

Science lecture #8: Subtidal Ecosystems of Hawai'i

In addition to coral communities associated with fringing reefs, corals extend to depths of at least 50 meters (162 feet) in Hawaiian waters. Spectacular coral development occurs on submarine surfaces of recent lava flows too, off the coasts of Maui and Hawaii, and in the waters between Maui and Molokai.

Submerged coral communities along the Kona coast of the island of Hawai'i appear to be better developed than those off the leeward coast of other islands because of the large size of Hawai'i and the heights of its three major volcanic peaks: Hualalai, Mauna Kea, and Mauna Loa. Perhaps they provide protection from tradewind-generated seas.

Three distinct coral communities are recognized in Hawaiian waters:

Pocillopora meandrina are associated with coastlines where there is high wave action and a basalt boulder or rubble substrate, and in depths of less than 2 feet to more than 90 feet. These are the first coral forms to appear on new lava flows and are the dominant elements seen in the shoreline zone off the Kona coast, and in most shoreline areas off Kauai and the windward coast of O'ahu. The *P. meandrina* assemblage is often interspersed with other species of corals such as *Porites lobata* and *Montipora verrucosa*. 54 species of fish have been reported in these regions.

Porites lobata are also associated with shallow water. It is often found in protected bays and are apparently successful in populating almost any consolidated area from shallow depths down to 30 meters (97 feet). However, it modifies its growth form in response to the physical conditions of the environment: where there are surges, the coral is usually flat and encrusting; in deeper waters the coral occurs as large, lobate, or platelike colonies. The dominant reef fish in these regions are chaetodons, and algae such as *Halimeda* and *Turbinaria* are prominent members too.

Porites compressa are found at depths ranging from 1 meter (3 feet) to more than 50 meters (162 feet). The colonies of this assemblage are distinct in that the coral is of a branching type, forming fragile thickets that may extend for hundreds of square meters. These assemblages are also prominent in protected bays such as Kane'ohu Bay on O'ahu, and on the Penguin Bank between Maui and Moloka'i.