Marine-Themed Interpretative Signage at the Sea Center

2017 CREF Proposal

GIANT KELP FORESTS

Spanish Shawl nudibranch on a kelp frond. Photo by Sam Spaulding.

Close-up of gas-filled bladders and kelp blades. Photo by John M. Hayne.

Root-like haptera make up the kelp holdfast. Photo by Shane Anderson.

Some of the most extensive submarine forest in the world lie off the Santa Barbara coast in 30 to 60 feet of water. One forest lies just beyond the Santa Barbara breakwater, others can be found around the northern Channel Islands.

Giant Kelp, a species of brown algae, is the dominant plant in these submarine forests. One of the fastest growing plants in the world, Giant Kelp can grow up to two feet a day and reach 200 feet in length. Kelp plants have no true roots, stems, leaves, or flowers. Each plant is anchored to rocks or debris on the ocean floor by a mat-like network of strands called a holdfast. Growing upward from the holdfast are slender stalks, or stipes, that sprout leafy blades at regular intervals. Small gas-filled bladders are located at the base of each blade to buoy up the long kelp fronds. At the ocean surface, the fronds of several plants may intertwine to form a dense kelp canopy.

Kelp forests provide habitats for a variety of plant and animal life. Marine invertebrates such as sponges, hydroids and bryozoans attach themselves to holdfasts and rocky outcroppings on the sandy floor. Worms, seastars, crabs, lobsters, shrimp, sea urchins, snails, and abalone crawl in and around the holdfasts, and octopuses and bottom-dwelling fish glide along the ocean floor. Farther up the kelp plant, the kelp blades are covered with a myriad of encrusting plants and animals. Small fish graze on these organisms and hide in the blades to escape from bigger fish, sea lions, and sharks.

Compared with forests on land, kelp forests have a short lifespan, sometimes lasting only a few years. Storms and grazing marine animals eventually weaken holdfasts, and ocean waves wash the plants ashore. During severe storms, older kelp forests may be almost destroyed. Dozens of younger plants, their fronds entangled in the kelp canopy, are also swept away. But as the sunlight reaches the ocean floor again, new plants sprout from kelp spores that have drifted to the bottom.

Kelp canopy. Photo by Sam Spaulding.

Kelp is a rich source of vitamins, minerals, and nutrients and has long been used by humans as a food supplement and for fertilizer. Kelp was first commercially harvested in Santa Barbara during World War I, when German potash fertilizer was unobtainable. During the later 1920s, scientists discovered that algin, an emulsifying and stabilizing agent, could be commercially manufactured from kelp, and a kelp-harvesting industry rapidly developed. Today, algin is used in many familiar products such as ice cream, cosmetics, medicine, paint, plaster and paper. In the future, kelp may provide a new source of fuel; decomposition of kelp produces methane, a useful and renewable substitute for natural petroleum gas.

Kelp harvester. Photo courtesy of KELCO.

See a rocky reef habitat at
The Sea Center
on Stearns Wharf.

A lifesize recreation of a submarine kelp forest is in The Marine Hall at
The Santa Barbara Museum of Natural History
located just beyond the Old Mission.

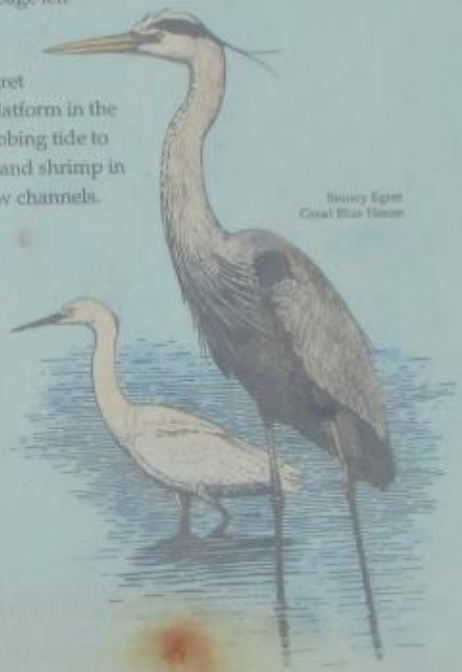
COMMON BIRDS OF THE HARBOR

Photo by Gary Robinson

The Santa Barbara Harbor provides feeding grounds and resting areas for more than 20 species of birds. On the beach, Sanderlings, and various species of sandpipers and plovers use their stubby bills to pick tiny sand crabs, beach hoppers, worms, insects, and other bits of food from the sand. Long-billed Curlews, Willets, Whimbrels, and Marbled Godwits have longer bills and probe farther into the sand.

Surf Scoters, Common Loons and Western Grebes dive deep to the harbor bottom in search of fish, clams, and scallops or explore the pier pilings for mussels. Farther off shore, "high diving" Brown Pelicans cruise above the ocean surface watching for fish. When they spot their prey, they fold their wings and plunge headlong into the water, using their pouch as a scoop. Western Gulls feed mostly on dead fish, but will steal live food from pelicans and other gulls if they can, or will scavenge garbage left by humans.

