

Kelp Forests

Underwater havens

You may be familiar with California's magnificent Joshua Trees and redwood forests, but have you heard of our underwater forests? Kelp forests are important habitats in the cold, shallow waters off western North America. While you can find kelp forests scattered along San Diego's coastline, some of the largest are offshore from La Jolla and Point Loma. Certain kinds of kelp are known their ability to grow in dense underwater groups that resemble forests. Kelp forests can contain multiple species; in San Diego, the most common species is giant kelp (*Macrocystis pyrifera*). Although they photosynthesize and have plant-like traits, kelp are actually **algae**. Algae are not plants or animals, but a distinct group of organisms that includes seaweed.

Kelp anchors itself to the ocean floor with a holdfast, which looks like a plant's roots. The long stipe extends from the holdfast towards the surface of the water. In some species, the stipe can grow to be 150 feet long! Along the stipe, you'll find the kelp blades, where photosynthesis occurs. Bubble-like bladders filled with air keep the kelp afloat. Kelp forests support high **biodiversity** because each part of the kelp provides a home to different organisms. The kelp provides shelter, a place to raise young, and hunting grounds for over 800 species in Southern California. Some of San Diego's most iconic species live in kelp forests, including the California Sea Lion and the Garibaldi. Other residents include a variety of fish, invertebrates, and marine mammals. At the surface, many birds feed on the species that dwell in the kelp forests. Kelp provides benefits for people, too. More than 70 percent of the world's oxygen is produced by ocean algae! Kelp forests also provide recreational opportunities and resources used in food, beauty products, and more.

biodiversity: the variety of life in a particular habitat or ecosystem

Help the kelp!

Kelp forests face a number of threats. Sea urchins love to eat through the stipes of giant kelp. In parts of California and Oregon where sea urchins have lost their natural predators, urchins have eaten through so much kelp that they destroyed entire forests. Although the urchins

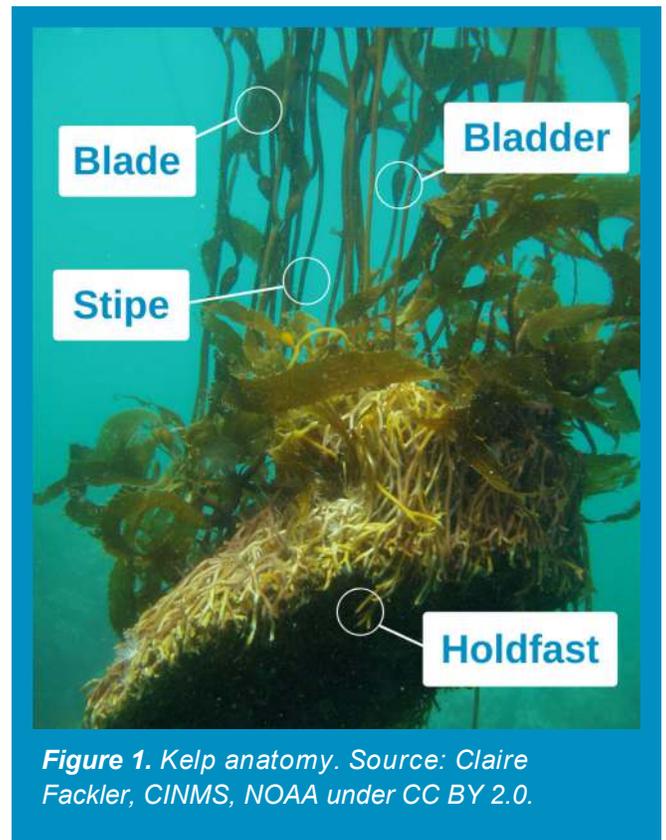


Figure 1. Kelp anatomy. Source: Claire Fackler, CINMS, NOAA under CC BY 2.0.

