



CORDELL BANK NATIONAL MARINE SANCTUARY



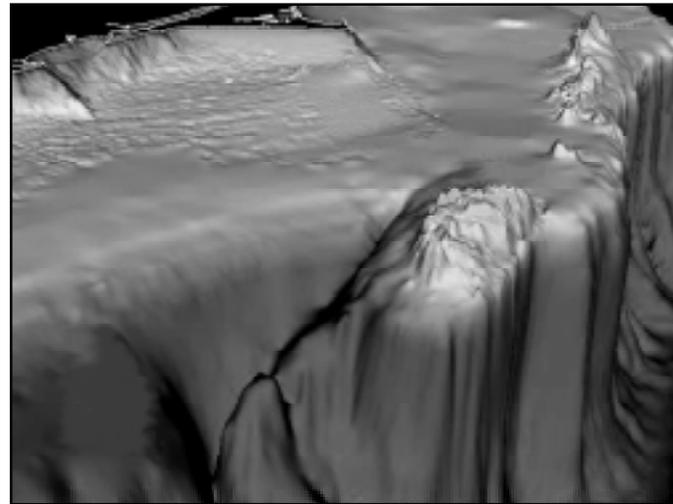
“Cordell Bank is a Sanctuary. It’s brimful of life. The fish are never cranky. The place is very swanky.”
Jimmy Gilardi, 4th grade, West Marin School

Cordell Bank is a seamount that is located about 50 miles northwest of San Francisco and about 25 miles west of Point Reyes. This underwater mountain, perched near the edge of the continental shelf, is 9.5 miles long by 4.5 miles wide and rests on 21 square miles of seafloor. Its granite peaks rise from the continental shelf to within 115 feet of the water’s surface. The Bank is washed with nutrients from the prevailing California Current and seasonal upwelling. A unique combination of undersea topography and oceanic conditions join to create an extremely productive marine environment. Naturalists and researchers travel to the waters above Cordell Bank to observe and study the rich display of marine life. The productivity around this underwater mountain also supports active commercial and sport fisheries. In 1989, this highly productive area was designated a National Marine Sanctuary. The Sanctuary consists of Cordell Bank and a surrounding buffer zone that protects an area of 526 square miles.

WAVES AND CURRENTS

Waves and surface currents at Cordell Bank are primarily wind-driven and have three oceanographic seasons: upwelling, relaxation, and storm. In the spring and early summer, during the upwelling season, the wind-driven California Current flows south past Cordell Bank. As the surface water moves south it is displaced to the west, offshore, because of the force caused by the earth’s rotation, known as the Coriolis effect. This westward moving surface water is replaced nearshore by cold, deep, nutrient-rich water. By late summer and fall, the north winds die down and the sea

illustration by Pieter Folkens



Computer imagery showing Cordell Bank and the dropoff of the continental shelf.

Computer imagery courtesy of USGS Woods Hole

surface calms as the relaxation season begins. At this time, the wind-driven California current is replaced at the surface by the northward-moving Davidson Current. The third and last oceanographic season, the storm season, lasts from about mid-November through early spring and is characterized by strong southerly winds and rough seas.

