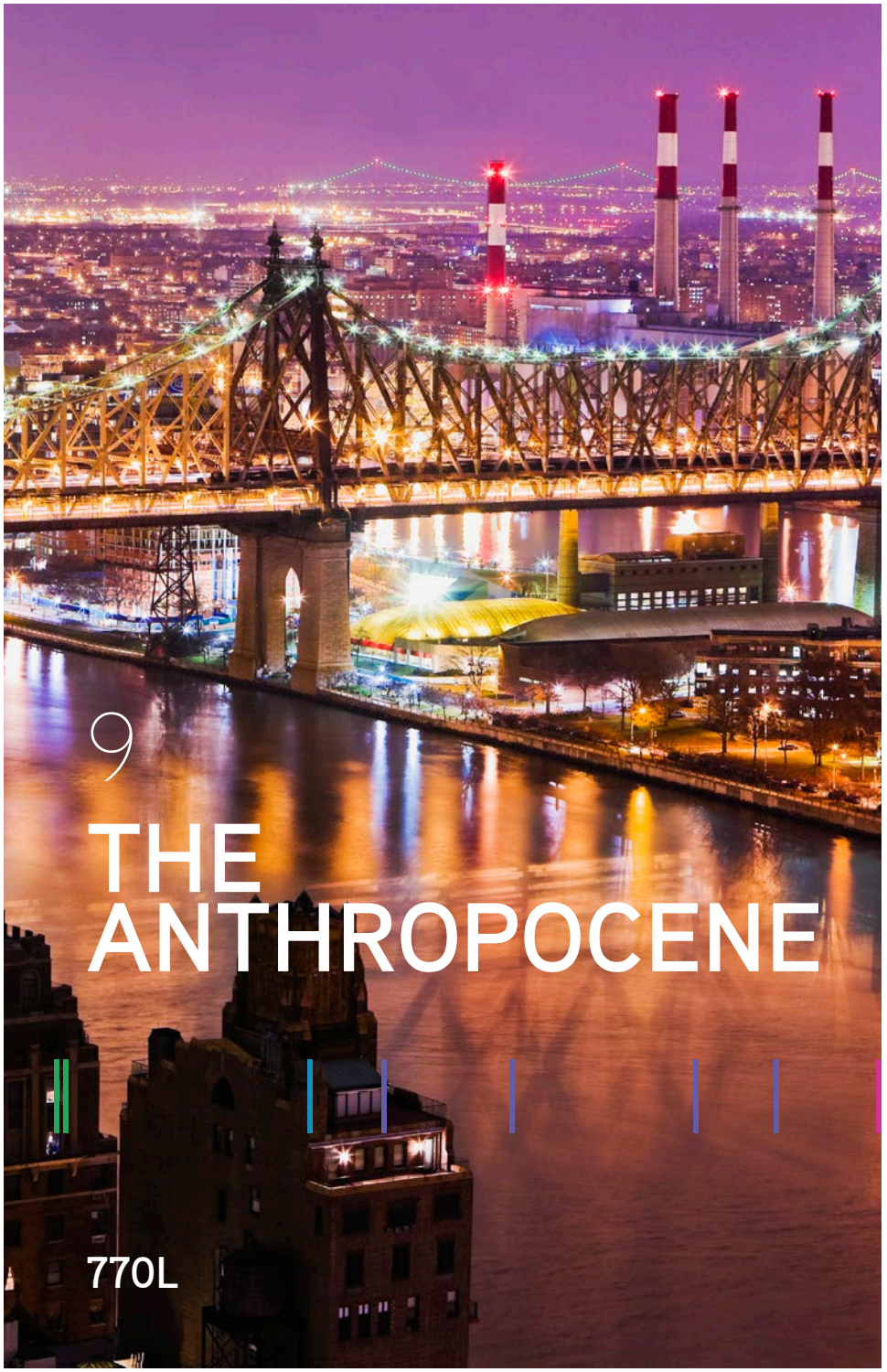

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THE ANTHROPOCENE

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BIG HISTORY PROJECT

THE ANTHROPOCENE

A NEW GEOLOGIC EPOCH?

By Cynthia Stokes Brown, adapted by Newsela

For the first time in the history of life on Earth, a single species, humans, has the ability to change the entire biosphere.

The case for the Anthropocene

Geologists have a system for naming large chunks of Earth's time. Thousands of years are called "epochs." Tens of millions of years are "periods." Hundreds of millions of years are "eras." The longest measurements of time are called "eons."

Our current epoch is the Holocene. It started 10,000 years ago, after the last ice age. The word Holocene comes from Greek roots: *holo* for "whole" and *cene* for "new." Hence, Holocene means "wholly new."

In 2000, a prominent chemist argued that we have entered a new epoch of human domination over the planet. The new epoch is called the "Anthropocene." A*nthropo* is the Greek root for "human."

The name Anthropocene has not been officially adopted, but many geologists are using it.

Evidence of change

How do we know that humans have begun to dominate and alter our planet? The clearest answer is a familiar one: climate change.

Plants and animals are moving northward. Glaciers are melting. Storms and droughts are getting more severe. Weather patterns are changing. Scientists have been able to explain these phenomena by tracking the Earth's atmosphere over time.

