



[back to capenews.net](http://www.capenews.net)

WHOI Scientists Say Climate Change Report Confirms Consensus On Influence Of Human Beings On 'Unequivocal' Global Warming

By BRIAN H. KEHRL

The strong language included in a report approved last week by an international group of climate scientists, which declared global warming is "unequivocal" and is "very likely" caused by humans, should help convince American politicians and the public of the reality of climate change, according to two scientists at the Woods Hole Oceanographic Institution.

The fourth report of the Intergovernmental Panel on Climate Change, produced by about 600 authors from more than 40 countries, said increasing global temperature, rising sea levels, and unpredictable and shifting weather patterns are, with 90 percent certainty, the consequences of burning fossil fuels and other human activities.

The report, the fourth of its kind, does not include any groundbreaking data or studies, but Karen L. Bice and William G. Thompson, both of the geology and geophysics department at WHOI, said the broad international consensus needed to approve the report, including reviews by representatives from 113 governments from around the world and a painstaking line-by-line editing process to approve the final draft, should deflate the notion that the scientific community is at odds over whether global warming is, in fact, happening and whether humans are behind it.

Scientific Consensus

"They all had to agree on every word of it," said Dr. Bice, an associate scientist with the institution. "That is one of the reasons the IPCC report is so important."

"We need politicians and the public to know that there is a consensus about this, a consensus that this is real," she said.

Despite common criticisms to the contrary, Dr. Bice estimated that 98 percent of climate scientists not only agree that global warming is taking place, but also that humans are causing at least some of it.

The criticism that scientists do not agree on global warming has been a primary concern of those who do not accept arguments about the human effect on climate change.

"Very few reputable scientists at this point would disagree with the statement that human activities are influencing the climate," she said.

To convince politicians and the public that there is a general agreement, Dr. Bice said she would have preferred that the report emphasize more explicitly the rigorous process used to produce the report.

The document released last week was a 21-page summary of a forthcoming full scientific report, due out in May. Titled "The Physical Science Basis," the final report will focus on establishing the scientific proof of global warming through a sweeping assessment of all peer-reviewed literature on the subject through the middle of last year, leaving the more difficult and unpredictable questions of specific impacts and possible policy solutions to two subsequent reports due out this spring. A synthesis of all three final reports is expected by the end of the year.

The World Meteorological Organization and the United Nations established the IPCC in 1988, and the panel is open to all members of the UN.

Thus far, Dr. Bice said the political influence in the United States, which generates a quarter of the world's greenhouse gas emissions, on scientific findings about climate change has been "very discouraging."

For example, she cited recent news reports that President George W. Bush has signed a directive requiring that political appointees review policy and regulatory documents written by scientific experts, thereby increasing political sway over environmental studies.

Additionally, two independent advocacy groups, the Union of Concerned Scientists and the Government Accountability Project, reported to Congress in January that almost half of 279 federal scientists, including those at the Environmental Protection Agency and NASA Goddard Institute for Space Studies, responded in a survey that they had been told to delete references to "global warming" or "climate change" in reports. More than 40 percent of the scientists reported that editing changed the meaning of their work.

Senator James M. Inhofe, a Republican from Oklahoma, in 2003 called global warming "the greatest hoax ever perpetrated on the American people."

"This is science," Dr. Bice said of the IPCC report. "This is not a government report," she said.

Dr. Thompson said even though the scientific community has become more unified in the conclusion that humans are influencing climate change, public opinion in the United States has moved in the opposite direction.

Still Cautious Language

Dr. Bice and Dr. Thompson both said the consensus process, while necessary, by nature ended up with relatively conservative conclusions. Data can be interpreted differently, and scientists are skeptical by nature, Dr. Bice said, so asking a group of them to agree on a broad report usually results in the lowest common denominator.

"I would say that it is a fairly good estimate of the lower bounds of warming and sea level rise, and that, most likely, the real changes will be greater than what the IPCC report says," Dr. Bice said.

The IPCC said the climate is likely to warm up to 8 degrees Fahrenheit if the concentration of carbon dioxide, the most important human-generated

greenhouse gas, reaches twice the levels of 1750, before the Industrial Revolution. Carbon dioxide, a heat-trapping gas and byproduct of burning fossil fuels such as coal, oil, and gasoline, has already increased from a pre-industrial level of 280 to 379 parts per million in 2005, according to the report, and the fastest rate of growth was during the past decade.