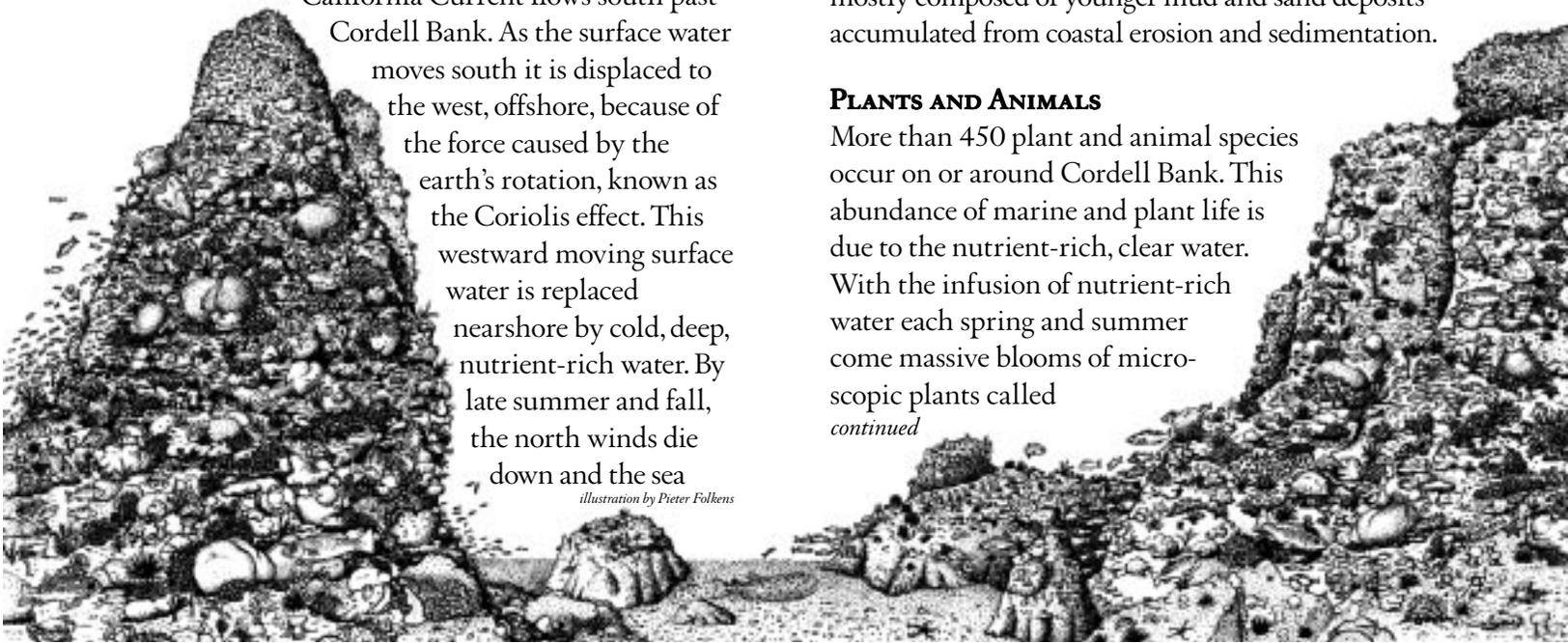
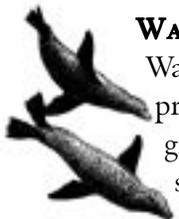
GEOLOGY

The Salinian bedrock of Cordell Bank was originally created about 93 million years ago as part of the Sierra Nevada Range. This granitic mountain originated in southern California and has been carried north with a piece of the earth’s crust (the Pacific plate) at a rate of a few centimeters a year. However, sediments surrounding the base of the seamount on the continental shelf are mostly composed of younger mud and sand deposits accumulated from coastal erosion and sedimentation.

PLANTS AND ANIMALS

More than 450 plant and animal species occur on or around Cordell Bank. This abundance of marine and plant life is due to the nutrient-rich, clear water. With the infusion of nutrient-rich water each spring and summer come massive blooms of microscopic plants called

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phytoplankton. These primary producers form the base of a complex food web, providing food for tiny animals known as zooplankton. Swarms of plankton in the water column provide food for at least 38 different species of fish, 47 species of seabirds, and 27 species of marine mammals around Cordell Bank.

The diverse assortment of bottom-dwelling organisms on Cordell Bank is exceptional because of the nutrient-rich waters and the penetration of more light through the water column. Turbidity is decreased at the Bank because water clarity is not influenced by coastal river runoff or suspended sediments from waves nearshore. Organisms, such as red algae, can grow deeper here because of the light penetration due to increased water clarity. There are several previously undiscovered species present at Cordell Bank, as well as species unusual in these waters or at these depths.

The bottom of the Bank (at depths greater than 230 feet) is covered with coarse calcareous sediment with scavenging brittle stars, crabs, and urchins. From the bottom up to 150 feet, the residents consist of hydrocorals, sponges, anemones, red algae, decorator crabs, and sea urchins. Above depths of 150 feet, light increases and current-born nutrients are abundant. Packed one atop another, the benthic organisms fight for space on the upper reaches of this submerged mountain. In some places, sponges, anemones, hydrocorals, hydroids, tunicates, and crabs cover the seamount in a mass that can be as much as a foot thick. At the top of the Bank, at depths from 125 to 115 feet, barnacles and red algae dominate the cover.

