

Kelp Forest Group

Read the attached information about kelp forests. You must put together a presentation at least 2 minutes in length on kelp forests. In your presentation you should include:

- Where in the world kelp can be found
- Describe the environment that kelp grows in
- Define kelp
- Provide some uses of kelp
- Anything else you think is important.

By the end of your presentation, the class should be able to answer these questions:

- What are kelp forests found?
- What is kelp?
- In what environment do kelp grow?
- Why does kelp not float away in the ocean?

Off the coast, beyond the crashing surf, where the ebb and flow of the ocean currents bathe shallow reefs, sways the majestic kelp.

Forest Kelp occurs along coastlines that have an upwelling of cool, nutrient-rich waters, with temperatures usually 68 degrees Fahrenheit. Dense stands of these brown algae are called kelp forests. These beautiful and biologically productive habitats are found in shallow, sunlit waters—usually less than 30 meters deep – from the Arctic to the Antarctic Circles.

The bull kelp, scientifically known as *Nereocystis*, is one of the largest and fastest growing kelps in the world, attaining astonishing growth rates of up to 10 inches a day. Bull kelp typically reach lengths of 60 feet or more in a lifespan of 1–2 years.

The kelp plant is "anchored" to the seafloor by a root-like structure called a holdfast. At the top of the holdfast grow stem-like stipes. These reach toward the surface with the help of a hollow bulb, called a pneumatocyst. At the tip of the bulb are fronds, the function of which is to absorb nutrients directly from the water column and gather light energy for photosynthesis. At the surface, the fronds continue to grow, forming a dense canopy.

The canopy is teeming with juvenile fish and invertebrate larvae, which in turn may feed seabirds such as the marbled murrelet, a threatened species along the Pacific Northwest coast. Other predators in the kelp forest include the sea urchin. Population explosions of the herbivorous urchin can decimate a kelp forest. At the top of the complex kelp forest food web is the sea otter, which can help control the urchin numbers.

Native Americans had many uses for kelp, including medicine, food, salt, and fishing gear. Modern day uses include the extraction of algin, which is used in everyday products such as paints, synthetics, pharmaceuticals, rubbers, beer and toothpaste.

Kelp forests are a type of marine ecosystem that is present around colonies of kelp; they contain rich biodiversity. Kelp can stretch 2–30 meters or more (up to 60 m in *Macrocystis pyrifera*) from their anchors on the sea floor to the surface. It provides a vertical infrastructure that is home to many fish and invertebrate species. Kelp forests also often attract mammalian visitors, including whales, sea lions, sea otters, and SCUBA-diving humans.

Kelp forests draw their name from an analogy to forests on land.

Kelp is a type of seaweed. It is in the same group as the brown algae. There are many different kinds of kelp. Kelp grow in large forests, usually near the surface of the water. Some kelps grow very fast (up to 30 cm a day). Kelp can reach a length of up to 60 m. It is usually eaten as a vegetable.

Environmental Characteristics

Kelp forests are found in temperate ocean waters around the globe wherever water conditions are conducive to the successful establishment of kelp colonies. Kelp favors clear waters between about 4 and 20 degrees Celsius; various species of kelp favor different ranges of temperatures, but none grow in waters where the temperature is consistently warm.

Kelp forests are typically found in waters between 1 and 24 meters below the low tide mark; the tops are often partially exposed on very low spring tides, with the tops of the kelp sticking 20 to 30 cm out of the water. Water clarity is a key factor determining the depth of water a kelp forest can thrive in, as sufficient light must reach the depth where kelp are anchored to the sea floor and first start to grow.

A high nutrient content (for example at an upwelling), moderate water movement via wave action or current, and a hard base for attachment are also all necessary requirements for the establishment of a kelp forest.

Major kelp forests can be found in both the Northern and Southern hemispheres, along the coasts of western Europe, northeast Asia, western North America (from southern California to Alaska), South Africa, southern Australia, and the west coast of South America.