Global Warming, and the Intergovernmental Panel on Climate Change

Interview with Ron Stouffer
July 18, 2007

BARRY REICHENBAUGH: This is Barry Reichenbaugh with the NOAA Research Communications Office and I'm in Princeton, New Jersey, at the Geophysical Fluid Dynamics Laboratory with Ron Stouffer. Ron, welcome.

RON STOUFFER: Thank you.

BARRY REICHENBAUGH: Ron, can you start out by just telling us your title and what it is you do for GFDL?

RON STOUFFER: Okay. My name's Ron Stouffer. I am a physical scientist here at GFDL. I've been here for about 30 years. I study climates, past, present, and future. And, I use models that are run on supercomputers to do that research.

BARRY REICHENBAUGH: I'm wondering if you could talk a little bit about global warming and the evidence for that?

RON STOUFFER: Okay. That's a very broad topic and its one that people have written whole books about. And so, this is going to be a very thumbnail sketch of it.

There are a number of different lines of evidence that we -- the way we know that global warming is really happening in the real world and continue to happen into the future.

The first bit is that the evidence is that greenhouse -- the so-called greenhouse gases -- these are gases that trap heat in the Earth's atmosphere and makes the Earth warmer. But, those gases are increasing and they're increasing due to human activities.

The main of those gases is carbon dioxide. And, carbon dioxide is produced just about whenever you burn anything. Virtually any form of combustion, burning gasoline in cars or making -- burning coal for power plants generates carbon dioxide. When you burn wood, it makes carbon dioxide. In fact, when we breathe, it makes carbon dioxide.

All of those sources are leading to an increase of carbon dioxide and other greenhouse gases in the atmosphere. And, our theory that we -- the way we understand how the climate works would tell us that the temperatures would increase because of those increasing greenhouse gases.

The observations are that over the last hundred years, the temperatures, as measured by thermometers around the world, show that the planet's been warming. It's warmed about one degree Fahrenheit over that period of time.

There are many other kinds of observations which would collaborate a warming world. For example, the snow lines as measured by satellites are going further north, sea ice is melting, precipitation patterns are changing. Those kinds of things are happening. And, in response, the natural system, way animals and plants are responding, are also changing -- that are all in agreement with the idea that the planet's warming.

We also can -- another line of evidence is that, in the past, when greenhouse gases have gone up, the planet's warmed. When the greenhouse gases have gone down, the planet has cooled. And, that goes along with the Ice Ages and so on.

And, another line of evidence is through the modeling that we do here at GFDL and other places where our computer models, when we put greenhouse gases into our computer models, the temperature as simulated by those models also goes up and down. And, as it turns out, we can do a pretty good job if we put in the realistic estimates of the last hundred years of greenhouse gas changes, we can do a pretty good job of simulating the observed changes in temperature.

BARRY REICHENBAUGH: NOAA research has been involved in supporting the intergovernmental panel for climate change. And, I'm wondering if you could talk a little bit about NOAA's role, GFDL's role, your role with the IPCC?

RON STOUFFER: Okay. The Intergovernmental Panel on Climate Change, or IPCC for short, is an activity that does an assessment of all of science involving climate change and things associated with climate change. It involves a large fraction of the world's top climate scientists and it was originally produced under the auspices of the UN and the World Meteorological Agency, but it's an independent group external to those two groups. It reports back to those two groups.

And, the process is such where the scientists write reports about climate change and what's causing climate change. And, it's kind of what's an assessment of the state-of-the-art.

And then, the governments accept the wording of the -- there's a Summary for Policymakers generated from those reports. And, the first draft of that is written by scientists and then governments go through it line by line, approving the wording. And, the scientists are there to not allow the meaning to be changed. And, at the end, it's a way for the governments to have buy-in into the climate science. And then, the next step in the IPCC process then is what the governments do with those reports is a political question among the governments.

NOAA's role in that process has been, in a sense, three ways. We supply authors where some of NOAA climate scientists are actually involved in writing the IPCC report.

The other way is that our papers that we're producing -- scientific papers -- which are mainly written to other scientists and are pretty opaque to normal humans to understand what's going on. Those papers are being assessed by this report and then condensed into a language that is understandable by the public.

And then, the third way that NOAA participates, our climate model results are used and made public through that process also. I've been involved in the IPCC as an author for the last three. There's been four IPCC reports. There was one in 1990, one in 1995, one in 2001, and one just very recently in January of this year, in 2007.

