

Before Global Warming, Humans Caused Global Cooling, Study Finds

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When they arrived in the Americas centuries ago, European colonists brought pestilence and death. Their arrival was so devastating, in fact, that it may have contributed to a period of global cooling, according to a new study. The research, to be published in the March issue of the journal *Quaternary Science Reviews*, represents an ambitious attempt to show that, through a series of events, human activity was affecting the climate long before the industrial revolution and global warming.

The authors found that disease and war wiped out 90 percent of the indigenous population in the Americas, or about 55 million people. The earth, they argue, then reclaimed the land that these populations left behind. The new vegetation pulled heat-trapping carbon dioxide from the atmosphere and into the land, contributing to what scientists refer to as the “Little Ice Age.”

“It was a drastic change in the earth’s system,” said Alexander Koch, the study’s lead author and a Ph.D. candidate at the University College London Department of Geography.

The study stemmed from Mr. Koch’s decision about three years ago to wade into a debate in geological science over how to define the start of the Anthropocene, the name for Earth’s most recent, human-dominated time period.

At the time, Mr. Koch was beginning his graduate studies and came across research that had linked a dip in atmospheric carbon dioxide centuries ago to carbon sequestered in the land. If colonization had spurred that dip, as others had hypothesized, then that period would be a good candidate for when the Anthropocene should begin. “I thought that sounds like quite an interesting topic to research,” he said. “It’s quite interdisciplinary.” In the end, Mr. Koch and his colleagues pulled from a wide range of disciplines for the study, synthesizing the latest credible estimates on population, land use, mortality and the carbon uptake of plants and trees throughout the Americas.

Based on 119 regional estimates, the authors concluded that 60.5 million people lived in North and South America before Christopher Columbus arrived in the Bahamas in 1492. By 1600, though, that population had been decimated.

At the same time, carbon stored on land increased and carbon dioxide in the air decreased, supporting the hypothesis that colonization may have been to blame.

But the research isn’t without critics.

Robert Rohde, the lead scientist for the independent climate research group Berkeley Earth, said that while the authors clearly took care to assemble the estimates, the study, and some media coverage of it, overstated the role colonization played in the Little Ice Age. “At best, it explains a portion of part of the Little Ice Age,” he said.

The Little Ice Age was centuries in the making and, he said, other factors like weak solar activity and increased volcanic activity were more likely culprits. (There is disagreement over when the Little Ice Age began and ended, though some say it lasted from about A.D. 1400 to 1900.)

Mr. Koch and his colleagues acknowledged those other factors, which they say accounted for about half of the decrease in atmospheric carbon dioxide. But the other half, they argued, could be accounted for only by a large increase in vegetation caused by the effects of colonization.

In the end, they found that the deaths caused by colonization led to a drop of about 3.5 parts per million of carbon dioxide in the atmosphere. That finding can be instructive, Ms. Perren said. It not only reinforces that human activity can affect the climate, but it also shows that there are natural ways to address the modern global warming problem. “We’re always searching for these great technologies that will do it on a megascale, but the most efficient way you can pull CO₂ out of the atmosphere is with trees,” she said.

Still, the effect that the authors describe pales compared to the toll modern humanity has taken — in the opposite direction. While the cascading effects of colonization reduced atmospheric carbon dioxide by about 3.5 parts per million over more than a century, atmospheric carbon dioxide today is increasing at a rate of about 2.3 parts per million each year, warming the earth.