

**Student Edition**

California Education and the Environment Initiative

**B**

Biology Standard  
B.8.a.



# Differential Survival of Organisms

# Coastal Wetland Background Information

Coastal wetlands connect the watersheds of coastal areas with the ocean. Water moves through this ecosystem dynamically; both the inflow and outflow of rainfall runoff and tidal movement from the ocean affect this environment. Fluctuations in runoff and tidal movement can increase or decrease the salinity of water in wetlands; for example, an influx of rainfall decreases the salinity of water in wetlands, while tidal movement brings in salty water from the ocean. The movement of water from both sources also affects the amount of nutrients in the water. In California, tidal movement, which brings in cold ocean waters, strongly affects the temperature of water in wetlands.

Water movement also affects coastal wetland substrates. Runoff carries sediment into wetlands, where it settles out and deposits onto the wetland floor. Tidal flow carries some sediment out to the ocean, where it settles onto the ocean floor or gets transported to other areas.

Coastal wetlands support diverse aquatic plants and animals, as well as terrestrial vertebrates. The level of nutrients here strongly affects primary producers. Some, like pickleweed, are adapted to high salinity in the water. Animals depend on these plants for food and shelter. For example, the larvae of brine flies eat decaying vegetation in the water, and as adults these flies serve as food for many bird species. The muddy waters of wetlands provide an ideal habitat for animals like bat rays, which flap their fins to move the silt and expose their prey of mollusks, crustaceans, and small fish along the sandy bottom. Burrowing animals, such as worms, depend on the muddy substrate, while dragonfly larvae need shallow water to grow into adults.

In California, human activities have reduced the total area of wetlands, including coastal wetlands,



Shorebirds

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Elkhorn Slough, California

mudflats, and salt marshes, by 97%. Development and water diversion especially affect wetland areas. Real estate developers prize coastal locations, and purchase and fill them in with dirt and sediment so they can build up residential and commercial projects. The development or expansion of airports in Santa Barbara, Los Angeles, San Francisco, and San Diego all involved the filling in of coastal wetlands.



Birds flying over salt marsh, Moss Landing, California

Water diversion, like development, also leads to the filling in of wetlands. In natural conditions, flowing water transports sediment from wetlands to the ocean. Decreased water flow as a result of diversion allows sediment to build up within a wetland and eventually in the waterways that flow to the wetland.

Pollution frequently contaminates water flow in local watersheds. Wetlands typically filter water moving off the land; if, however, the contaminant load is too great, the concentration of the pollutants may affect burrowing animals and other aquatic species.

As more and more people recognize the importance of wetlands as a habitat for migrating aquatic bird species and for the ecosystem services they provide, they are making greater efforts to restore many wetland regions. California has protected its remaining wetlands and begun habitat restoration programs in several areas where the wetlands have been substantially changed by human activities. The introduction of stronger regulations restricting terrestrial pollution has also decreased the number of contaminants that reaches wetlands.