U. N. Global Warming Forecast: Up to 10.5 Degrees F. Hotter At End of 21st Century

Lightening in violent thunderstorm courtesy National Severe Storm Center, Norman, Oklahoma.

Earthfiles, news category.

"The idea of having a planet that really warmed 10 degrees Fahrenheit is rather baffling. That's the same change we saw back to the last Ice Age. And obviously that was a hugely different kind of world to live on. So, if we really experience something at that high end of temperature warming, it sounds like there is a possibility for widespread disaster."

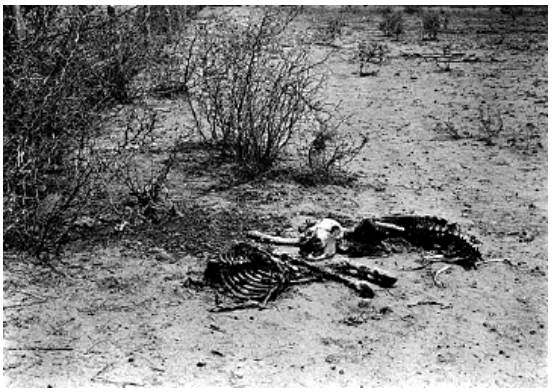
- Drew Shindell, Ph.D., Atmospheric Physicist, NASA/GISS

January 28, 2001 New York City The largest decline in a mammal population ever recorded by modern scientists has occurred in the otter population of the Aleutian Islands off the west coast of Alaska. In the 1980s, as many as 100,000 otters inhabited the islands. Today, there are only about 6,000 left. And 70% of that decline occurred between 1992 and 2000, a rate of decline that scientists say is unprecedented for any mammal population in the world. Researchers have been trying to find out what happened. And the answer seems to be global warming. Warmer ocean currents in the Aleutians have driven out the huge population of seals and sea lions that used to be the staple food of killer whales. When the seals and sea lions disappeared, the whales turned to otters for food. As water temperatures increased, so did the salmon population. Salmon have attracted sharks. So, in a few short years a warmer water temperature has transformed the once safe mammal sanctuary of the Aleutian Islands into a feeding ground for predators.

Just how bad could global warming be over the next several decades? This past week, the United Nations Intergovernmental Panel on Climate Change released a 1000 page volume entitled "Climate Chnage 2001: The Scientific Basis" about what could happen based on computer projections from atmospheric physics

laboratories around the world. The study has taken five years of new data and input from global scientists to help understand what the consequences of greenhouse gas build up will be. The bottom line is that every computer model projects the same outcome: this planet will steadily warm up over the next hundred years from 3 to 10.5 degrees Fahrenheit.

To put those numbers in perspective: Scientists thought it was alarming to learn that in the 20th century the global annual mean temperature had risen 1 degree Fahrenheit. That means all the world's sophisticated climate modeling computers agree that the next hundred years could warm three to ten times as much. Greater extremes of drought and flooding along with accelerated sea level rise are some of the consequences.



Oklahoma drought courtesy Farm Security Administration.

Feather River flood in Yuba County, Calif., January 4, 1997.
Photograph © 1997 by California Dep. of Water Resources.

I discussed the climate change report with Dr. Drew Shindell, Associate Research Scientist for Global Climate Change at the NASA Goddard Institute for Space Studies known as GISS. He is also Adjunct Research Scientist at the Center for Climate Systems Research at Columbia University's Dept. of Earth and Environmental Sciences in New York City.

Interview:

Drew Shindell, Ph.D., Atmospheric Physicist and Associate Research Scientist for Global Climate Change at the NASA Goddard Institute for Space Studies (GISS): "It's a frightening thought if we were to really hit the high end in the projections. And there is a lot of uncertainty, so we end up with a range from a maximum of 10.5 degrees or so down to only a few degrees. But even the lower end is still quite a large amount of warming and a few degrees warmer is more than we saw during the 20th C. The possibility for changes in something like rainfall especially is rather alarming. Rainfall is a very difficult thing to predict, or precipitation in general. But most of the models indicate that the largest decreases in rainfall would be in the tropical areas which are already rather limited in the amount of rain they get.

