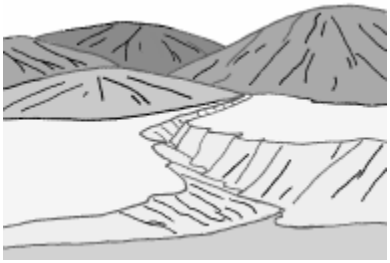
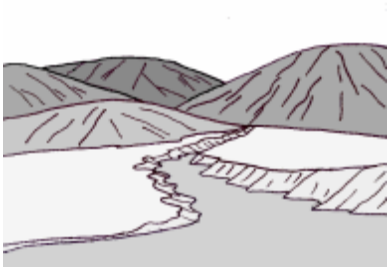
BATIQUITOS LAGOON FOUNDATION

G E O L O G Y

Formation of the Lagoon



About one million years ago, in the Pleistocene Epoch of the Cenozoic Era, the Batiquitos area was a flat, grassy plain. A stream was meandering across it on its way to the ocean. Its mouth was many hundreds of feet farther west than at present, because sea level was much lower all over the world. There had been major climate changes. North America was in the grip of the Ice Ages, although there were no glaciers in Southern California. Ice sheets were sculpting the lands in the north, and valley glaciers were carving the mountains of the Sierras. The ice sheets had trapped the precipitation formed from water evaporated from the oceans, thereby lowering sea level. At the coastline, the waves, much farther out than present shorelines, were cutting new terraces, which became covered by beach sands and shells, just like the beach today.



The land bounced upwards frequently because of movement along the San Andreas and other faults, raising old beaches high above sea level. Today, the old beaches lie abandoned above the present beach. We can see them from the trail along the lagoon. They are the flat tops of the surrounding hills, and look like gigantic steps down to the present beach. They can be seen many miles inland: the “Mesas” of San Diego are actually old beach terraces. They have a reddish sediment deposited on them, called the Lindavista Formation. The red color is an iron oxide (rust). This means the sediment was deposited in very shallow water where oxygen was plentiful, and the iron in some of the minerals in the sediment could combine with oxygen, making rust. (Iron does not rust in deep water, because little free oxygen is available.)

Whenever the land rose, the streams flowing across the plain cut down and made deep, large valleys *(see first drawing)*. This happened at our lagoon. Then, as climate warmed, ice sheets melted and sea level rose, flooding the valley into an estuary or lagoon *(see second and third drawings)*, and causing the deposition of soft sediments, which would be eroded easily when sea level dropped again. These make up the Bay Point formation of Pleistocene age.

Because we are so close to a plate boundary, sections of the land continue to move sideways or up and down along faults. An up-down fault cuts through the lower sedimentary rock in the road-cut on La Costa Avenue near the freeway, possibly extending northeast across the lagoon through the hill on the other side. This fault does not displace the sediments lying over it, which are more than 11,000 years old, so it is, therefore, not an active fault.

The rest of the story is in the present. Batiquitos Lagoon exists today because the ice sheets of the last ice age melted and sea level rose, flooding the deep valley. The creek entering the lagoon drops its sediment when it reaches still water (tides don't count in this process), and the lagoon silts up. Our lagoon would have disappeared with this natural process, had it not been rescued by dredging so that it can once again be a flushing tidal lagoon. New sediments are always being deposited. And, by the way, we are only in a warm interglacial period. If global warming doesn't stop it, a new ice age could once again lower sea levels around the world. Because we are on a slice of the Pacific Plate and will continue to move, earthquakes will continue to shake and possibly raise the land again. So this is not the end of the story!

Thanks to Jim Karnik Production for graphics (redrawn)

SOURCES:

Abbott, Patrick. 1999. The Rise and Fall of San Diego. Sunbelt Publications.

Bergen, et al. 1997. Geology of San Diego County. Sunbelt Publications.