



The WorldPost Opinion

Part of our ocean is dying

By Thomas Wernberg and
Karen Filbee-Dexter
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Thomas Wernberg is an associate professor of marine botany at the University of Western Australia. Karen Filbee-Dexter is a researcher of benthic communities at the Institute for Marine Research.

PERTH, Australia — Over the last few years, an intense, marine heatwave has decimated Northern California’s kelp forests by helping trigger an explosive growth of the [purple sea urchin](#). This voracious grazer, which some call the “cockroach of the sea,” has devoured these underwater forests, leaving only desert-like expanses behind. What makes this transformation doubly alarming is that kelp forests, which are vital to our ocean, are already in decline globally.

More than a third of the world’s kelp forests have declined over the past half century, and the [evidence](#) points strongly to ocean warming as a main culprit. Since most kelp are cool-water species that dominate in temperate and Arctic waters, warming water causes physiological stress, stronger competition from small, fast-growing algae, and in some places, increased damage from grazers like the purple urchin or tropical fishes that move into temperate waters. Higher temperatures also make kelp forests more vulnerable to additional threats such as extreme storms, overfishing and pollution.

Why should we care that these ocean forests are in decline?

Kelp forests are one of the world’s most diverse ecosystems. These large brown seaweeds grow on rocky reefs along a quarter of the world’s coastlines, creating an essential habitat and food source for a myriad of species like abalone, urchins and barnacles. More than [350](#) different species — over 100,000 individual organisms — can live on a single kelp plant, and that’s not including the fish, birds and mammals that depend on the whole kelp forest.

Kelps help alleviate climate change. They rapidly take up vast amounts of carbon dioxide from the atmosphere — up to 4,300 metric tons per square kilometer of kelp forest each year. This is critical for climate change mitigation because in addition to reducing how much carbon dioxide we emit into the air, we must also ramp up processes that capture and store carbon dioxide. Kelp forests can even help protect our coastlines from storms that are intensifying in the changing climate by slowing down waves and reducing coastal erosion.

Losing these seaweeds could greatly impact our economy and the way we live. Kelp forests support marine food webs and valuable recreational and commercial fisheries that supply a broad range of products including food and chemical compounds. Kelp is used widely as emulsifiers and bonding agents in things like pills, toothpaste, ice cream, chicken nuggets and even beer (to make the foam stiffer).

It is difficult to put an accurate monetary value on just how much these ecosystem services are worth. In the case of California, after the kelp forests disappeared, the state had to temporarily suspend recreational fishing of red abalone because the sea snails, which rely on kelp, were dying off. A reported 31,000 people visit the red abalone fisheries every year, generating \$44 million in revenue to local communities. [Estimates](#) from Australia

suggest an even larger impact. The kelp-dominated Great Southern Reef contributes as much as \$10 billion to the country's economy each year, almost twice as much as the Great Barrier Reef.

We can help the kelp. Our kelp forests are changing in response to anthropogenic climate change. Large-scale [declines](#) in kelp due to ocean warming are predicted for the coming decades. In most places where kelp forests are lost, they are not being replaced by equivalent habitats but by sediment-laden carpets of small algae. Habitat complexity and ecological functions are lost in these flattened seascapes.

It goes without saying that we need to reduce our greenhouse gas emissions, above all else, if we are going to reverse the decline of kelps over the long-term. In the meantime, we can help our kelp forests by relieving additional threats, including protecting sea otters and large fish that eat kelp grazers like the purple sea urchin. We can reduce agricultural runoff and nutrient pollution in coastal ecosystems that fuel unwanted types of fast-growing algae. And finally, we need to invest in research to understand how to boost the resilience of existing kelp forests and restore those that have already disappeared.

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