And, as I said, I was a contributor to the first one and an author of the next three. And, I've also been an author of the first draft of this Summary for Policymakers, or SPM for short, that -- for the 2001 and the 2007.

And then, finally, there is going to be a report coming out in November of 2007. There's three working groups

in the IPCC, one that investigates or assesses the physical climate science, one that assesses the impacts of the physical climate sciences on society and natural systems, and the third one evaluates how society is gonna respond to those changes in the future. And, there's gonna be a report that does a synthesis of those three working group reports. And, that's coming out in November and I'm working on that presently.

The next IPCC report hasn't been officially prescribed or set up yet by the IPCC. They're supposed to meet as a bureau in March of 2008, I believe, to determine what the timeline is going to be for the fifth assessment report. And, if there's even gonna be a fifth assessment report and what it's gonna look like. But, there has already been activity in the climate community trying to organize the climate community so we're ready for that fifth assessment report.

And, that involves all sorts of details about how the information is gonna be exchanged among the three working groups. It's been difficult in the past to, in a timely way, to get information to go from one working group to the next since we're all writing reports that are due at the same time at the end of the period.

And, there have been proposals about to offset the timing of the various reports or trying to coordinate the efforts that are going into the reports so that there actually would be some cross communication among the working groups. And, that is an activity that is going on right now that I'm participating in.

BARRY REICHENBAUGH: Let's shift topics a bit and talk about careers in science, specifically your career. I'm wondering what led to become a scientist?

RON STOUFFER: From a very young age, my parents told me that when I was 2 or 3, I wanted to be a fireman or a cowboy, like I guess every other kid wanted to be. But, in the middle 1950s, there was a series of hurricanes that went through central Pennsylvania and I have very strong memories of it raining so hard and the wind blowing so hard, it was pushing the water in and around the front door of my house and we had to put towels on the floor. And, I became fascinated by the weather.

And, snowstorms, hurricanes, thunderstorms, so I was a real weather weenie when I was growing up. I wanted every bit of weather information I could find.

And, when I went off to college, I went off to a college that I knew did -- that produced a lot of weather forecasters. And, that's what I wanted to be when I grew up.

And, when I got there, I discovered that weather forecasters work shifts and I said I didn't want any part of shift work because I can remember my father worked shifts and that was awful. And so, researchers don't work shifts. That's what got me to go into research.

And, what got me into climate was actually a very fortunate incident. I was looking for a job that was relatively close to where my parents and my in-laws live. And, it happened to be that one of the world's premier climate places on the planet was in that box and needed people, were hiring people.

And then, I also was very fortunate that I happened to start working with the man that probably started climate modeling as the world's foremost climate modeler, Suki Manabe. And, he trained me and taught me how to do climate research. And, I have been fascinated by it ever since. But, I still do weather forecasting as my hobby. I'm still a weather weenie at heart.

BARRY REICHENBAUGH: But not on the night shift.

RON STOUFFER: But not on night shifts, no. I hug my pillow at night.

BARRY REICHENBAUGH: What would you tell someone who is considering a career in science?

RON STOUFFER: Over my 30 years that I've worked here, I've interacted with a lot of high school students and students -- or college students -- and I tell them all the same thing. For any science that you want to go into, you need to be very good at math and mathematics. And so, as you're going through high school and then again in college, you want to take just about all the mathematics you can.

And then, after that, there is a lot of -- typically, there are a number of different types of science that you could be interested in. I could've easily been a chemist. I was very good at chemistry and I enjoy chemistry to this day as an example. But, my first love, obviously, was meteorology.

Find what you like to do and use it to study that area. That way, your job isn't a four-letter word for you, it's a three-letter word. And, it's a much better life than having something where you can't stand to go to work.

BARRY REICHENBAUGH: What keeps you so interested in your particular field of climate research?

RON STOUFFER: What motivates me is interesting. I enjoy, and what I like to do -- and, this is true for a fair number of scientists. They like to find new ideas or think about things that other people haven't thought about.

So, the things that really turn me on and get me gone in the morning or make me really happy when I go home at night is to think about papers or results that involved ideas that are new, things that are pushing back the frontiers of what we understand and of what we know about climate. So, those are the things I'm really interested in and motivate me.