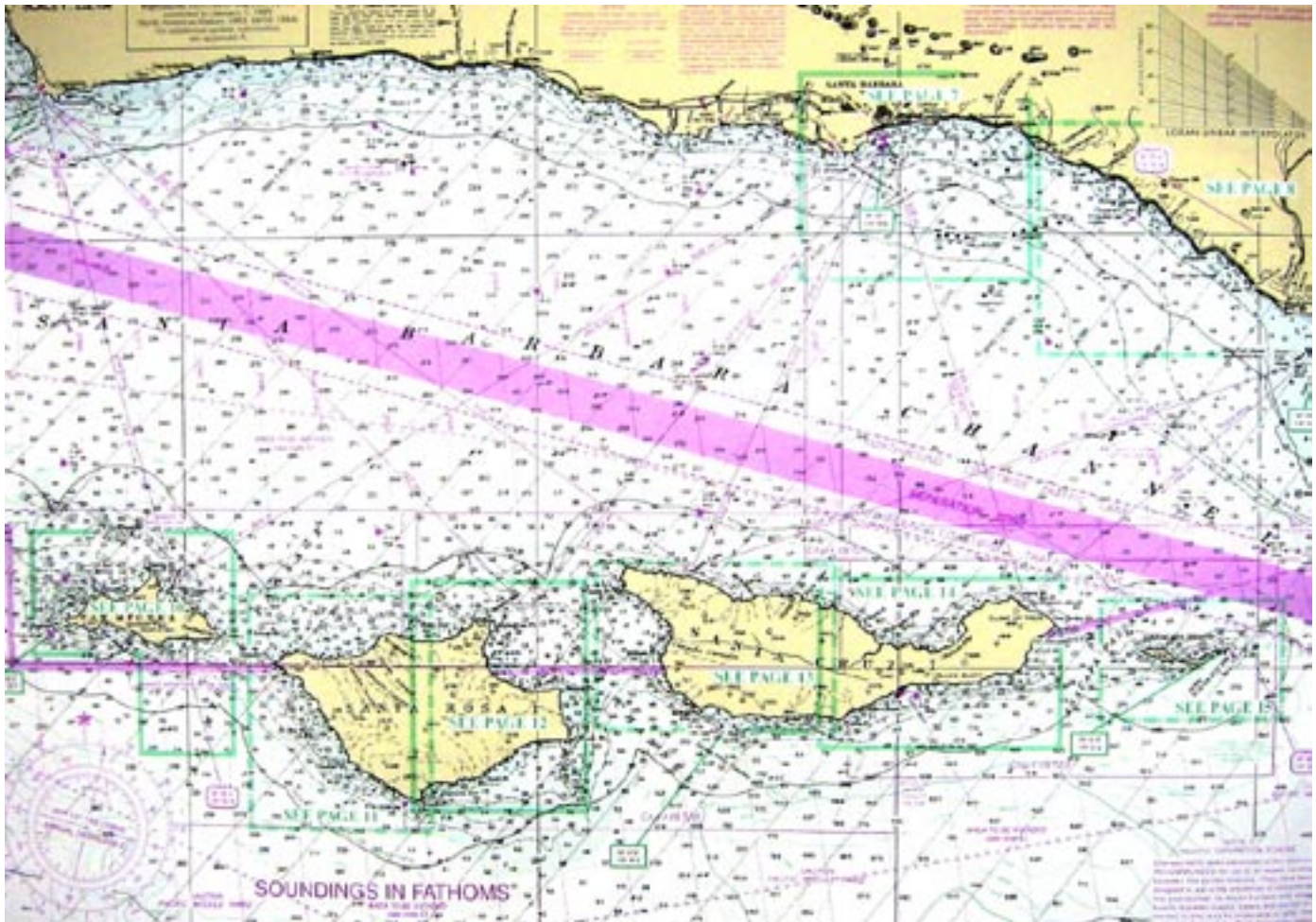


Crossing The Channel

Nautical Charts are used to navigate the oceans and seas of the world. Charts and maps are marked in patterns of intersecting horizontal and vertical lines called latitude and longitude. Lines of latitude show the distance north or south of the equator and are represented in degrees. Lines of longitude show the distance east or west (also measured in degrees) of a line known as the Prime Meridian, that runs through Greenwich England. There are 60 minutes in each degree, which results in locations that are read in degrees and minutes. Example: the east end of Anacapa Island is approximately at a latitude of 34 degrees 4 minutes north, and 119 degrees and 21 minutes west. The location, like a street address for the East end of Anacapa would be written as 34°04' N, 119° 21' W. For many years, charts and a compass were the primary tools used for navigation. While both are still used today, modern mariners enjoy advances in electronic navigational aids such as the Global Positioning System (GPS). GPS is a system that uses a constellation of 24 satellites, their ground stations, and individual GPS receivers to accurately locate points on Earth.

Nautical Chart of the Santa Barbara Channel



The area between the California Channel Islands and the mainland is referred to as the Santa Barbara Channel. This area of the coast falls within the larger area known as the Southern California Bight. The Southern California Bight is a region that includes coastal southern California, the Channel Islands and the local portion of the Pacific Ocean. The boundary of this area extends from Point Conception to just south of San Diego, and offshore as far as San Nicholas Island. This section of the California coast is unique in that it doesn't have the characteristic north-south orientation of the majority of the west coast. Instead there is a significant curvature, and the coast has more of an east-west orientation. This area with its unique orientation and the presence of offshore islands, creates complex current circulation patterns, and is a temporary or permanent home to a wide variety of marine organisms.