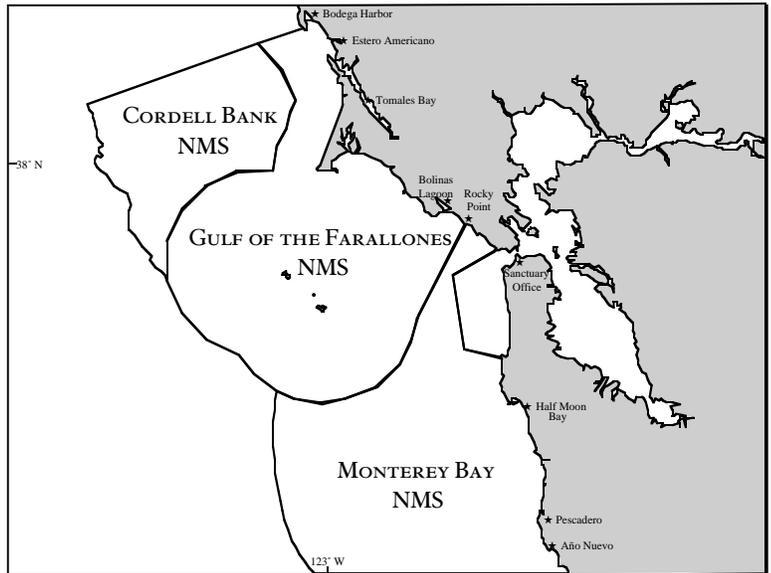


KRILL

Euphausiid shrimp, commonly referred to as “krill,” swarm in dense concentrations in the waters around Cordell Bank. These tiny shrimp-like creatures are important food for many of the resident animals, and are the reason that other animals migrate to the Bank. A critical link in the marine food web, krill are devoured by invertebrates, fish, seabirds, and the great whales.

FISH

The food-rich waters of Cordell Bank support at least 38 species of fish. The most abundant are the rockfish, with 14 species ranging in size from 14 inches (rosy rockfish) to 3 feet (yellow-eye rockfish).



BIRDS (a partial list of birds common to Cordell Bank National Marine Sanctuary)

<i>Common Murres</i>	<i>Storm-petrels</i>	<i>Pigeon Guillemots</i>
<i>Phalaropes</i>	<i>Albatrosses</i>	<i>Cormorants</i>
<i>Brown Pelicans</i>	<i>Cassin's Auklets</i>	<i>Tufted Puffins</i>
<i>Shearwaters</i>	<i>Rhinoceros Auklets</i>	<i>Gulls</i>

MARINE MAMMALS

<i>minke whales</i>	<i>harbor porpoise</i>
<i>blue whales</i>	<i>killer whale</i>
<i>fin whales</i>	<i>sperm whale</i>
<i>sei whales</i>	<i>beaked whales</i>
<i>humpback whales</i>	<i>pygmy sperm whale</i>
<i>right whales</i>	<i>dwarf sperm whale,</i>
<i>gray whales</i>	<i>short-finned pilot whale</i>
<i>pacific white-sided dolphin</i>	<i>California sea lion</i>
<i>common dolphin</i>	<i>northern elephant seal</i>
<i>striped dolphin</i>	<i>harbor seal</i>
<i>Risso's dolphin</i>	<i>northern fur seal</i>
<i>northern right whale dolphin</i>	<i>Guadalupe fur seal</i>
<i>bottlenose dolphin</i>	<i>Steller sea lion</i>
<i>Dall's porpoise</i>	

Cordell Bank is a unique and important area for all kinds of marine life. We are still learning about the breadth of its amazing diversity and are gradually uncovering more of the mysteries that surround it. As a National Marine Sanctuary, Cordell Bank is protected so that we and future generations may learn more about the underwater realm. Cordell Bank is a national treasure, a jewel off the California coast, which provides us with an opportunity to discover more about the secrets of the sea.

Cordell Bank National Marine Sanctuary is managed by the staff of the Gulf of the Farallones National Marine Sanctuary. For more information, contact the Farallones Marine Sanctuary Association at (415)561-6625 or visit www.farallones.org

