

# Kelp Forests

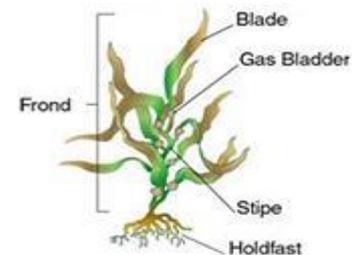


## Why is this Live Dive called Emerald Forests?

We will be diving in a place where there are many animals and organisms living amongst tall forests of kelp. All this different kind of life, including phytoplankton, which are microscopic organisms, make the water appear green. These emerald forests are home to incredible marine life that we can explore together.

## What is kelp?

Kelp is a marine plant that is a type of algae. There are three groups of marine algae, that are grouped by colour: brown algae (*Phylum Phaeophyta*), green algae (*Phylum Chlorophyta*) and red algae (*Phylum Rhodophyta*). Many types of large kelp form “forests” in the sea that provide habitat and nutrients for many different animals. British Columbia is home to a number of species of kelp, including the iconic bull kelp (*Nereocystis luetkeana*).



## What are some characteristics of bull kelp?



What makes bull kelp distinctive is its whip-like appearance, large round float (pneumatocyst), and height. It is a giant amongst kelp, and can reach grow to 24m or 78ft (about as long as the world’s biggest whale, the blue whale!) The main structures of kelp consist of a holdfast, stipe, and blades (or fronds). The purpose of the holdfast is to anchor the kelp to the bottom; it doesn’t absorb nutrients as a land plant’s roots do. The stipe is similar to a plant’s

stem, though simpler; it delivers the sugars of photosynthesis from the blades to lower portions of the kelp. The leaf-like fronds grow at or near the surface of the water, where they use the energy of the sun to make the sugars and amino acids necessary for survival.

## Why are kelp forests important?

Kelp forests are among the most diverse and productive ecosystems in the world as they create nursery grounds for juvenile fish, gardens for grazing limpets and sea

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urchins, and buffets for sea otters, seals and people. Over 150 different species have been recorded living among kelp holdfasts alone!

Kelp forests also protect coastlines by dampening the energy of waves and currents, which reduces coastal erosion. The kelp also makes it easier boat, kayak, swim or dive!

## Why are kelp forests important to me?

People rely on kelp forests in surprising ways - brushed your teeth lately? You probably used some kelp the last time you brushed! Maybe you just associate kelp with sushi, but kelp has had a lot of uses of the years.

The first time people used kelp was during World War I, to make gunpowder. Now, the blades of kelp are utilized to make a thickening agent called algin or alginate. Carageenan is also from algae, particularly red and purple ones. It's used in foods (like ice cream and chocolate milk, and it is even used in some thick beers), in medicine, for fertilizer, for fireproofing fabrics, and is even being explored as an alternative energy source.

If you enjoy eating seafood like salmon, kelp forests are important to you too. A lot of the seafood that comes from the Pacific northwest relies on kelp as a place to grow up and feed. Do you like sea otters? Kelp is a particularly important home for them too. Not to mention, diving and kayaking is also fun in kelp forests as well.



Also - take a big, deep, breath. It's estimated that at least half of every breath we take (and sometimes as much as 85% of it) comes from the ocean, including from vast, tall kelp forests like those found in the Pacific northwest.

## What threatens kelp?

Changes in the food web of kelp forests have threatened kelp forests in the past. Removal of sea otters over 100 years ago caused sea urchins to "clear-cut" huge areas of kelp forests. Normally, predators like the sea otter keep urchin populations in check. However, in the 1800s and early 1900's, sea otters were hunted extensively, and in 1910 they were on the brink of extinction. This resulted in a significant loss of kelp forests and the fish and animals that live in them. Sea otters were protected in 1911, and populations began recovering. In British Columbia, there were 89 sea otters in 1972, but there are well over 6,800 off the coast today!

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Kelp is sensitive to changes in nutrients and light. Excessive sediment, resulting from development or logging in the watershed, can increase the turbidity of the water. This may result in less light penetration so that kelp cannot grow.

Temperature fluctuations such as El Niño have also been known to cause kelp deforestation when warm waters intrude in normally cool areas. Global climate change could affect the distribution and population of kelp beds and affect the food webs within them.

## What can I do?

What you're doing right now! Learn more about kelp and how it's important! Understanding these important areas helps us to better protect them. Tell your friends and family something you've learned about kelp and kelp forests today, and see what else you might learn when you talk to them, do they know something cool or important about kelp too?

Other things we can do is learn where our seafood comes from, and learn if it was fished in a way that keeps kelp forests healthy. And every time you ride your bike, walk, or bus instead of drive, you help keep our entire planet, including kelp forests, healthier too!