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Climate Panel Cites Near Certainty on Warming

By **JUSTIN GILLIS**

An international panel of scientists has found with near certainty that human activity is the cause of most of the temperature increases of recent decades, and warns that sea levels could conceivably rise by more than three feet by the end of the century if emissions continue at a runaway pace.

The scientists, whose findings are reported in a draft summary of the next big United Nations climate report, largely dismiss a recent slowdown in the pace of warming, which is often cited by climate change doubters, attributing it most likely to short-term factors.

The report emphasizes that the basic facts about future climate change are more established than ever, justifying the rise in global concern. It also reiterates that the consequences of escalating emissions are likely to be profound.

“It is extremely likely that human influence on climate caused more than half of the observed increase in global average surface temperature from 1951 to 2010,” the draft report says. “There is high confidence that this has warmed the ocean, melted snow and ice, raised global mean sea level and changed some climate extremes in the second half of the 20th century.”

The draft comes from the [Intergovernmental Panel on Climate Change](#), a body of several hundred scientists that won the Nobel Peace Prize in 2007, along with Al Gore. Its summaries, published every five or six years, are considered the definitive assessment of the risks of climate change, and they influence the actions of governments around the world. Hundreds of billions of dollars are being spent on efforts to reduce greenhouse emissions, for instance, largely on the basis of the group’s findings.

The coming report will be the fifth major assessment from the group, created in 1988. Each report has found greater certainty that the planet is warming and greater likelihood that humans are the primary cause.

The 2007 report found “unequivocal” evidence of warming, but hedged a little on responsibility, saying the chances were at least 90 percent that human activities were the cause. The language in the new draft is stronger, saying the odds are at least 95 percent that humans are the principal cause.

On sea level, which is one of the biggest single worries about climate change, the new report says the assessment published in 2007, which largely sidestepped the question of how much the sea level would rise by the end of the century.



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The new report also reiterates a core difficulty that has plagued climate science for decades: While averages for such measures as temperature can be predicted with some confidence on a global scale, the coming changes still cannot be forecast reliably on a local scale. That leaves governments and businesses fumbling in the dark as they try to plan ahead.

On another closely watched issue, the scientists retreated slightly from their 2007 position.

Regarding the question of how much the planet could warm if carbon dioxide levels in the atmosphere doubled, the previous report largely ruled out any number below 3.6 degrees Fahrenheit. The new draft says the rise could be as low as 2.7 degrees, essentially restoring a scientific consensus that prevailed from 1979 to 2007.

But the draft says only that the low number is possible, not that it is likely. Many climate scientists see only a remote chance that the warming will be that low, with the published evidence suggesting that an increase above 5 degrees Fahrenheit is more likely if carbon dioxide doubles.

The level of carbon dioxide, the main greenhouse gas, is up 41 percent since the Industrial Revolution, and if present trends continue it could double in a matter of decades.

Warming the entire planet by 5 degrees Fahrenheit would add a stupendous amount of energy to the climate system. Scientists say the increase would be greater over land and might exceed 10 degrees at the poles.

They add that such an increase would lead to widespread melting of land ice, extreme heat waves, difficulty growing food and massive changes in plant and animal life, probably including a wave of extinctions.

The new document is not final and will not become so until an intensive, closed-door negotiating session among scientists and government leaders in Stockholm in late September. But if the past is any guide, most of the core findings of the document will survive that final review.

The document was leaked over the weekend after it was sent to a large group of people who had signed up to review it. It was first reported on in detail by the Reuters news agency, and The New York Times obtained a copy independently to verify its contents.

The Intergovernmental Panel on Climate Change does no original research, but instead periodically assesses and summarizes the published scientific literature on climate change.

The draft document “is likely to change in response to comments from governments received in recent weeks and will also be considered by governments and scientists at a four-day approval session at the end of September,” the panel’s spokesman, Jonathan Lynn, said in a statement Monday. “It is therefore premature and could be misleading to attempt to draw conclusions from it.”

After winning the Nobel Peace Prize six years ago, the group became a political target for climate doubters, who helped identify minor errors in the 2007 report. This time, the panel adopted rigorous procedures in the hope of preventing such mistakes.

Some climate doubters challenge the idea that the earth is warming at all; others concede that it is, but deny human responsibility; still others acknowledge a human role, but assert that the warming is likely to be limited and the impacts manageable. Every major scientific academy in the world has warned that global warming is a serious problem.

The panel shifted to a wider range for the potential warming, dropping the plausible low end to 2.7 degrees, after a wave of recent studies saying higher estimates were unlikely. But those studies are contested, and scientists at Stockholm are likely to debate whether to stick with that language.

Michael E. Mann, a climate scientist at Pennsylvania State University, said he feared the intergovernmental panel, in writing its draft, had been influenced by criticism from climate doubters, who advocate even lower numbers. "I think the I.P.C.C. on this point has once again erred on the side of understating the degree of the likely changes," Dr. Mann said.

However, Christopher B. Field, a researcher at the [Carnegie Institution for Science](#) who serves on the panel but was not directly involved in the new draft, said the group had to reflect the full range of plausible scientific views.

"I think that the I.P.C.C. has a tradition of being very conservative," Dr. Field said. "They really want the story to be right."

Regarding the likely rise in sea level over the coming century, the new report lays out several possibilities. In the most optimistic, the world's governments would prove far more successful at getting emissions under control than they have been in the recent past, helping to limit the total warming.

In that circumstance, sea level could be expected to rise as little as 10 inches by the end of the century, the report found. That is a bit more than the eight-inch increase in the 20th century, which proved manageable even though it caused severe erosion along the world's shorelines.

At the other extreme, the report considers a chain of events in which emissions continue to increase at a swift pace. Under those conditions, sea level could be expected to rise at least 21 inches by 2100 and might increase a bit more than three feet, the draft report said.

Hundreds of millions of people live near sea level, and either figure would represent a challenge for humanity, scientists say. But a three-foot rise in particular would endanger many of the world's great cities — among them New York; London; Shanghai; Venice; Sydney, Australia; Miami; and New Orleans.

