

THE GEOLOGIC STORY

Deep under the remnants of the ancient river lies 120 million year old volcanic bedrock. It makes a good solid foundation when unweathered. When the trolley line was built, the engineers were careful to put the foundations deep into the fresh, hard, crystalline bedrock. They avoided the soft reddish brown clay that had developed in the upper part of the bedrock.



The reddish brown clay soil tells us that Eocene San Diego had a tropical climate. The average temperature was probably 80 degrees Fahrenheit, 10 to 15 degrees warmer than today. The average annual rainfall was greater, about 40 inches. The clay layer is thick, over 25 feet in some places, telling us the bedrock weathered in this tropical climate for millions of years.

By studying the rocks, their position in the strata, soil development, and fossil plants and animals, scientists have reconstructed the environment 42 million years ago. This interpretation illustrates such an environment.



Courtesy of San Diego Natural History Museum Artist Jim Mellis

EOCENE SAN DIEGO

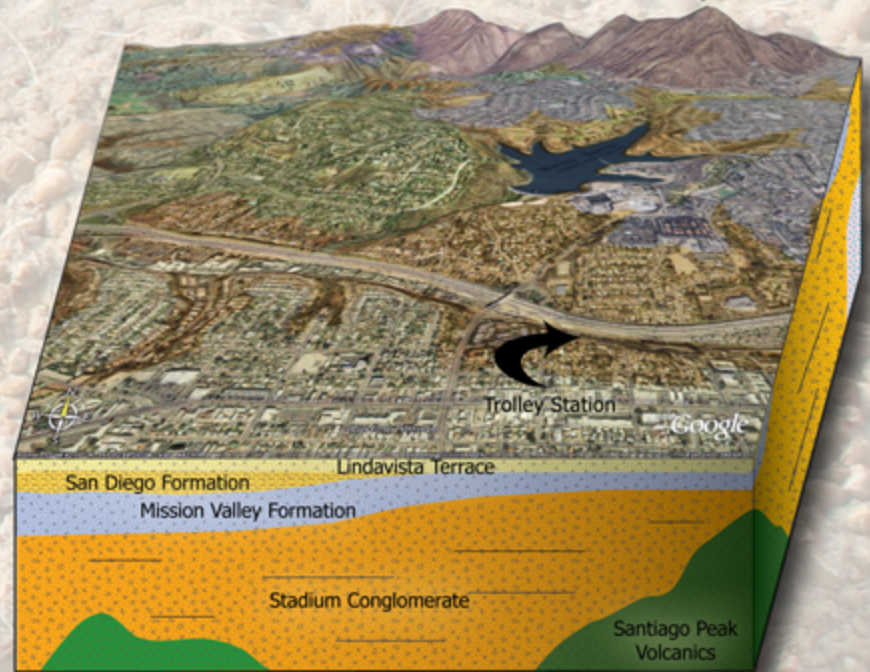
42 million years ago the climate was much like the Mexican state of Sinaloa. The winters were probably warm and dry with a summer monsoon which would make the forest lush and green. Taposcyon is the predator in the tree watching the small herd of Protoreodon feeding on figs and other fallen fruit. Tortoises related to our present day desert tortoise roamed the forest floor.

This brightly colored geologic map was created by Michael Kennedy. It shows his interpretation of the geology in the vicinity of the trolley station. The cliff opposite the trolley station parking lot is a distinct stratigraphic unit (rock layer) called Stadium Conglomerate shown in orange on the map.



GEOLOGIC MAP

This 42 million year old Eocene formation is composed of non-marine cobble and pebble conglomerate with sandy interbeds. By mapping the rocks at the surface, geologists can infer what rocks might exist hundreds of feet below the surface. This cross section shows one such interpretation.



The layer above the Stadium Conglomerate is sandstone and siltstone that formed from fine-grained sand and silt deposited in a lagoonal environment near sea level. This unit is called the Mission Valley Formation, which was deposited 42 million years ago at the same time as the Stadium Conglomerate. The San Diego Formation is a marine sandstone unit above the Mission Valley Formation. It is 2 million years old. We don't know what the environment here was like between 2 million to 40 million years ago because there is an absence of layers that age to tell us.

Acknowledgements

Prepared by David M. Bloom, Tony Carrasco and Nina Karavasiles, with assistance from members of the San Diego Association of Geologists, San Diego State University, and the San Diego Natural History Museum.