Where Currents Collide

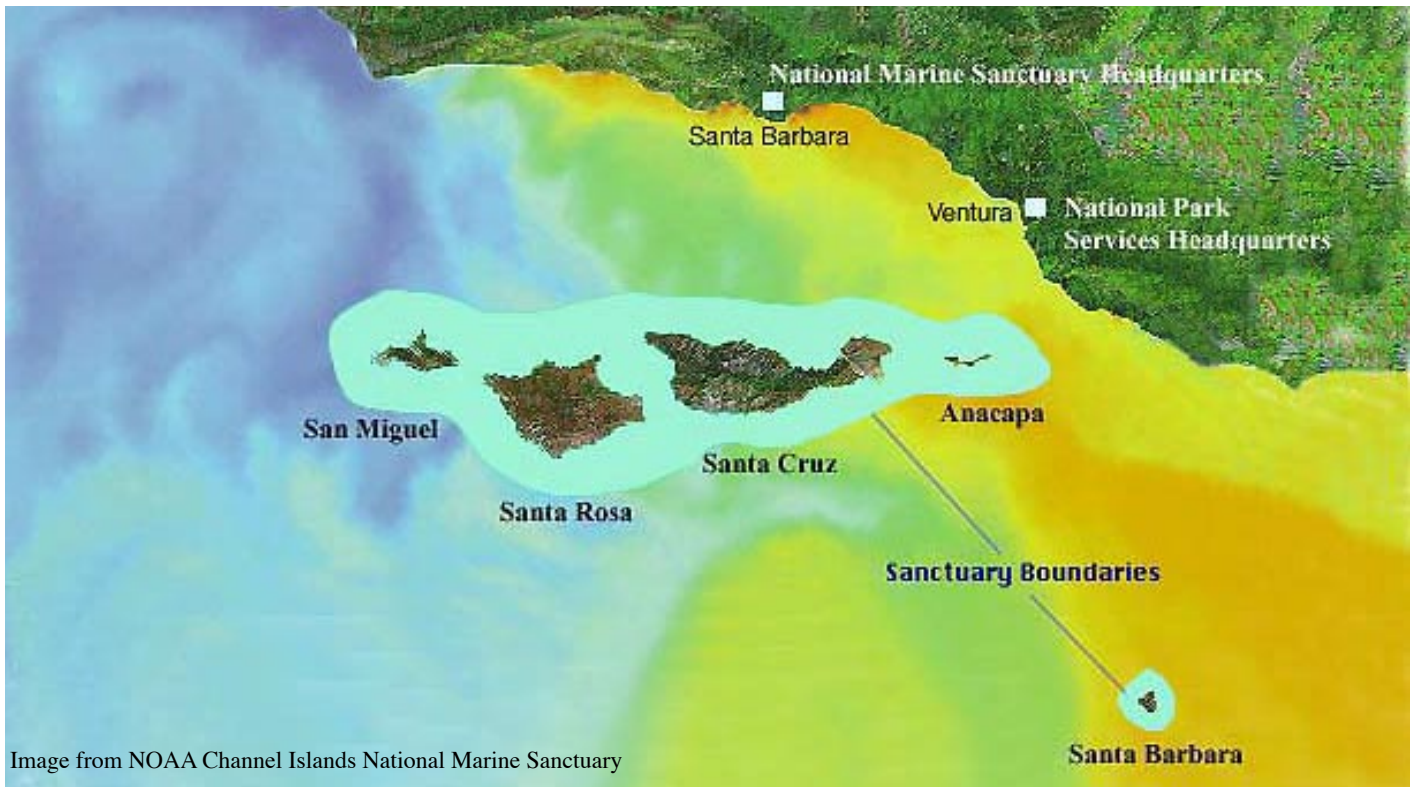


Image from NOAA Channel Islands National Marine Sanctuary

Water temperature plays a significant role in the distribution of plants and animals. In the Channel Islands region a large flow of cool water called the California Current, comes down from the Northern Pacific. A slightly warmer current comes up from Mexico. Because the Channel Islands are right where these two currents collide, the resulting environment known as a transition zone, supports a wide variety of marine species. The image above from the Channel Islands National Marine Sanctuary shows the mixing of the cooler (blue/green color) waters, with the warmer (orange /yellow color) waters.

The garibaldi is a fish species that is found in areas influenced by the warmer current from the south. Their range is from Baja up to Monterey Bay, yet it is rare above Point Conception.



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The California spiny lobster is an invertebrate species that prefers the warmer southern current. Their range is from Baja to San Luis Obispo, yet rare north of Point Conception.



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Lingcod, although found as far south as Baja, are more abundant in cooler waters and range as far north as Alaska. This fish feeds on fish, squid and octopus and can reach five feet in length.



