

# Collision Course

Humans have been on the Earth for only about three million years, a blink of the eye on the geologic time scale. Recently, about two hundred years ago to the present, humans have altered and changed the planet faster than ever before.

While the population of humans has grown exponentially, resources of the Earth have been used and irreversibly damaged. The United Nations estimates that the Earth's population will be 11.6 billion in 2200, but other estimates put the population at 19 billion in 2200. Can the Earth realistically support any more people?

Within the past century, the global temperature has already risen one degree Celsius due to the increasing amount of carbon dioxide and other gases in our atmosphere. These excess gases capture and hold heat in, after it bounces off our planet. Without these gases, our planet would be frozen rock with an average temperature of about negative eighteen degree Celsius. Therefore, some amount of these gases is good. However, if the concentration of these gases continues to rise, more and more heat will be trapped within the atmosphere, and the worldwide temperature will continue to rise. This rise in temperature will cause sea levels to rise, which will completely wipe out a number of low-lying island nations and flood many coastal cities. In addition, many plant and animals species will be driven into extinction, agricultural regions will be disrupted, and the frequency of severe hurricanes and droughts will increase.

In the 1970's, scientists discovered that the ozone layer was being attacked by chlorofluorocarbons (CFCs). CFCs were and still are in developing countries, used widely in refrigeration, air-conditioning systems, cleaning solvents, and aerosols sprays. CFCs are created artificially by fusing a molecule

of chlorine, fluorine, and carbon together. When one CFC molecule is released into the atmosphere, the sun's ultraviolet light causes the chlorine atom to break off. Then this free-floating atom bonds with ozone molecules ( $O_3$ ) and breaks them into the oxygen that we breathe ( $O_2$ ), destroying the ozone layer. Because this process does not affect chlorine, each chlorine atom has the potential ability to destroy large amounts of the ozone for extended periods of time. With a thinner ozone layer, increased ultraviolet radiation would lead to a growing number of skin cancers and cataracts, and reduce the ability of people's immune systems to respond to infection. In addition, the growth rates of plankton would decline affecting the marine food chain, and the amount of oxygen produced through photosynthesis.

Humans have also altered the atmosphere. A large portion of industry and transportation are based on the burning of fossil fuels, such as gasoline, coal, petroleum, and natural gas. As these fuels are burned, chemicals are released into the atmosphere. Most air pollution consists of carbon, sulfur, and nitrogen. These chemicals interact with one another and with ultraviolet radiation in very dangerous ways. Smog forms when nitrogen oxides react with hydrocarbons in the air to produce aldehydes and ketones. Smog can cause serious health problems. Sulfur dioxide and nitrous oxide are transformed into sulfuric acid and nitric acid respectively in the atmosphere, which precipitate down as acid rain. Few species are capable of surviving such acidic conditions. Acid rain has caused several lakes to not be able to support fish populations.

While humans have been on Earth, they have also polluted the water. Estimates suggest that nearly 1.5 billion people lack safe drinking water and that at least five billion deaths per year can be attributed to waterborne diseases. Water pollution comes from both point and non-point sources. Point sources are exact points where pollution is discharged directly into the water. Factories, sewage treatment plants, and oil tankers are all examples of point sources. A nonpoint source is runoff water containing pesticides and fertilizers. Nonpoint sources are harder to regulate and control. Most water pollution is from nonpoint

sources. With almost eighty percent of the planet covered by oceans, people have long acted as if the oceans could serve as a limitless dumping ground. The dumping of raw sewage, garbage, and oil spills has caused many coastal regions to become polluted.

Lastly, humans have driven many plant and animal species into extinction, and many more into the danger of extinction. Species are dying out at an alarming rate. Estimates suggest that four thousand to fifty thousand species are wiped out each year. The leading cause of extinction is habitat destruction. At the current rate that the rainforests are being cut down, they may completely disappear by the year 2030. Since European colonization, North America has been transformed tremendously. About ninety-eight percent of tall-grass prairies, fifty percent of wetlands, and ninety-eight percent of old-growth forests have been destroyed. This loss is critical! As habitats are destroyed and species become extinct, the world is losing threads from the interconnected fabric of life.

As you can see, the planet Earth has been changing faster than ever before. If something is not done soon, the planet will undergo massive changes. A document released in November of 1992 by scientists around the world and the United Nations Educational, Scientific, and Cultural Organization stated, “human beings and the natural world are on a collision course,” which “may so alter the living world that it will be unable to sustain life in the manner that we know.”

By Scott

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