

# GLOBAL CHANGE RESEARCH: “THE ROLE OF CLOUDS IN CLIMATE CHANGE” HEARING

BEFORE THE

## COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION, UNITED STATES SENATE

ONE HUNDRED SECOND CONGRESS, FIRST SESSION

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*(P84)* Senator GORE. Yes, Dr. Betts.

Dr. BETTS. I wanted to make a few, brief comments, Mr. Chairman, on this issue. Because I think the real problem that is faced by the political system is even worse, perhaps, than you suggest. Because even though I have spoken, for example, about what we do understand about the water vapor feedback in the Earth's atmosphere, I am well aware of the uncertainties in all the modeling efforts in the whole climate system.

And if you look at the complexity of the system we are dealing with, and look at the dilemma that we are faced with in the next few decades, if we wait a few decades for increased observational certainty-as has been suggested-it may be one or two decades before the record is clear, because of the natural fluctuations in the climate. We will have increased real confidence that we are seeing a greenhouse signal, if we wait. At the same time our models are less than satisfactory, but we hope that they will improve.

We have to recognize that we have to deal with the interaction with the biosphere, and with the oceans. And that is a much bigger modeling problem-to be successful-than just the atmosphere alone. But if we do wait, then the problem of reversing the trends that have already been in place for a few decades becomes much more severe.

So, faced with what the scientific community says here as an assessment, and what I, as an individual see, looking at the scientific record, I still have a tricky decision. If I make my own personal assessment, which is similar to the one the political system has to make, my assessment would be that if we were a wise society, we would take steps now to reduce the long-term impact. Because it is not so much the impact on our own society, and our own agriculture, over which we have some control. It is the impact on the natural ecosystems.

If I might make just one quick other remark. James Lovelock is the man who introduced the Gaia hypothesis some years ago. He drew a loose analogy between the attitude of the Victorians when they discovered the beginnings of germ theory. They looked at their cities. And they realized that some of the health problems they were faced with in their urban areas were due to just bad urban sanitation. They did not wait a century or so, first, to work out all the details of the biochemistry of all the diseases, which we are still in the progress of doing. They had a certain humility, and went about cleaning up the cities. I believe he was talking about London. And in the process they wiped out all sorts of health problems, many of which they did not know anything about.

We probably are faced with a similar situation with the global climate system. We need to clean up our emissions. It is not just the things that we understand, or we think we understand. It is all the surprises that lie along the way, particularly in terms of interaction with the biosphere, coupled with the impact that we are having on the forest ecosystems, just because of our civilization.

My general conclusion is, again, that if we were wise, we would slow down and do what we can to minimize the impact. It buys us some more time. It buys us time for our observational and theoretical studies. And in the process, we will minimize the climatic impact-whatever it is.

Senator GORE. I would like to shift gears, in the short time we have remaining. Thank you, Dr. Betts.

*(P91-92)* Senator GORE. Now, last, I think we can all agree that we have a very important problem to address here, that many of you have devoted many years of your lives to it. I want to thank all of you for sharing in this discussion today. I just hope that in the next few years, there can be as much progress in the political arena, as there has been in the scientific arena. We cannot wait until we have all the answers. I want to identify with the eloquent statement of Dr. Betts on that particular point-and others, I might say. You just do not wait until you know when your house will bum down in order to buy fire insurance. And I do not think we can afford to wait until all of the uncertainties have been removed before we decide it is time to take steps to stop this dramatic and unprecedented increase in the greenhouse gases. But improving our knowledge base is the place to start. And I appreciate all of you helping in that task today. Thank you very much.

[Whereupon, at 1:13 p.m., the committee adjourned.]