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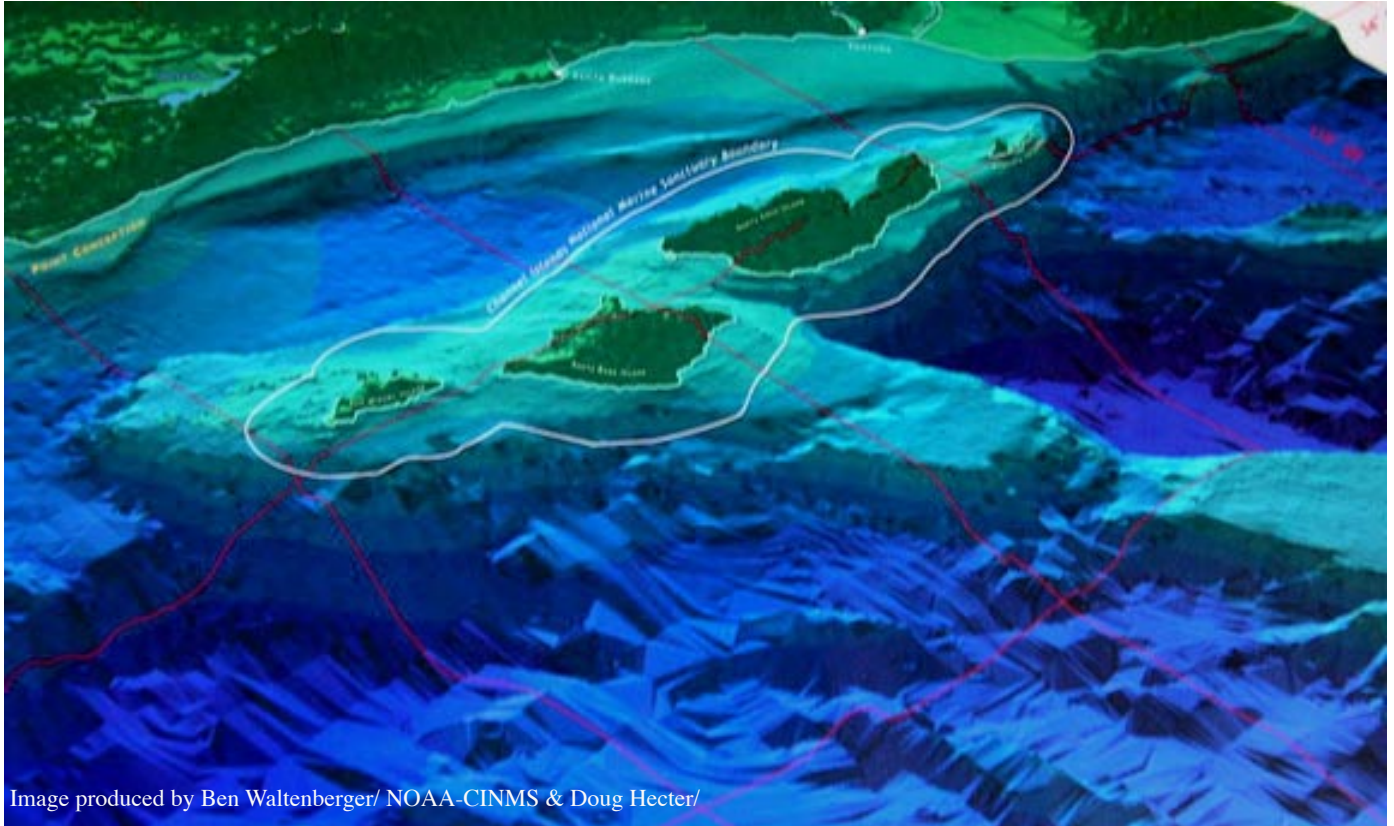
The orange or fleshy sea pen, is also known from areas influenced by the cold current. This species is abottom dwelling invertebrate living in mud or sandy sea floors. The range for this species is Alaska to southern CA.



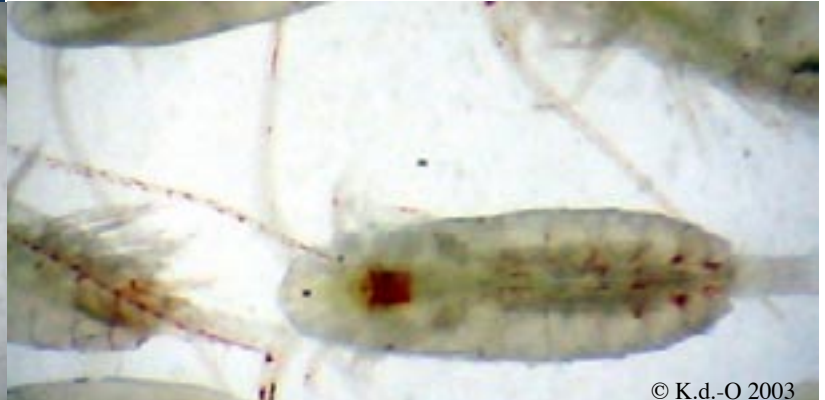
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Upwelling

In places where there is significant bottom relief such as canyons, cliffs (escarpments), and sea mounts, currents flowing along the bottom are interrupted, and create upwellings. Upwelling brings cold deep nutrient-rich waters to the surface. The nutrients can feed plankton, which in turn feed small fish, which are fed upon by larger fish, marine mammals and sea birds. In the 3D diagram below, the darker shades of blue indicate very deep water and the lighter blue and blue/green shows areas that are not as deep. The bottom relief around the northern Channel Islands is ideal for producing nutrient upwellings.



