The Geology of Coos Bay

by Kenn Oberrecht

Geology is the science concerned with the physical history and dynamics of earth. It's not only a study of the rocks and sediments that form our planet, but also of past and present physical, biological, and chemical processes that have shaped and reshaped earth and continue to do so.

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The major geologic processes in Coos Bay include the tidal movement of salt water, the inflow of fresh water, water mixing, and sedimentation. Flood tides transport sand into the estuary; rivers and creeks carry in silt, sand, and clay. Winds also erode dunes and blow loose sand into the bay.

Deposition of sediments in Coos Bay has created shoals, tidal flats, and tidal marshes. Bottom material of the upper bay is mainly silt, fine sand, and mud. Downbay, the bottom is predominantly sand and shell fragments. Sand is abundant in the main channel.

Just over half of Coos Bay's 12,380 acres consist of tidal flats. These areas, exposed to air during low tide, are composed of mud, silt, sand, and clay. Content of organic matter varies, but can be high, and sediments are compacted in some places.

About 1,400 acres of lower Coos Bay are eelgrass tidelands--critical habitat for many organisms, including the juveniles of various commercial species. Of like importance are the 2,700 acres of tidal marsh--consisting of organic soils made up of sand, silt, and clay--which support lush growth of vegetation.

The North Spit is mainly deflation plain and beach sand with areas of both unstable and stable sand. Where natural or introduced vegetation thrives, the sand has been stabilized.

On the east side of the bay, along East Bay Drive, are older deposits of deltaic sandstone, siltstone, and beds of coal, covered by sandy or silty loam or loamy sand. These deposits are from the late to middle Eocene Epoch, 40 to 55 million years ago.

Flood plains of the Coos River and major bay tributaries--Ross, Catching, Stock, Willanch, Kentuck, Larson, Palouse, North, and South Sloughs--drain sandstone and siltstone terrain. Sediments there are mostly alluvial deposits of sand, silt, clay, and mud.

Most of the sediment deposits in the estuary are from the Holocene or Recent Epoch, which dates from 10,000 years ago to present. Much of what borders the bay along the south shore, from North Bend to the ocean, however, is made up of ancient marine deposits of sand, silt, and gravel, from the Pleistocene Epoch, dating back two million years.

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Human activity also greatly affects geological processes in the bay. Manmade structures, for example, can alter or impede the flow of fresh or salt water, or can influence the way water circulates through the estuary and how sediments are deposited. Coos Bay is a complex environment where countless organisms depend on its well-being, and humans are the only ones who can do anything about it.

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