

# Climate Changes; Society Has To Learn T

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For more than a decade, scientists, policy makers, and interest groups engaged in a sometimes vitriolic debate about the Earth's climate.

The essence of the debate can be summarized as "Global Warming: Yes or No?" Scientific language was often central to this controversy, with each side calling upon computer models and technical experts to bolster its case. But scientific differences were just a mask for competing policy prescriptions, with "Global Warming: Yes" meaning emissions reductions, and "Global Warming: No" meaning business as usual.

Political victory for the "Global Warming: Yes" side of the equation was signaled, ironically enough, when President Bush declared that the United States was pulling out of the Kyoto Protocol, the international agreement aimed at limiting greenhouse gas emissions. Had Bush simply continued the policies of the Clinton administration — fund more scientific research, while taking no politically controversial actions — the debate might have continued unresolved. But by removing the debate from the laboratories, Bush unleashed a tide of domestic and international outrage.

The idea that the Earth's atmosphere is getting warmer is now so broadly accepted that even such staunch opponents of Kyoto as Sens. Robert Byrd and Ted Stevens have introduced legislation to address the problem. Many companies as well, including Ford and British Petroleum, have begun to recognize the desirability of responding to global warming.

But even as the policy debate moves toward resolution, the scientific debate rages on unabated. Eighteen billion dollars worth of U.S. government-funded research over the past decade has yielded many new insights about our climate, including a picture of the past that shows sporadic surface temperature increases in the early and latter parts of the 20th century. But accurate predictions of future climate remain out of reach.

The relations between human activities, the global environment, and the evolution of the atmosphere are much more complicated than scientists had thought. New scientific investigations yield new complexities, and even the most basic questions — what is the "average temperature" of the earth's surface; how much will that temperature rise with a doubling of carbon dioxide levels? — appear more uncertain now than they were 10 years ago.

Of course it is quite reasonable to believe, as many climate scientists do, that the record of past temperature increase, combined with knowledge of atmospheric chemistry and physics, foretells a warmer future. But what such scientists do not, and cannot, know is this: what will be the impact of such warming on humans and the environment, and how will those impacts change if we limit emissions?

From this perspective, the political and scientific debate over global warming has created nothing but losers. How can this be? Society's obsession with the "Global Warming: Yes or No?" controversy has obscured two crucial facts.

The first is this: Climate changes. The record of past climate shows great variability at every time scale, from years to millennia and beyond. In other words, a changing climate is an unchanging attribute of a dynamic earth.

The second overlooked fact is that the impacts of climate and climate change are a reflection of vulnerability in society and the environment.

For example, when urban development occurs on a flood plain or unstable mountainside, human populations render themselves vulnerable to climate. The vulnerability of endangered species may increase when natural habitat is destroyed. Natural disasters, chang-

ing patterns of disease and health and threats to biodiversity and water resources all reflect the vulnerability of humans and the environment to climate impacts. Such vulnerability can affect international trade, financial services, transportation networks, agriculture — virtually any area of human activity.

And vulnerability tends to increase as population grows, as people migrate to cities and coastlines, as forests are cut down and river valleys are inhabited, as economic activity and interconnectedness increase over time.

Not only do these types of changes occur regardless of how the climate behaves, but the vulnerability they create tends to dwarf the effects that can be attributed to a changing climate. For example, the alarming increase in damage and deaths from hurricanes over the past decade is due entirely to the increasing number of people in harm's way — not to any changes in the frequency or size of the hurricanes.

So, while improving energy policies remains, for many reasons, a good idea that we strongly endorse, it should not be the centerpiece of a strategy to reduce the impacts of climate on humans and the environment. Reducing emissions will not stabilize climate, because climate is not stable to begin with. And even if climate were stable, the dominant cause of climate impacts is vulnerability, not climate change.

In short, society cannot successfully respond to the threat of climate impacts by stopping climate change. Rather, we must learn to adapt.

Sadly, climate policy makers continue to focus on energy policy as the primary means to address future climate impacts. The approach is simply doomed to fail.

Why has the idea of adaptation been so neglected in the political and scientific arenas?

First, environmentalists have opposed adaptation because they believe it undermines the argument for stabilizing climate and for moving toward sustainable energy policies.

Second, for those opposed to environmentalism, adaptation implied that there is actually a problem that needs to be adapted to — an admission that polluting energy companies, for example, were loathe to make.

Third, adaptation requires politicians to address such sensitive issues as international economic development and assistance — issues that they would often prefer to avoid.

Finally, accepting the need for adaptation means abandoning the idea that through energy policies we can control the climate in desired ways. The sheer complexity of the earth system mean that that such control of the climate will always be illusory.

The adaptation taboo is the most damaging legacy of the global warming debate. This taboo must be overcome.

Here again, President Bush's politically clumsy decision to abandon the Kyoto agreement may ironically allow us to move in a better direction. As the United States considers new options for action, decision makers should recognize that the most significant challenges for environmental protection and human development can best be met through efforts that reduce the many sources of societal and environmental vulnerability to such impacts.

Energy policies should complement, not overshadow, such worthwhile efforts.

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