When sea conditions permit, an Island Packers naturalist will demonstrate the use of a plankton net, and classes can sample the water to examine any plankton that is present. Some plankton can be observed with the naked eye, and a great amount of detail can be observed when viewed through a microscope. The sample below is magnified X10, and shows a juvenile Euphausiid (krill) lower left, and copepods. Copepods are thought to be one of the most abundant forms of zooplankton found in the world.



Identifying Marine Mammals

This is a brief visual guide to some of the marine mammals that can be seen crossing the channel. The following websites are recommended for gathering specific facts and more information about the species shown in this section: **1. The Marine Mammal Center** <http://www.marinemammalcenter.org/learning/education/mammalinfo/mammals.asp> **2. The American Cetacean Society** <http://www.acsonline.org/factsheets.htm> **3. Ocean.com the Encyclopedia of the Channel Islands National Marine Sanctuary** <http://www.ocean.com/Library/Encyclopedia/> Also, check the resources folder in the Island Packers Education CD-ROM



Common dolphin: this is the most abundant cetacean (whale or dolphin) off the west coast. So if you see a pod of dolphins during your crossing, there is a good chance they are common dolphins. Positive identification is made by the triangular or slightly curved dorsal fin, distinct and narrow rostrum or snout, and the color pattern. The color pattern is dark gray-to-black on top to the back of the dorsal fin, the tail area is lighter gray, the belly and sides forward of the dorsal fin are very light in color.



Pacific white-sided dolphin: this species is seen once and awhile, but not as frequently as the common dolphin. The way to identify this species is to look at the shape of the dorsal fin, this shape is called falcate (curved) and the color of the fin is usually black in front and white on the back edge. The face is sloping and has a short rostrum or snout. The topside of the body is dark and there is a light colored marking running down the side from about the chin to the tail.



Risso's Dolphin: this dolphin can be shy and sometimes will not come close to boats. they have a very tall dorsal fin and a unique color pattern of gray skin covered with white scars. The face is somewhat rounded with a tiny rostrum or snout. The young animals have fewer scars, while older animals may be so heavily scarred they appear white.



Pacific gray whale: this species makes two migrations through the Santa Barbara Channel each year. First they head south towards Baja in winter, and then pass through again in spring as they return north. This whale doesn't have a dorsal fin, but a series of ridges can be seen on their back. Their skin color is gray with lots of light patches.



Humpback whale: unlike the gray whales, which simply pass through the local waters, humpbacks travel to the Santa Barbara Channel to feed during periods of nutrient upwelling in the spring or summer. The dorsal fin of the humpback has a bump or lump in front of the triangular tip. The tail of each whale species also has a unique shape. The tail of a humpback is deeply notched in the center.



California sea lion: sometimes an easy way to identify a sea lion is by what you hear, not what you see. Sea lions have a loud distinct bark, and they are not shy about making a lot of noise. The sea lion has a dog-like face and little ears. The color of their fur will vary from golden to dark brown. The pectoral flippers are large and well suited for both swimming and climbing. As the male starts to mature, between 5-10 years of age, he will develop a bony lump on his forehead, a feature called a sagittal crest.



Blue whale: this species like the humpback, comes to the Channel Islands region to feed during the spring and summer months. An overall grayish-blue color, long robust body, and a tiny dorsal fin are key physical characteristics to look for when identifying a blue whale. Spouts of whales are also unique to each species. The spout of a blue whale looks like a tall mushroom shaped cloud.



Pacific harbor seal: this species is not as vocal as the sea lion. The sound made by a harbor seal is more like the sound of a bleating sheep than a barking dog, and they tend to be rather quiet. The face of the harbor seal is rounded like the face of a cat, and they have an ear opening with no ear flap. The color of the fur is mottled gray and black. The pectoral flippers are smaller than those of a sea lion and adapted for grasping and scratching at rocks to stir up an octopus, one of their favorite prey items.