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Global Warming

“Global warming” is the now commonly used term for the rapid rise in the average temperature of the earth’s surface, including air and ocean, for the past century or more. The increase is widely attributed to the phenomenon known as “the greenhouse effect,” whereby the atmospheric buildup of excess concentrations of carbon dioxide, methane, chlorofluorocarbons, and nitrous oxide—known as greenhouse gases (GHGs)—prevents infrared energy from escaping and traps heat at the earth’s surface. Although there remains a minority of staunch skeptics, global warming is almost universally regarded as a fact in the scientific community and generally linked to human activity, in particular the burning of fossil fuels. In the context of the culture wars, the debate over global warming has centered on the extent of the problem and whether or not a proactive federal response, such as strict but costly regulations and programs that subsidize clean-energy technologies over carbon-based ones, is imminently needed.

The concern over GHGs accumulating in the atmosphere dates to the 1950s. In 1957, the American climatologist Charles David Keeling presented indisputable proof that carbon dioxide from the burning of fossil fuels accumulates in the atmosphere instead of, as originally thought, being absorbed in the oceans and forests. Keeling’s precise method of measurement led to a data set known as the “Keeling Curve.” Decades later, in 1996, Keeling presented data suggesting that the increasing levels of GHGs in the Northern Hemisphere have led to earlier growing seasons, thus linking global warming with atmospheric carbon dioxide. Prior to his death in 2005, Keeling was paid homage for his research by Vice President Al Gore (1996) and later President George W. Bush (2002).

In March 2006, the National Academy of Sci-

ences issued a report with the following conclusion: "In the judgment of most climate scientists, Earth's warming in recent decades has been caused primarily by human activities that have increased the amount of greenhouse gases in the atmosphere. Greenhouse gases have increased significantly since the Industrial Revolution, mostly from the burning of fossil fuels for energy, industrial processes, and transportation." The report went on to state, however, that there is a "legitimate debate regarding how large, how fast, and where these effects will be." Culture warriors on both sides claimed victory by emphasizing key passages of the report—either that scientists agree that global warming is indeed taking place or that the ramifications of the phenomenon are unclear.

Many climatologists believe that global warming has led to an increase in erratic weather patterns, including extreme drought, heat waves, and devastating hurricanes, as well as a shrinking of the polar ice caps, the retreat of glaciers, and a rise in sea levels of 4 to 6 inches (10 to 15 centimeters) during the twentieth century. If GHGs continue to accumulate unabated, they warn, the planet could be headed for dire ecocatastrophe. On the other hand, experts agree that the multiple causal factors of weather and climate make projections pertaining to global warming a difficult and unreliable endeavor. Furthermore, projections based on computer models are only as good as the input data, which can be flawed due to erroneous assumptions regarding long-term effects. Thus, forecasts of loss of biodiversity, rising sea levels, increase in disease-causing agents, pending economic disasters, and the like are less than certain. For the same reasons, it remains unclear to what extent humans would have to change their behavior in order to reverse the trend of global warming.

The debate on global warming has often been accented along ideological lines, between conservatives (often Republican) and moderates to liberals (often Democratic). Usually, the approach of either side has been to take advantage of the lack of scientific consensus by drawing on the findings of select favorite scientific studies in order to justify its particular political or economic viewpoint. Those like Al Gore, who in his Oscar-winning documentary film *An Inconvenient Truth* (2006) warns of impending catastrophic environmental harm if global warming is left unchecked, are typically dubbed Chicken Littles by their opponents. Those like Senator James Inhofe (R-OK), who in 2003 characterized warnings about global warming as "the greatest hoax ever perpetuated on the American people," are often ridiculed as members of the Flat Earth Society. Increasingly, however, activists fighting global warming like Gore—who was awarded the 2007 Nobel Peace Prize for his efforts to "disseminate greater knowledge about man-made climate change"—have outnumbered naysayers both internationally and in

the United States and have found resistance weakening in the face of mounting evidence.

In 2006, Gore called on the U.S. Congress to pass legislation requiring the coal, oil, mining, and utility industries to significantly reduce their GHG emissions. Opponents, including the Bush administration, argued that such an approach would put inordinate stress on the economy. Many Democrats and some Republicans have responded to economic concerns by suggesting financial incentives for reducing GHGs, such as a market-based emissions trading system that would spur the development of new technologies and simultaneously stimulate the economy by creating new jobs to meet the demands of "green technologies." In the meantime, conservatives such as Vice President Dick Cheney used the concern over GHGs to promote the development of a new generation of clean-burning nuclear power plants.

One contentious issue of global warming is the need for a global response and how to achieve it. Since Americans have contributed significantly to the problem, producing an estimated 25 percent of total GHGs, staunch environmentalists believe that it is right and fair for the United States to reduce its carbon dioxide emissions in proportion to its contribution to global warming. Others have disagreed with that conclusion if it means that developing nations such as China and India can continue to *increase* their levels of GHGs. The Kyoto Protocol (1997), which was signed by President Bill Clinton and the leaders of some 180 countries, stipulated a higher reduction of GHGs by the world's developed nations. The U.S. Senate voted not to ratify the Kyoto Protocol, however, and most other conservatives repudiated the accord as unfair because it would require the United States to spend billions of dollars to reduce GHGs and make it more challenging for American companies to compete in the global marketplace. On the other hand, both liberals and conservatives have argued that the U.S. economy would actually prosper if the nation became a leader in the development of eco-technologies.

Mabesh Ananth

See also: Bush Family; China; Environmental Movement; Globalization; Gore, Al; Kyoto Protocol; Nuclear Age; Science Wars; Warren, Rick.

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