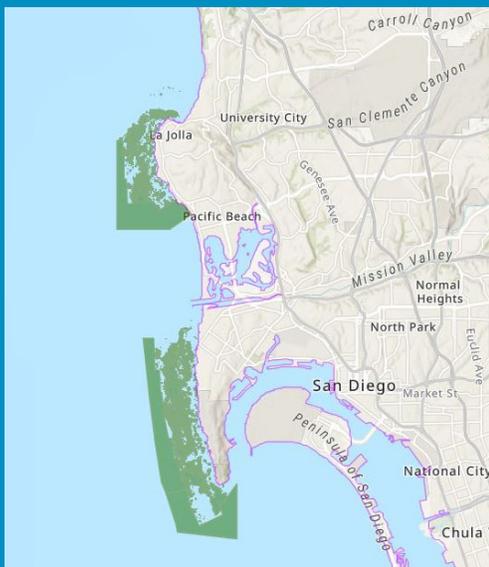


Figure 2. Map of kelp forests near La Jolla and Point Loma. Source: ArcGIS, County of San Diego, Oregon State-Pacific Coast Ocean Observing System

damaged some kelp near Point Loma, the destruction was not as widespread as in Northern California. An overabundance of urchins is not the only problem that kelp faces. Starting in 2014, periods of abnormally warm water brought fewer nutrients that kelp need to grow. El Niño brought intense storms during 2015 and 2016, ripping holdfasts from the ocean floor and destroying huge swaths of kelp forest. Pollution and urban runoff have compounded the issue by making it harder for kelp to survive. Then, in August 2018, scientists at Scripps Institution of Oceanography recorded the three highest water temperatures in La Jolla in over 100 years. The area's water temperature in early August is normally 68°F, but that August temperatures reached 79°F-- more than ten degrees warmer than average! Researchers said that the warm waters paralleled heat waves on land, which are connected to climate change. Projections show that many of these threats will only get worse as climate change continues. Because kelp is sensitive to changes in its environment, scientists are using it to study the health of the surrounding water. In 2019, the City of San Diego and Scripps began a five year monitoring project to better understand how water quality affects local kelp. Studying our kelp forests will help us better protect them in the face of pollution and climate change.



Figure 3. Giant kelp can grow 18 inches a day in ideal water conditions. Source: NOAA National Ocean Service under CC BY 2.0

Kelp is considered an umbrella species— conserving it protects the health of the whole ecosystem. Without kelp, we would lose many of the species that make San Diego's waters unique. We can help the kelp by lowering our carbon footprint, picking up litter, and stopping urban runoff in our neighborhoods. Thank you for doing your part to

keep our underwater forests beautiful!

References

- Garrick, D. (2019, July 15). San Diego spending \$3.6M to monitor local underwater kelp forests. *Chicago Tribune*. Retrieved from <https://www.chicagotribune.com/san-diego-spending-3-6m-to-monitor-local-underwater-kelp-forests-story.html>
- Jennewein, C. (2018, August 8). Ocean temperature at Scripps pier sets 3rd record this month. *Times of San Diego*. Retrieved from <https://timesofsandiego.com/tech/2018/08/08/ocean-temperature-at-scripps-pier-sets-3rd-record-this-month/>
- National Geographic (2020). *Save the plankton, breathe freely*. Retrieved from <https://www.nationalgeographic.org/activity/save-the-plankton-breathe-freely/>
- National Park Service (2016, January 4). *Kelp forest*. Retrieved from <https://www.nps.gov/cabr/learn/nature/kelp-forest.htm>
- Point Reyes National Seashore Association (n.d.). *Seaweeds: plants or algae?* Retrieved from <https://www.ptreyes.org/activities/seaweeds-plants-or-algae>
- NOAA National Marine Sanctuaries (n.d.). *Impacts on kelp forests*. Retrieved from <https://sanctuaries.noaa.gov/visit/ecosystems/kelpimpacts.html>
- NOAA National Ocean Service (2019, November 14). *What is a kelp forest?* Retrieved from <https://oceanservice.noaa.gov/facts/kelp.html>
- Sullivan-Brennan, D. (2019, February 10). San Diego's kelp forests keep a holdfast on coast, despite climate threats. *San Diego Union-Tribune*. Retrieved from <https://www.sandiegouniontribune.com/news/environment/sd-no-kelp-forest-threatened-20190129-story.html>