What we are talking about is that the areas up in the north and mid latitudes where the countries are fairly well developed and can cope more readily with climate change would not suffer nearly as much as the developing world which would be large changes in precipitation, more droughts, more floods, a lot more weather extremes. And of course, those areas are not well equipped to cope with that. So we see a lot of possibility for the developing world to suffer much more severe weather and damage to crop yields especially which is a frightening thing.

WHERE FOOD IS ALREADY A PROBLEM, FOOD WOULD BECOME A GREATER PROBLEM.
Exactly. And the infrastructure in those countries are the least equipped to cope with that kind of change. Just having a warmer planet means that the water in the oceans will expand just because the air is warmer and the water itself becomes warmer. There is also the possibility of the melting of ice sheets in the polar regions which is quite uncertain. If such a thing were to take place and all of that water that's now locked up in the fresh water in the big ice sheets were to slide into the ocean, we would have a much larger rise in sea level. But even without that, it seems extremely likely that sea level will continue to rise as it has been doing during the 20th century just due to the thermal expansion of heating the water. So that is one quite probable outcome or impact of the warming temperatures.

WE'RE TALKING ABOUT AT LEAST A 3 FOOT SEA LEVEL RISE AND IF THERE WAS A 10.5 FAHRENHEIT INCREASE GLOBALLY IN THE NEXT 100 YEARS, THAT THREE FEET RISE MIGHT GO FIVE TIMES HIGHER?
It could be something like that. It could be a very large increase. That would require something like a very large melting of the ice sheet in Greenland or a very large portion of the ice sheet over Antarctica sliding into the ocean. These are things we don't have a lot of confidence in our ability to predict.

IS IT FAIR TO SAY THAT THE GENERAL CONSENSUS OF SCIENTISTS WHO ARE STUDYING CLIMATE CHANGE TODAY IS THAT WE ARE IN A GLOBAL WARMING TREND IN WHICH WE DO NOT HAVE ANY DATA TO SUGGEST THAT THAT GLOBAL WARMING WILL END OVER THE NEXT 100 YEARS?
I think that is quite accurate. I think the data that we have is quite clear in showing that the surface temperatures and temperatures in much of the lower atmosphere have increased. I think the majority of evidence in all scientists' minds points to human activities as having been responsible for a large portion of this increase. And we don't see any likely drastic change in these activities and furthermore, there is a large time lag of several decades in how long it takes for the entire planet to respond to the changes. So, we're still going to be feeling the effects of what we did in the 20th C. when we know there were very large emissions of greenhouse gasses well into the 21st C. regardless of what we do in the 21st. So, I think most people, most scientists would agree, that almost all scientists would agree that the earth is almost without question is going to warm during the 21st C.

WHAT DO YOU SAY TO PEOPLE WHO LOOK AT THIS WINTER OF 2001 AND SAY THIS IS AS COLD AS IT'S BEEN IN 10 YEARS OR WHATEVER AND THEREFORE, THERE IS NO GLOBAL WARMING?
One year or even several years don't prove the point. It's a long-term trend in climate that we're worried about rather than short term fluctuations of the weather. And just as the warm years of 1998 and 1997 and 1999 which were all record warm years. Those didn't prove by themselves global warming. So, the year 2000 being a cold winter, doesn't prove there is no such thing as global warming. It's a long term change that we're interested in here.

WHEN YOU ARE CONSIDERING 3 TO 10 DEGREES WITH AS MUCH AS YOU KNOW ABOUT CLIMATE AND ATMOSPHERIC PHYSICS, AND YOU ARE SITTING THERE AS A PRIVATE INDIVIDUAL ON THE EARTH AND YOU ARE CONTEMPLATING A 10 DEGREE

CHANGE AS A POSSIBILITY OVER THE NEXT 100 YEARS, WHAT IS YOUR PERSONAL REACTION TO THAT?
Well, my personal reaction is that I hope we don't end up at the high extreme and I hope that either the range of model results. The idea of having a planet that really warmed 10 degrees is rather baffling. That's the same change we saw back to the last Ice Age. And obviously that was a hugely different kind of world to live on. So, if we really experience something at that high end (of global temperature increase), it sounds like there is a possibility for widespread disaster.