In the next 20 years alone, global temperature is predicted to rise by .7 degrees Fahrenheit, according to the report. And there is a one-in-10 chance that the planet may warm considerably more.

Dr. Thompson said, "By its nature, something like this doesn't capture the full range of ideas that are out there because it is trying instead to capture a consensus."

For example, the rate of temperature increase has accelerated over the past 10 years, so an important question becomes whether the acceleration will continue—which would lead to much more drastic changes—or if it will level out and continue on a line.

Dr. Thompson commended the IPCC approach of explaining why certain things are not understood, rather than affirming predictions that cannot yet be proven.

However, the report uses more direct language to describe both climate change and the human impact on it than has yet been used by an IPCC report.

For the first time, the IPCC has declared without qualification that the average temperature on the planet is unnaturally increasing. Eleven of the last 12 years are among the warmest 12 years since 1850, according to the report. The warming trend over the past 50 years is twice that of the past 100, and it is unusual compared to at least the last 1,300 years.

Samples of air and water composition taken from deep ice cores are used for historic and prehistoric comparison.

The IPCC report also focused on establishing the effect of human "forcing" on the increased temperatures, as opposed to natural fluctuations. It said that human activities are "very likely"—or at least a 90 percent probability—the cause. The 2001 conclusion of "likely" was a probability of between 66 and 89 percent.

"They have changed their tone from sort of a wishy-washy, 'well humans might be changing the climate,' to now 'humans are very likely causing climate change,'" Dr. Bice said.

Conversely, the IPCC report said it is "extremely unlikely" that the increased temperatures can be explained without human effects. To explain the changes in conclusions since 2001, the six years since the last IPCC report allowed for more data measured over a longer time with better computer models, according to the report.

"The longer the observational record, the better we understand that we are on a trend of warming and rising sea levels," Dr. Bice said. "It's just exactly the way you would hope that science progresses."

Rising Seas

For land areas around the globe, the report said it is "virtually certain" that there will be fewer cold days and nights, more hot days and nights. Certain locations, including New England and the northeastern part of North America, will "very likely" see more precipitation. Storms also may increase in intensity and duration.

But, perhaps of greatest concern to Cape Cod, and likely also to the half of the world's population living within 125 miles of the coast, are the estimates on rising sea levels.

"The idea that the sea level could change grabs your attention if you live near the coast," Dr. Thompson said.

The report predicts an increase of 7 to 23 inches by 2100, with a likely increase of "extreme high sea levels" through the 21st century.

Several factors contribute to the swelling sea levels, including the melting of glaciers, polar ice caps, and ice sheets and that the ocean absorbs more than 80 percent of the heat added to the climate system, causing sea water to expand.

While the sea level increase has thus far been minimal—a little more than a tenth of an inch per year for the last decade—the last time the polar regions were warmer than the present—125,000 years ago, when temperatures were about 6 to 10 degrees Fahrenheit higher than present—the corresponding melting of ice led to about 13 to 20 feet of sea level rise.

The authors acknowledge that insufficient computer models keep them from predicting with any precision the consequences of the Greenland ice sheet melting, or even whether it will happen, though they do suggest that it may boost sea levels by as much as 23 feet over several centuries.

In some of the report's projections, Arctic late-summer sea ice disappears almost entirely by the end of the 21st century.

One of the big unknowns of climate change—and an extremely important factor for sea level change—is how the polar ice sheets will behave, Dr. Thompson said.

"We just don't know enough about the physics of them," he said.

Beach sand already often washes up on a road by his house, near Waquoit Bay, Dr. Thompson said. At a rise of one-quarter inch per year, as the IPCC report predicts will happen, the rate of change may be imperceptible. But after 100 years, tides that peak two feet higher could make a considerable difference.

He suggested looking at a topographic map of Cape Cod to see the consequences of rising sea levels.

For example, if the sea level were to rise three feet, the shoreline in parts of Falmouth would be north of Route 28. Woods Hole would largely be under water, as would the area around the Mashpee rotary.

Rapid changes in temperature, climate, and sea level are not entirely unprecedented, he said, “The worry is that things could happen a little faster than we anticipate.”

The recent IPCC report, as well as its 2001 predecessor, are available online at www.ipcc.ch.

copyright 2007 Falmouth Publishing