A small part of Earth's atmosphere is made up of "greenhouse gases." These gases hold in heat reflected from Earth and do not let it escape into space. One of these greenhouse gases is carbon dioxide (CO_2).

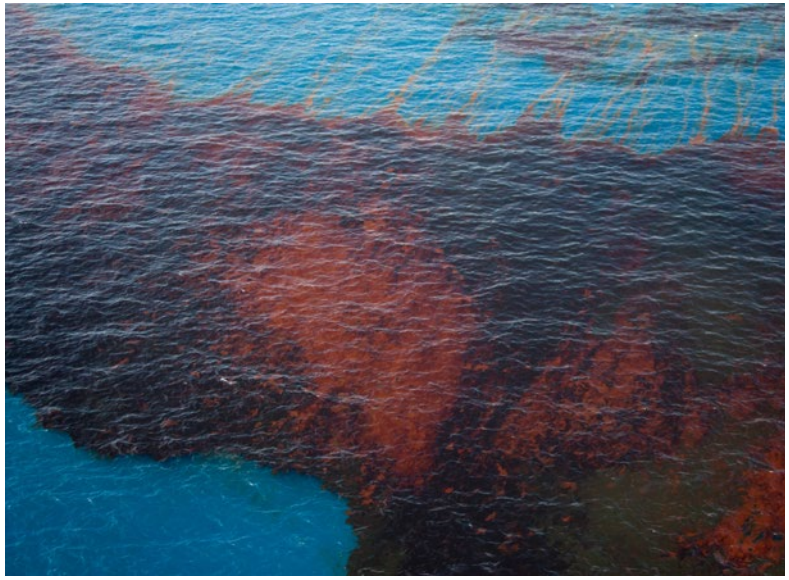
During the past million years, CO_2 in our atmosphere ranged from 180 parts per million (ppm) to 280 ppm. This was not affected by humans.

But since humans began to farm, the CO_2 in our atmosphere has risen from 280 ppm to 390 ppm. This rise happened much faster than ever before. It was caused by humans burning fossil fuels over the last 250 years.

Leading scientists now say that we must reduce the concentration of CO_2 to 350 ppm. To do this, humans must release about five percent less CO_2 every year until 2050. If we don't do this, our climate could warm, with terrible consequences.

But CO_2 emissions are increasing. In 2011, they went up by almost 6 percent. China produced 24.6 of the total. The United States produced 16.4 percent.

CO_2 emissions don't just affect the atmosphere. They have changed the chemistry of the oceans as well. The oceans are absorbing extra CO2. This makes the water more acidic. Creatures that form calcium shells have trouble in acidic water. Runoff from fertilizers and pesticides further pollutes the oceans, causing rapid increases of harmful algae. Widespread overfishing threatens marine species worldwide.



Oil from a spill in the Gulf of Mexico

More than just sea life is at risk. The biodiversity all over the planet is declining faster than usual. The present rate of decline is between a hundred and a thousand times the usual rate. Up to half of all species face extinction in the twenty-first century. Many biologists believe the current extinction will rank as one of Earth's six major ones.

Humans are also changing the Earth through our creation and use of artificial chemicals. Drugs. Pesticides. Plastics. Synthetic fabrics. These chemicals are being absorbed into the Earth. No one knows what effects they will have.

Nuclear energy is a powerful force that humans have developed. The United States dropped two atomic bombs on Japanese cities in 1945 to end World War II. A handful of nations have tested bombs since then. There have been several major accidents at nuclear plants. But so far, nuclear power has not been used destructively on a massive scale.

There are many nuclear weapons today. Some are ready to launch in just 15 minutes. Nuclear war could kill millions of people and produce a "nuclear winter." The consequences could be as serious as the asteroid that wiped out the dinosaurs 65 millions years ago.

The evidence we've discussed comes from biologists and climate scientists. But geologists have a very specific way of determining historical periods. They look for evidence in the rocks. And they examine layers of mud that will become rock. They are finding evidence. Worldwide sediments contain radiation from atomic bomb testing in the 1960s. Similar evidence also exists in ice-core samples.

Environmental historians support the claims of geologists. Scholar John McNeill wrote that the human race has begun a massive uncontrolled experiment on the Earth.

A wind farm in Germany

Going forward

People disagree on what these changes might bring and how humans can deal with them. English scientist James Lovelock believes that humans can no longer control change. He thinks the planet will return itself to a balance. This balance may not support much human life. According to Lovelock, the best we can do is try to adapt to the changes.

Others believe humans are clever enough to find our way out of any difficult situation. We have our collective learning. We can use it to create new ideas, technologies, and solutions. We survived crises in the past. We can survive again.

Geologists continue to debate other questions: When did the Anthropocene begin? How do we know when we have reached the critical point of human influence on the Earth? Considering these questions has allowed scientists to examine change that is happening now.

Meanwhile, people have to face this important period in planetary history. Human decisions made in the near past and those made in the near future will determine the direction of life on our planet.

Many leading scientists and journalists believe that we have at most 10 years to change our destructive behavior and to implement new technologies. Otherwise, humans could face a breakdown in our planet's life-support systems. Many people trust that human cleverness will be able to get us through this decisive period. It will take commitment, innovation, and cooperation from many people to accomplish this.

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