



CNM Geology Guide

How Point Loma Was Formed & Geologic Features

Step 1~76 Million Years Ago

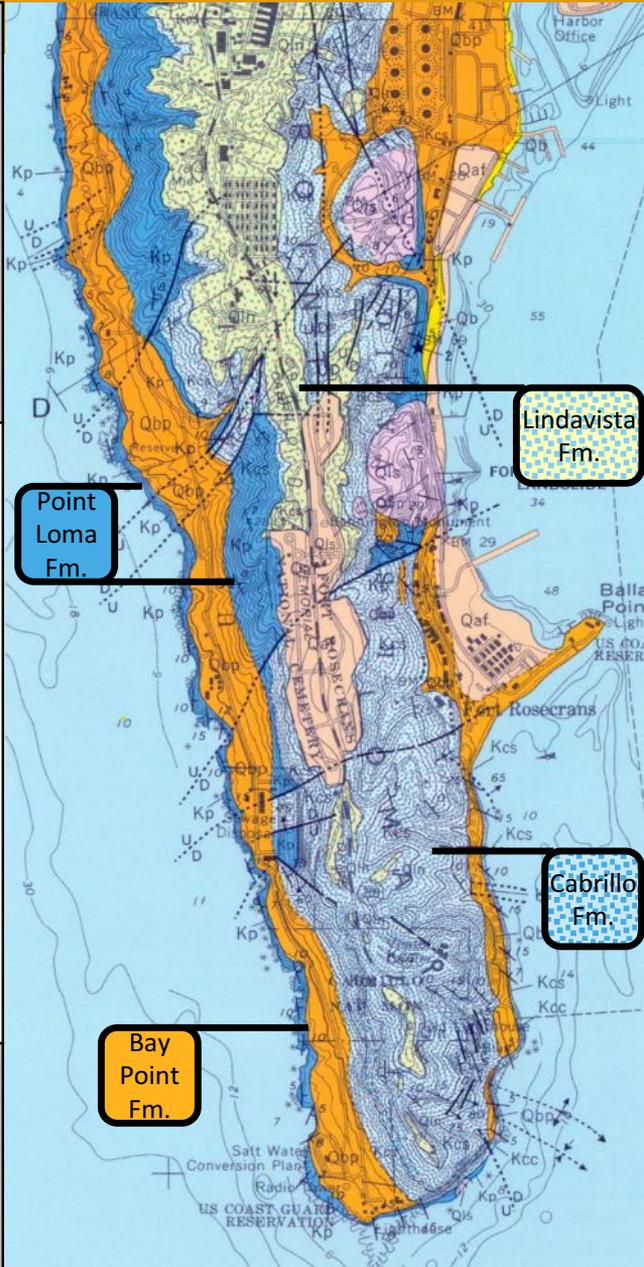
An underwater current created fan-shaped deposits of sand, mud, and gravel on the ocean floor. For millions of years these deposits, called **alluvial fans**, compacted and layered one on top of another. These layers are the ground you are walking on today!

Step 2~2 Million Years Ago

The Earth's crust is made of plates fractured with fault lines. These faults move (**plate tectonics**) and cause geologic events such as earthquakes. Plates sometimes bunch up against each other which can create new formations. Bunching in this region of San Diego forced the bottom of the ocean upwards and above the surface, exposing the sediment from the alluvial fan. This movement created the Point Loma Peninsula.

Step 3~Current Day

Forces are still at work on the peninsula! Waves carve the sandstone shore and erode the cliffs, and water moves sand toward the beach. Wind forms dunes and beach ridges on the top of sea cliffs. Plate tectonics are still forcing the peninsula to rise about 5 inches every 1,000 years!



Point Loma Fm.

Lindavista Fm.

Cabrillo Fm.

Bay Point Fm.

The Point Loma peninsula consists of four major formations that were created in different ways. The **Point Loma** and **Cabrillo formations** represent layers from different parts of the alluvial fan. The **Bay Point Fm.** and the **Linda Vista Fm.** however, are the products of continuous plate tectonic movement and erosion caused by waves.

Alluvial Fan Deposits



Alluvial fans are blankets of gravity-deposited sediment under the ocean. If we drained the ocean, the alluvial fan that created the Point Loma Peninsula might look something like this.

Sandstone



Sandstone is made of layers of sediment deposited by alluvial fans and compressed over time to make stone. Because it's made of sand it erodes (breaks away) easily – be careful climbing around the cliffs!

Fissure (Cracks)



Cracks such as these were created when the peninsula was uplifted and tilted by plate tectonics.

Marker/Bolt



These metal bolts are used in biological surveys. The bolts enable scientists to return to the same location year after year for long-term monitoring programs.

Concretion



Concretions are geologic features that are created much like a pearl: they start with seed material, such as a shell, then layers of calcium carbonate build around it, continuing to layer and harden over time.

Inoceramid



This true fossil is that of a large, thin bivalve (2-shelled animal) called an Inoceramid. These relatives of modern-day clams went extinct near the end of the Cretaceous period, around 65 million years ago.

Trace Fossils



Trace fossils are fossilized tunnels that were made by animals as they searched for food in the sand. The left trace fossil was created by a relative of modern-day sea urchins, the right two trace fossils were created by relatives of modern-day shrimp.