

Climate Change – Fast Carbon Slow Carbon

A banana and a chunk of coal both store carbon, yet they are as different as can be. The banana is sweet and delicious, the coal is... not [0:16]. Both were made by plants and store energy from the sun and carbon gas from the air. The carbon in the banana is young and fast, while carbon in the coal is old and slow.

NASA launches satellites into Earth orbit to help us watch fast and slow carbon cycling. Higher amounts of carbon dioxide in the air are shown in yellow. Growing plants on land are shown in green. Plants use the sun's energy to remove carbon dioxide from the air to make biomass, such as the banana. Growing plants remove carbon dioxide from the air in spring and summer. In winter, all living things release carbon dioxide back into the air. Some carbon cycles quickly, moving through living things and returning to the atmosphere. Carbon in the banana is young fast carbon. Just weeks ago, the banana was carbon gas in the air. Hours after you eat it, you breathe out the same carbon, back into the air around you.

Other carbon cycles slowly, getting buried underground or deep in the ocean. Plants took the coal carbon out of the air hundreds of millions of years ago, long before there were people. That carbon has been locked up ever since and would stay locked up if we did not dig it up and burn it. We use coal and other fossil fuels to power our lights and factories, heat our homes, and move around. When this old carbon is burned, we release carbon gas to the air and can also release black carbon or soot, here shown in purple over the Earth at night, brightest where most carbon is released.

Black carbon in the northern hemisphere comes mainly from coal and forest fires. In South America, Africa, and Indonesia, it comes from burning fields and forests that may have stored carbon for hundreds of years. The carbon cycle is balanced if carbon released into the air is the same as what is taken up by the ocean and land. But lately people have been putting old slow carbon into the air faster than nature can cycle it back into storage.

Why do we care about the carbon cycle? Carbon dioxide acts like a blanket and traps heat leaving the Earth's surface. Too much carbon dioxide in the atmosphere warms the Earth and leads to other changes, such as melting ice caps and rising sea level.

Each of us has a carbon footprint – the amount of carbon we put into the air through the choices we make about food, transportation, and energy.

Find out what you can do to reduce your carbon footprint today.