Occasionally a Great Blue Heron or Snowy Egret will perch on a boat or platform in the harbor, waiting for the ebbing tide to expose small fish, crabs, and shrimp in the tidepools and shallow channels.



Snowy Egret
Great Blue Heron

Clockwise from top left: Western Grebes, Eared Grebes, Common Loon, Surf Scoters

Whimbrel, Black-bellied Plover, Sanderlings, Willet

To see more of Santa Barbara's birdlife up close, visit

The Sea Center
on Stearns Wharf
and

The Bird Habitat and Bird Taxonomy Halls at
The Santa Barbara Museum of Natural Histo
located just beyond the Old Mission.

tuary, contact:

Channel

tional Marin

Way, Santa Bar

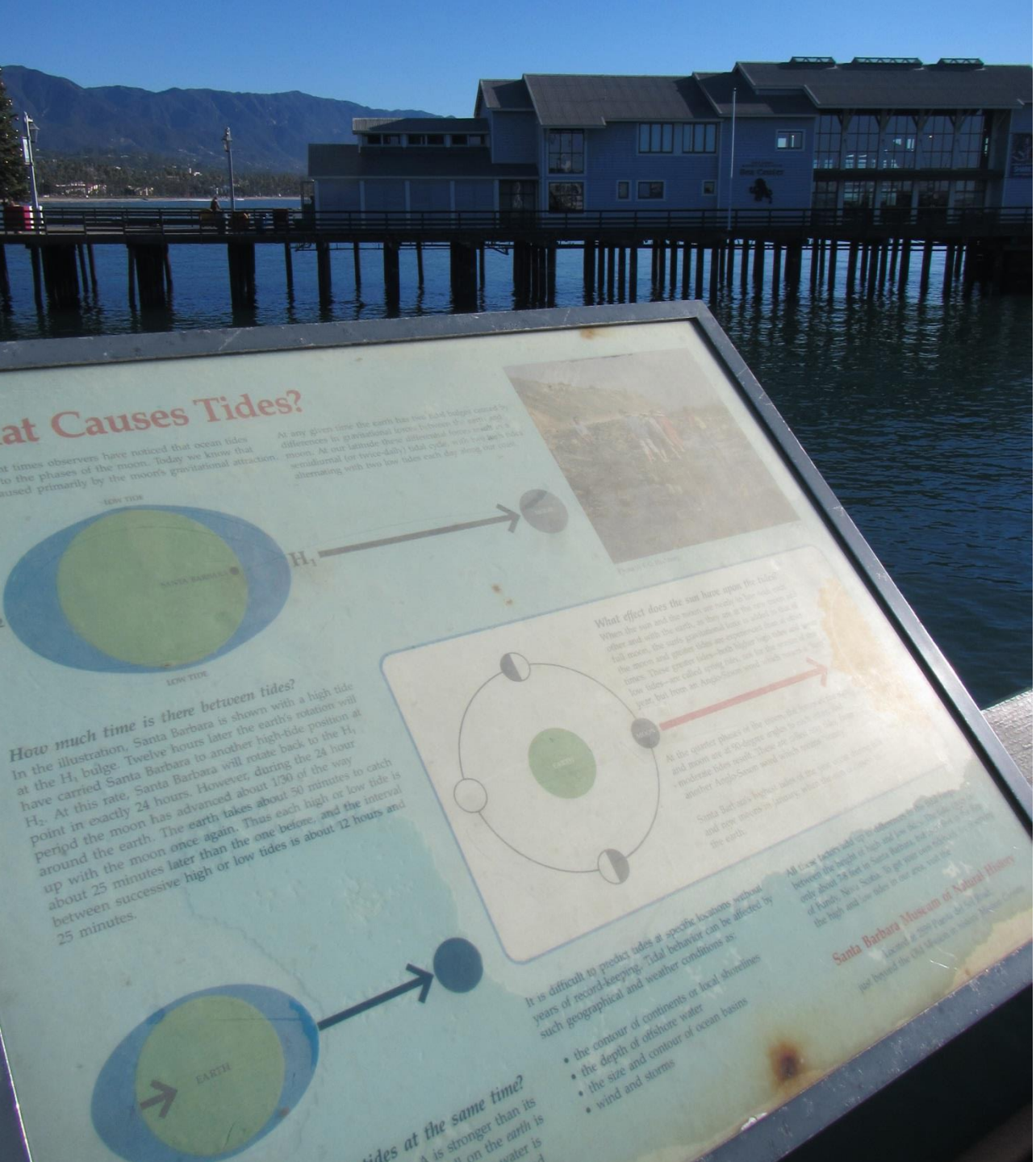
(805) 966-7

or visit

The Sea Ce

on Stearns W


Our proposal also included the addition of one more sign just outside the Sea Center (it would be located along the railing, below).



Nobody wants 2 million or more people to be exposed to these damaged and shabby signs before we can apply for support again.

Scalable Solution

- Eliminate the signage and supplies for inside the Sea Center
- Eliminate the additional sign (#8 on list)
- Pare the project down to replacing the 7 signs installed in 1989

- Total budget is reduced to $38,345.22
- Museum match is $12,156.71
- **Total requested from CREF funding: $26,188.51**
  - This is a reduction of $17,529.25