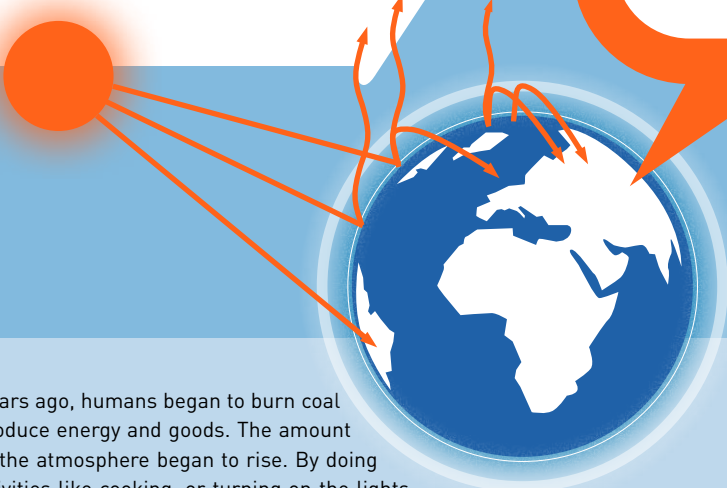


Science

There are three numbers you need to really understand global warming, **275**, **389**, and **350**. For all of human history until about 300 years ago, our atmosphere contained **275** parts per million (ppm) of carbon dioxide. That's a useful amount—without some CO₂ and other greenhouse gases that trap heat in our atmosphere, our planet would be too cold for life on Earth.

350

Climate Change Science Basics from 350.org



About 300 years ago, humans began to burn coal and oil to produce energy and goods. The amount of carbon in the atmosphere began to rise. By doing everyday activities like cooking, or turning on the lights, we're taking millions of years worth of carbon, stored beneath the earth as fossil fuels, and releasing it into the air. At the same time, we're changing the way we use our land, cutting down trees and tilling our farmland, which also adds CO₂ to our atmosphere.

By now—and this is the second number—the planet has **389** parts per million CO₂ – and this number is rising by about 2 ppm every year.

Parts per million (ppm)

The concentration of CO₂ in our atmosphere is measured in "parts per million", which simply means a ratio of CO₂ molecules per million molecules in our atmosphere. There's currently 389 parts per million (ppm) in the atmosphere. 389ppm may sound like a small amount, but our atmosphere is so finely tuned that changing this concentration just a little bit can disrupt our entire planet.

Climate Change Impacts

In the last few years, it's become clear that the rise of CO₂ in our atmosphere is having an effect much faster and more severely than scientists once predicted. Here are a few examples of impacts we're already seeing:

Oceans are Acidifying:
Warmer and more acidic oceans are killing a vast amount of the world's coral reefs.

CO₂

Glaciers are Melting:
They're disappearing fast— and glaciers are the only source of drinking water for hundreds of millions of people.

CO₂

Sea Levels are Rising:
Scientists warn they could go up several meters this century, threatening the homes of hundreds of millions of people.

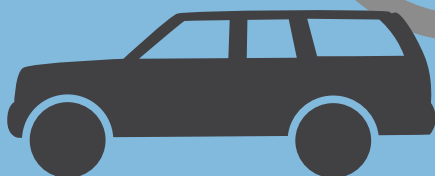
CO₂

Mosquitoes are Spreading:
They're thriving in new places, and are bringing malaria and dengue fever with them.

CO₂

Weather is More Severe:
Hurricanes, typhoons, and droughts are becoming more frequent, harsher, and unpredictable.

