Climate Change: Atmospheric Carbon Dioxide

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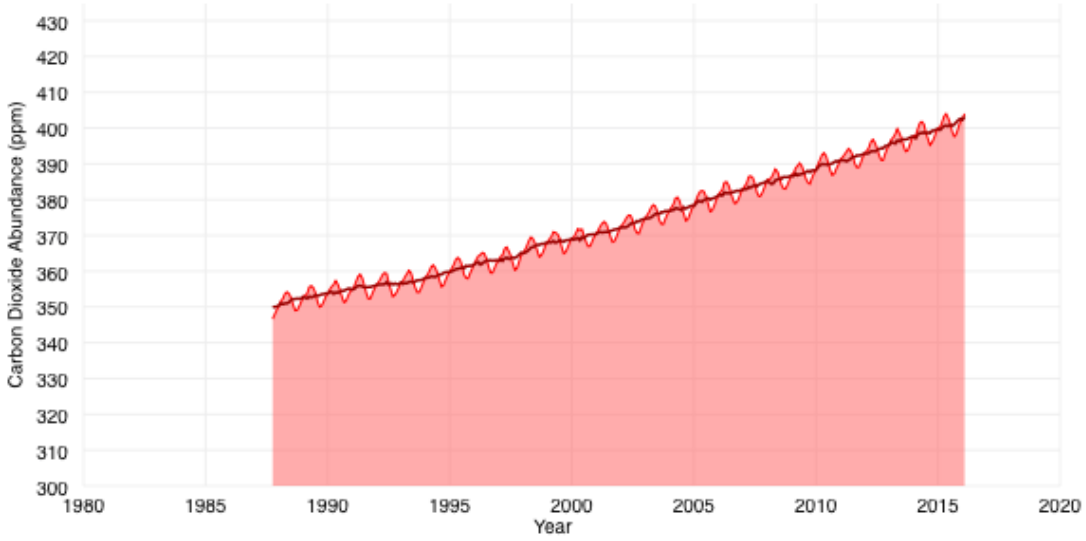
Carbon dioxide gets a lot of coverage in the news these days, increasingly attracting the attention of government leaders in the United States and around the world. Not bad for a gas you can't see or smell... Why so much buzz?

Carbon dioxide belongs to a category of gases known as "greenhouse gases." These gases absorb warmth from their surroundings and re-radiate some of it back toward Earth's surface, slowing the rate at which the planet loses heat. This "greenhouse effect" is nothing new: plants and animals have enjoyed the benefits of its warming influence for billions of years. Without the greenhouse effect, Earth's average temperature would fall below freezing. However, human activities are now increasing the concentration of carbon dioxide in our atmosphere, amplifying the natural warming caused by the greenhouse effect.

During the Industrial Revolution, humans began burning coal, natural gas, and oil to power machines for manufacturing and transportation. Since then, we have burned more fossil fuels each decade, releasing vast amounts of carbon dioxide that were previously stored in the ground into the atmosphere. Before the Industrial Revolution, the atmospheric concentration of carbon dioxide was about 280 parts per million (ppm). When continuous observations began at Mauna Loa in 1958, carbon dioxide concentration was roughly 315 ppm. On May 9, 2013, the daily average concentration of carbon dioxide measured at Mauna Loa surpassed 400 parts per million for the first time on record.

The vast majority of climate scientists are concerned that the dramatic rise in carbon dioxide is causing the planet to warm. Likely consequences of global warming include sea level rise, shifting precipitation patterns, expansion of areas affected by drought, increasing numbers of severe heat waves, and more intense precipitation events.



The graph shows atmospheric carbon dioxide abundance measured at NOAA's Mauna Loa Observatory on Hawai'i. Abundance is shown in parts per million (ppm); values show the number of molecules of carbon dioxide per million molecules of dry air. The bright red line shows monthly measurements-its regular up-and-down pattern reflects seasonal changes in plant growth. The dark red line shows the annual trend, calculated as the average value for the previous 12 months.

Scientists are also concerned about the fact that carbon dioxide absorbed by the ocean from the atmosphere is increasing the acidity of seawater. This change in ocean chemistry interferes with the ability of marine plants and animals to build their shells, ultimately threatening a reorganization of the entire marine food chain, which could lead to a mass extinction event.

The good news is that we know how to slow our rate of carbon dioxide emission. Key questions remaining are: Will we choose to address the carbon dioxide problem? What will the costs be, and who will pay them?

Source: National Oceanic and Atmospheric Administration (NOAA)

https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide