankment into that little narrow valley and see an outcrop of yellow or golden colored rock on the south side. The exposure is actually part of the cut that was made for the Old Coast Road before the valleys were all bridged with fill for today's Highway 1. And while you can't see the beach on the opposite side of the highway because of the railroad embankment, the vertical cliffs there consist of this same gold colored rock; only the exposures are much larger.

The bedrock exposed in the seacliffs from West Cliff to Waddell Bluffs, and in the road cuts along Highway 1, is the Santa Cruz Mudstone. It's a tan colored, and not particularly exciting geologic formation, devoid of most fossils, which was deposited in an ancient sea that covered this area some 5 to 10 million years ago.

The yellow or gold colored rock is actually sandstone, and it was intruded or injected into the mudstone like soft toothpaste from an underlying formation millions of years ago. A mining geologist, John Newsom, who had come west from Indiana in 1901 to study geology at Stanford University, first recognized the unique nature of these sedimentary intrusions along the coast between 1901 and 1902 as he was mapping the geology of the area.

These features that gave Yellow Bank Creek, Dairy and Beach their names, at least until the panther was seen on the cliff face, are believed to be the largest exposed sedimentary intrusions anywhere in the world. Not many places can claim that. While some intrusions are a gold color due to oxidized iron, there are others exposed in the seacliffs that are a blue-grey color.

Looking up Majors Creek canyon, two miles to the south, you can see massive, near vertical cliffs that form the edges of the canyon and which consist of massive, black, asphaltic sandstone intrusions. Similar but smaller intrusions cut through the mudstone of the seacliffs and road cuts from Wilder Ranch to Greyhound Rock.

These sand bodies are called sills when they are more or less horizontal and dikes where they are vertical. Igneous dikes and sills are very common in the geologic record and were formed when hot magma under pressure was intruded into the overlying rocks. It was this process that concentrated gold in the veins of the Sierra Nevada.

Sedimentary intrusions, however, are much less common and require a special set of conditions. We need a deposit of loose clean sand that is saturated with a fluid, usually water or oil. Then, due to either a large earthquake, or the pressure of hundreds or thousands of feet of overlying material, the sand can liquefy, essentially converting it to a fluid, like quicksand.

The pressure can squeeze this now liquefied sand upward through cracks or weak zones into the overlying rocks where it gradually solidifies. Think about jumping on a huge tube of toothpaste the size of an Olympic swimming pool. And that is how we created the sandstone intrusions that gave Yellow Bank Beach its name.