

The Anthropocene

The **Anthropocene** is what some people have suggested renaming our modern era—a time where human activities have been shaping the planet more than almost any other force. Of course, it was not always so; keep in mind that we are a very young species. Stepping back even further, recall that the earliest life forms on earth were living in an anoxic environment, one with no free oxygen in the atmosphere. The original environment of our planet was inhospitable to most life as we know it. That is, until the evolution of a new kind of single-celled organism that produced oxygen as a by-product of photosynthesis. Just recently, we have discovered that this ability of the cyanobacteria appears to have evolved through horizontal transfer. Where multicellular, sexually reproducing organisms transfer their genes vertically, from parent to offspring, organisms in the past were swapping genetic material laterally (from organism to organism), just like many germs today. Changes in ancient life forms affected the atmosphere, creating oxygen, which then affected the entire range of possible life.



Above left: Bleaching of the Great Barrier Reef. Coral bleaching is caused by rising temperatures in the ocean; the ocean absorbs most of the heat resulting from climate change. Above right: Clear-cutting of Amazonian forest. Most deforestation world-wide is due to agriculture.

In this new era of rapid change, humans are changing the world in many irreversible ways. Populations increasing fuel the demand for more resources. Increases in technology utilize more

types of resources. Many of these changes have rapidly accelerated over the last few hundred years or less. The amounts of carbon dioxide and methane in the atmosphere have risen drastically since the Industrial Revolution. Species extinction is on the rise—some call this era the “Sixth Extinction” due to human activity. Half of the world’s mature tropical forests are now gone. We are a voracious species, consuming at an alarming rate. When we push against nature, though, it sometimes pushes back.

Why do there seem to be more and more “killer viruses” emerging? No, they are not lab-grown! Please read this [brief article](http://www.npr.org/sections/goatsandsoda/2017/02/14/511227050/why-killer-viruses-are-on-the-rise) [_ \(http://www.npr.org/sections/goatsandsoda/2017/02/14/511227050/why-killer-viruses-are-on-the-rise\)](http://www.npr.org/sections/goatsandsoda/2017/02/14/511227050/why-killer-viruses-are-on-the-rise): it illustrates that many of these diseases were there all the time. There is no conspiracy. But humans have been taking over more and more land, pushing out the wild animals. And scientists around the world have been looking specifically at the different animal species that are most likely to carry viruses that may be transmitted to humans. For example, The Veterinary School of Medicine at UC Davis has been researching Emergent Pandemic Threats for over a decade through its [PREDICT](https://ohi.vetmed.ucdavis.edu/programs-projects/predict-project) [_ \(https://ohi.vetmed.ucdavis.edu/programs-projects/predict-project\)](https://ohi.vetmed.ucdavis.edu/programs-projects/predict-project) project (link optional).

We do know that changes in the environment affect the species that live in the environment. More fundamentally, changes in the atmosphere have a profound effect on the possibilities of life. And as changes in the atmosphere in the past created a radically different planet, we are now changing the atmosphere ourselves. Are we willing to apply scientific knowledge, including that of the past, to our understanding of the world today? What will the Anthropocene continue to look like in the future? The earth’s history has been full of change, but changes today are unparalleled. Our species survived and thrived by becoming adaptable. What will future humanity look like? What do you want it to look like?



The dodo bird was hunted to extinction in the late 17th century. The thylacine, also known as the Tasmanian tiger or wolf (it was a marsupial carnivore) went extinct in the early 20th century.