CO₂



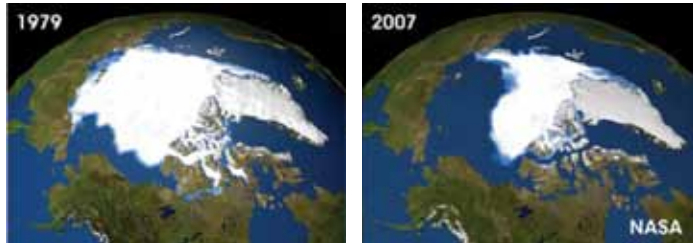
CO₂

CO₂

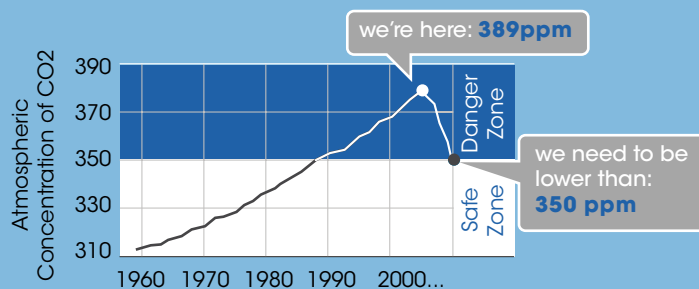


Impacts are speeding up

The Arctic is sending us the clearest message that climate change is happening now, and much faster than scientists once thought. In the summer of 2007, the extent of Arctic sea ice decreased by nearly 40%. It is melting so fast that scientists now believe the Arctic could have no ice in the summertime as early as 2013, which is 80 years ahead of what had been predicted just a few years ago.



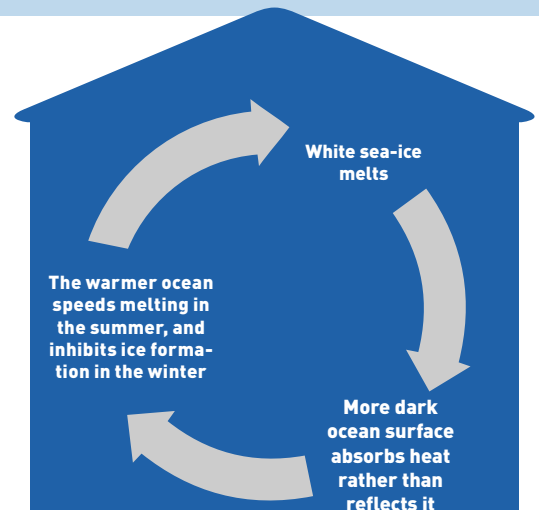
350ppm: The safe level of CO2 for our atmosphere



350 parts per million is the third and final number to remember, and it represents the safety zone for planet Earth. Above 350ppm we risk reaching dangerous 'tipping points' (see box). We don't know how long we can stay above 350ppm - this number is far outside the range we've seen in our recorded history - but we do know that the smart thing would be get back to the safety zone as soon as possible.

"If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO2 will need to be reduced from its current 389 ppm to at most 350 ppm."

— Dr. James Hansen, NASA



Feedback loop example: the Albedo effect in the Arctic

What's a 'Climate tipping point'?

This means a point in time when the earth's climate begins to change in ways we can't undo in our lifetimes - or possibly for many, many generations. Tipping points are fed by impacts that reinforce each other, called 'feedback loops'. For example, as Arctic sea ice melts, the darker ocean absorbs more sunlight, becomes warmer, and speeds melting. An example of a tipping point, is the potential melting of the Greenland or Antarctic ice sheet. These are dangerous events that we must avoid by getting below 350ppm as soon as possible.

350ppm is a new, and very important, piece of scientific information. With your help, we can spread this news about the safety of our planet to our fellow citizens, communities, countries, and the world. Take action in your community on 24 October, the 350 International Day of Climate Action, to help educate your community and the world about the importance of getting our planet back to 350ppm. See below for ideas for educating your community about climate change!



TAKE ACTION

Action ideas to educate your community about climate change

- Give a presentation (see 350.org for a power-point) at a local school
- Hold a teach-in at a university and invite local experts to speak
- Screen a documentary about climate change

350.org is an international climate change campaign calling for a fair Copenhagen climate treaty that meets the latest science. 350ppm represents the safe upper limit of CO2 in our atmosphere. Take part in your community on 24 October, 2009: An International Day of Climate Action. Visit www.350.org to get involved.

www.350.org
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