Working Group I Contribution to the IPCC Fifth Assessment Report

Climate Change 2013: The Physical Science Basis

Summary for Policymakers

International panel's confidence increases that society is responsible for global warming

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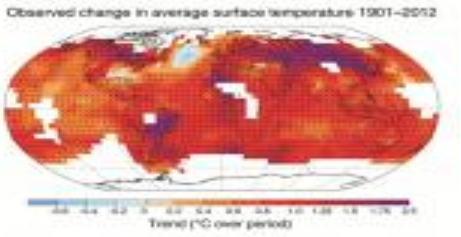

HOT AIR

In most regions of the world, surface temperatures rose (warm colors) from 1901 to 2012. Humans are responsible for this global warming, the Intergovernmental Panel on Climate Change concludes.

IPCC

Scientists are now 95 to 100 percent certain that humans are cranking up the global thermostat.

The boosted confidence in humans' role in climate change comes from a distillation of thousands of scientific studies, by the United Nations' Intergovernmental Panel on Climate Change, which released a summary of its findings September 27.

The IPCC, which produces such a report about every six years, had previously estimated only a 90 percent confidence level that human activities, such as burning fossil fuels, are contributing to the world's rising temperatures. A warmer climate threatens to raise sea level — drowning islands and coastlines — and dramatically alter agriculture and ecosystems around the world.

Global warming and its effects are unequivocal, the panel reports. Since the 1950s, the "atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased," the panelists wrote.

And now more than ever, the scientists say it is "extremely likely" that humans are to blame.

By burning fossil fuels, people release heat-trapping greenhouse gases such as carbon dioxide into the atmosphere. The panel reports that since the beginning of the industrial era, the atmosphere's CO_2 levels have increased by 40 percent.

At the report's release in Stockholm, Thomas Stocker, the cochair of the IPCC report, urged action. "In order to limit climate change," said Stocker of the University of Bern in Switzerland, "it will require substantial and sustained reduction of greenhouse gas emissions."

In the report, Stocker and the other authors presented four scenarios describing how current warming trends could play out in the next century, given varying efforts to reduce emissions and mitigate climate change. The panel predicted that by 2100, global average surface temperatures might rise by as little as 0.3 degree Celsius or as much at 4.8 degrees compared with the recent average.

For global average sea level, the panel made a bleaker prediction than previous reports. In the new scenarios, sea level could rise as little as 26 centimeters or as much as 82 centimeters by the end of the century compared with the recent global average. In the IPPC's last report released in 2007, the range was just 18 to 59 centimeters.

"The data is more certain," says atmospheric scientist and report coauthor Matilde Rusticucci of the University of Buenos Aires in Argentina. "So we hope the politicians take the message."

The report also knocks a common argument of those who deny human-caused climate change: that a plateau in the rise of global temperatures over the last 15 years refutes global warming (*SN: 10/5/13, p.14*). The authors say that climate over such short periods is not indicative of long-term trends, and that extreme weather — like heat waves — at the beginning or end of such time frames may skew data.

Skeptics tend to pick out weather variations over time periods that fit their arguments against global warming trends, says Paul Wapner, an expert in environmental politics at American University in Washington, D.C., who was not part of the panel. "The report makes clear that these trends cannot be questioned."

COMMENT

Citations

L. Alexander et al. Working Group I contribution to the IPCC Fifth Assessment Report climate change 2013: the physical science basis, summary for policymakers. Published online September 27, 2013. [Go to]

Suggested Reading

E. Wayman. Global warming hiatus tied to cooler temps in Pacific. Science News. Vol.184, October 5, 2013, p. 14 Available online: [Go to]

T. Lewis. Sea level rise overflowing estimates. Science News Online, November 8, 2012 [Go to]