DO YOU GET TOGETHER WITH POLITICAL LEADERS WHO ASK SOME OF YOU TO COME AND DISCUSS WHAT THE REALISTIC CONSEQUENCES OF 3 FEET OR ABOVE SEA LEVEL RISE WOULD DO TO THE COAST LINE AND WOULD OFFICES LIKE FEMA HAVE TO CONTEMPLATE THERE MAY HAVE TO BE EVACUATIONS FROM COAST LINES?
Well, I think agencies from around the U. S. are beginning to become more aware that they should consider adaptation strategies to the things that we consider more likely outcomes. And one example of that is the American National Assessment of the Impact of Climate Change that came out last year and was designed to have scientists to work in partnership with local agencies and governmental bodies to try to decide about the possible impacts and what kinds of things we need to worry about. One example here in New York is that we worked with the Port Authority that runs a lot of transportation facilities and tried to look at what might happen to the ability of trains, tunnels and so on as sea level rose around the harbor. So, I think people are starting to look at the possible consequences and try to figure out ways they can adapt by anticipating what's likely to go wrong.

COULD NEW YORK END UP HAVING TO HAVE DIKES BUILT UP AROUND IT LIKE HOLLAND?
Well, certainly some areas quite low to the water would be likely to either go under or have to be protected.

ARE THEY TALKING ABOUT DIKES?
I don't think that is something that's going to happen in the immediate future, but I think protecting at least crucial areas of infrastructure is something they are starting to plan for.

WHICH MEANS THERE IS ENOUGH OF A WATER RISE TO BE POLITICALLY CONCERNING.
Yes, I think so. It's quite clear that sea level has risen during the 20th C. And this rise in sea level is something that we have a great deal of confidence in our ability to predict, assuming we know the temperature change. So, if you assume a 3 to 10 degree warming, it's quite easy to say what that will do to water. And if you stick water on your oven, you can warm it up by a few degrees and measure quite easily it expanded. So, it's quite a straightforward process.

RIGHT, AS WATER INCREASES IN TEMPERATURE, IT EXPANDS AND THEREFORE, IT GETS HIGHER.
That's right and that's something we fully understand, so we can predict with pretty high confidence what will go on.

IN THE PAST COUPLE OF WEEKS PRIOR TO THE RELEASE OF THE U. N. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE PRESS RELEASE, SOME PEOPLE SAITHAT GLOBAL WARMING IS PHONY, GLOBAL WARMING IS NOT REAL. WHERE DO YOU PERSONALLY THINK THOSE KINDS OF STORIES AND HEADLINES COME FROM?
There are a few scientists out there which legitimately question some of the uncertainties and are not convinced that global warming is due to human impacts. Part of the scientific process is that not everybody agrees with any particular. proposed theory or explanation for any given thing. But eventually, we tend to come to a consensus and the vast majority of scientists working in this area are now quite convinced that in fact the global warming we have been

seeing is most likely due to human activities.

There is also a group of people who do not publish in credible scientific literature who make personal attacks on authors, attack the scientific process in general as being biased, and generally it seems to me these people have a political agenda which is overriding their desire to really evaluate what the scientific evidence is saying."

More Information:

The United Nations Intergovernmental Panel on Climate Change (IPCC) has produced a 3-volume report. The first volume concerns the science of climate change with an evaluation of data from past climate information and projections of future climate. It has been summarized in 18 pages at the website http://www.ipcc.ch based in Switzerland. The other two volumes detail assumptions about human impacts such as industrial and agricultural emissions that go into making projections about what could happen in 21st Century climate change.

U. N. Also Reports Global Warming May Be Especially Hard On Africa

Klaus Toepfer, Executive Director of the U. N. Environment Program (UNEP) told reporters, "It is a very dramatic situation. The evidence is absolutely clear that the speed of global warming is going faster and faster. Africa's share of the global population is 14%, but it is responsible for only 3.2% of global carbon dioxide emission. Yet, (Africans) face the most direct consequences with regard to extreme weather conditions with regard to drought and storms."

An example of those weather extremes occurred in 2000. Floods battered Mazambique while prolonged drought in the Horn of Africa brought starvation to millions of people.

Websites:

http://www.ipcc.ch

http://www.giss.nasa.gov

http://www.noaa.gov

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