

Welcome to the *Natural Inquirer*Monographs—Carbon Series! A
monograph is a single research
article organized into a booklet.
This monograph series will focus on
carbon. Carbon is an important part of
our world. Carbon is an element that
can be found in water, soil, plants,
animals, and the atmosphere. In fact,
about 18 percent of the human body
is carbon!

Humans and other animals get carbon from eating plants and from

eating animals that eat plants. A plant contains carbon as long as it lives and until it completely decays or is burned. Plants get carbon by taking in carbon dioxide (CO<sub>2</sub>). When the plant takes in CO<sub>2</sub>, it keeps the carbon and releases the oxygen. Another place that carbon is held is in the water. For example, carbon that is held in ocean water and coastal forests is known as blue carbon. This blue carbon is held in areas such as salt marshes, sea grasses, and mangroves (figure 1).

To learn more about monographs, read "About *Natural Inquirer* Monographs!" on page 5.

All places that hold carbon on Earth are known as carbon sinks. Carbon sinks are important to understand because too much carbon in the atmosphere contributes to climate change. Therefore, understanding how carbon sinks work and where they are located can help with adaptation and mitigation strategies for a changing climate.

With all this discussion about where and how carbon is stored, you may be wondering how carbon gets released back into the atmosphere. A natural release of carbon into the atmosphere comes from wildland fires (figure 2).

Another way carbon is released back to the atmosphere is through the burning of fossil fuels. Fossil fuels are oil, coal, and natural gas. Fossil fuels are made from the chemical remains of dead plants and animals. When fossil fuels are burned, they release mainly heat, water, and carbon dioxide. This process of carbon cycling through different locations on Earth and in the atmosphere is called the carbon cycle (figure 3).

Because carbon is so **pervasive** and important in the environment, many scientific studies are conducted to help understand the role that carbon



Figure 1. Sea grasses store blue carbon. Photo by Babs McDonald.

plays in our world. For example, some studies have been done on carbon sequestration (sē kwə strā shən). Carbon sequestration refers to the ability of some areas to keep carbon in a solid or liquid form instead of releasing the carbon back into the atmosphere. As noted earlier, these areas that hold carbon are called carbon sinks.

In this second monograph of the Carbon Series, you will examine the relationship between the red-cockaded woodpecker, longleaf pine, fire, and carbon. You will learn how these systems are interconnected and that there are trade-offs among these things that need to be considered when managing the land.



Figure 2. Carbon is naturally released into the atmosphere when wildland fires occur.

USDA Forest Service photo.

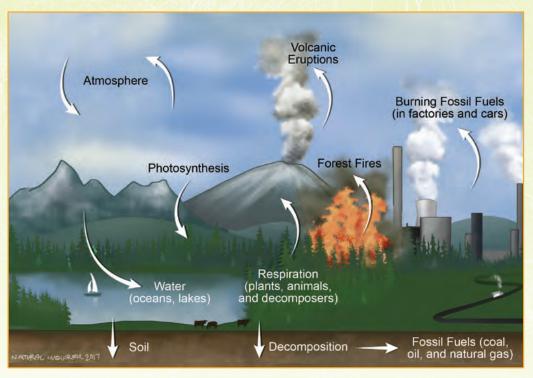


Figure 3.
The carbon cycle.

Illustration by Stephanie Pfeiffer.