



Computer Projections About Earth Weather 2000-2100

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Earthfiles, news category.

January 13, 2000 Boulder, Colorado - What happens to global weather systems if the earth warms up several more degrees Fahrenheit in the future? That's a question that the Pew Center on Global Climate Change in Arlington, Virginia wanted to know. So, they went to a climate expert Dr. Tom Wigley at the National Center for Atmospheric Research in Boulder, Colorado. Dr. Wigley received his Ph.D. in Theoretical Physics from the University of Adelaide in Australia in 1967 and has become a climate expert. The past six years he has focused on computer models of earth weather systems to project the effects of ever-increasing greenhouse gasses. Recently, Dr. Wigley's computer research was released by the Pew Center.

He presented two possible scenarios: one in which carbon dioxide emissions would remain high over the next century. The other factored in cleaner energy technologies. The computer conclusions?

In the higher CO₂ emission scenario, the average surface temperature of the earth increases about five degrees Fahrenheit and the sea level rises about two feet.

In the lower CO₂ emission scenario, the average temperature increase is about 3.5 degrees and sea level rises about 1 1/2 feet. Not much difference.

The impact on temperatures and rainfall around the world can be summarized this way:

- Heating would not be uniform. North America would warm more than the global average.
- Northern latitudes would heat up more than southern ones. Cities such as New York and Philadelphia would have climates more like North Carolina.
- Winters would become shorter.
- Northern growing seasons would lengthen and more crops would thrive.

- Southern states might become so dry and hot that crops must be changed.
- Summer heat waves would become more dangerous as average temperatures and humidity shift upward.
- Both floods and droughts would increase in different parts of the world. The reason? The warmer the atmosphere becomes, the more moisture it can hold. Water will evaporate from the land more quickly between storms, but when it rains, the water will be much greater.
- Heavy downpours will not be absorbed by soil fast enough, so more flash flooding is predicted similar to what happened recently in South America.
- The heavier precipitation patterns mean that ironically, as the earth warms more over the next century, snowstorms could become heavier even though winters might be shorter.

I talked with Dr. Wigley about his computer projections today and asked him if he was optimistic or pessimistic about our future in relationship to global warming, weather events and the impact on people.

Interview:

Tom Wigley, Ph.D., Climatologist, National Center for Atmospheric Research, Boulder, Colorado: "I'm neither optimistic nor pessimistic. I'm realistic. I don't think we're going to respond rapidly to this problem, but I don't think we're heading for catastrophe. I think in North America and in Europe that the changes that are going to occur and I think certain changes are inevitable we can respond to, we can adapt to. But there are other parts of the world that will not be able to respond to what's going to happen. And these things are going to happen no matter what we do. The real issue is: coastal environments, so there are low lying island states, coastal areas that have inevitable sea level rises that they are going to cope with and I think that's going to be really difficult.

So we're going to end up with people who might be forced to move from islands and low coastal areas because there is no option.

That's true. And there are other problems as well and not just related to sea level rise directly. But in a country like Bangladesh, for example, very low lying for a large part of its area. It's affected by tropical storms in the Bay of Bengal. As sea level rises, then the storm surges associated with those tropical storms are going to be far more damaging. So, they are going to get it basically in spades.

If storm surges and sea level rise threaten survival, where does a large coastal population go?

It's not just the huge population that's there now. But there's a very substantial population growth rate in Bangladesh and many of these countries, too. So if we think about what it might be like 30 years in the future, higher sea level, a remote possibility of stronger and more frequent tropical storms and perhaps double the population I just don't know how we can possibly cope with problems like that. By we, I mean the global population. This is a global problem and we have to tackle the problem as a global community.

One of the trigger points is that the Mediterranean basin, the southern part of Europe, is almost certainly going to get a lot warmer and probably drier. So that means that people around the Mediterranean Basin, people in Africa, for example, are going to find that they are living in a climate that they cannot cope with. So, what do they do?

Can we ever get to the point where we could artificially control weather systems of the earth to cope with large areas of the planet not able to sustain food and habitation?

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Credit: another issue that has been explored to some degree it's the issue of geo-engineering. Copyright © 1999 - 2009 by Linda Moulton Howe. Well, right now we are performing an uncontrolled experiment and we don't really understand what's happening and we can't predict what's going to happen in the future.

The uncontrolled experiment being our industrial emissions of carbon dioxide into the atmosphere?

Exactly. So, given the uncertainties there right now would be very dangerous to try to geo-engineer the climate. To actually deliberately try to do something to change the climate because the possibility of predicting what might happen if we do something deliberately is quite remote. That's just as difficult a problem as predicting what's going to happen due to increasing greenhouse concentrations.

Now, it might be that 10, 20, 30 years down into the future that we have better models and we understand the systems better, that we could contemplate artificially modifying the climate to suit our own desires. That's not an impossibility. All things are possible. We get smarter as we go on.

But tricky to do without causing even greater problems?

Could be, but if we have good models and can predict what's going to happen, we decide what to do on the basis of those predictions.

If the earth warms up 6 or more degrees F. over the next 100 years, it would be six times warming in the previous century. Would storms scale up in energy as well?

No, they wouldn't. To just give you one concrete example and I think it's mentioned in my Pew report. Hurricanes, according to some model predictions, would become more intense. In other words, the winds associated with hurricanes would be stronger. But they wouldn't be 5 times stronger. They might only be 5% stronger.

Things do not scale up in that way, fortunately. You know, I'd hate to see hurricanes 5 times as strong. To do any scaling exercise, you have to look at weather now compared to weather 100 years ago. So, then you say: Are the winds much stronger now compared with what they were 100 years ago? And the answer is, not noticeably.

Are hurricanes more intense now than they were 100 years ago? And the answer is: not noticeably."

More Information:

A sign of the times - On January 7, 2000, the *Waukegan News-Sun* in Illinois had this headline: "Nicor buys insurance against warm weather." Nicor is a natural gas company headquartered in West Chicago.

The story reads: "For the first time, Nicor said it has purchased a weather insurance policy designed to protect the company from losses in the event of unusually warm weather. The one year policy, which became effective January 1, will pay Nicor when the weather is more than 6.5% warmer than normal. The policy is being provided by North American Capacity Insurance Co. and will cost Nicor 1% of its earnings for 2000, according to Nicor spokesman Lee Haines."

Websites:

http://www.pewclimate.org/projects/env_science_execsumm.html