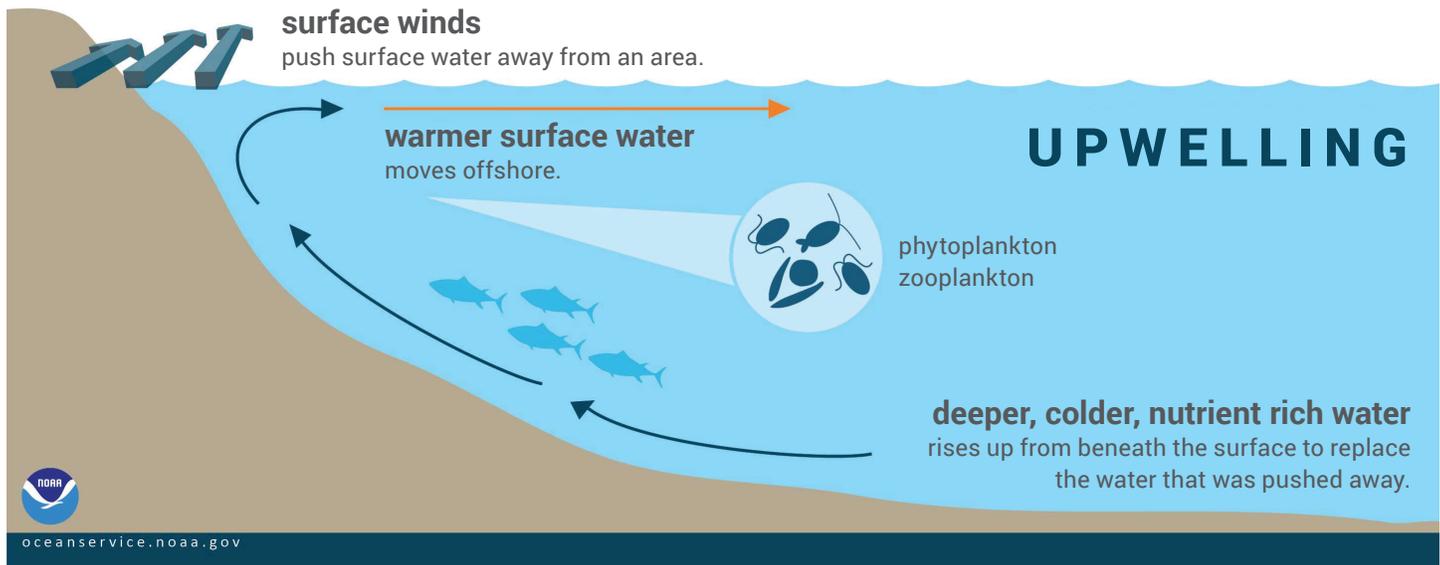




What is Upwelling?

Upwelling is a process in which **deep, cold water rises** toward the surface.



This graphic shows how displaced surface waters are replaced by cold, nutrient-rich water that “wells up” from below. Conditions are optimal for upwelling along the coast when winds blow along the shore.

Winds blowing across the ocean surface push water away. Water then rises up from beneath the surface to replace the water that was pushed away. This process is known as “upwelling.”

Water that rises to the surface as a result of upwelling is typically colder and is rich in nutrients. These nutrients “fertilize” surface waters often leading to high biological productivity. This can include an increase in the growth of plant life, including phytoplankton which serve as the ultimate energy base in the ocean for large animal populations higher in the food chain - providing food for fish, marine mammals, seabirds, and other critters.

Coastal upwelling ecosystems, such as those along the west coast of the United States, are some of the most productive ecosystems in the world and support many of the world’s most important fisheries. Although coastal upwelling regions account for only one percent of the ocean surface, they contribute roughly 50 percent of the world’s fisheries landings.

Upwelling can also play an important role in the movement of marine animals. Most marine fish and invertebrates produce microscopic larvae which, depending on the species, may drift in the water for weeks or months as they develop. For adult marine creatures that live in shallow waters nearshore, upwelling that moves surface water offshore can potentially move drifting larvae long distances away from their natural habitat, thus reducing chances for survival.

In some ways, upwelling can be a mixed blessing to coastal ecosystems. It can infuse coastal waters with critical nutrients that fuel dramatic productivity, but it can also rob coastal ecosystems of offspring required to replenish coastal populations.

