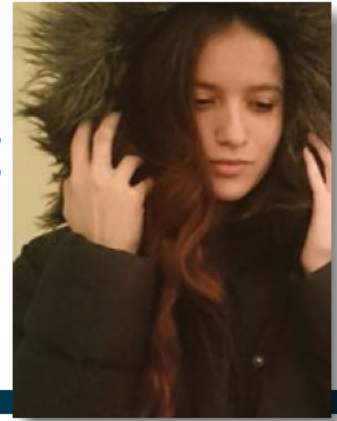


Dr. James Hansen, Climate Change, and the Need to Act: 1988...now

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Few scientists seek celebrity status. Fewer attain it. Dr. James Hansen is one scientist in the climate change field who certainly has attained celebrity. For more than thirty years Hansen was the director of the NASA Goddard Institute for Space Studies. Quite early in his NASA years Hansen testified before the U.S. Senate Committee on Energy and Natural Resources. He startled Senators with the conclusion from his research that he was virtually 100 percent certain that the global warming trend he was invited to testify about was man-made. It was due to the build-up of carbon dioxide and other “greenhouse” gases in the atmosphere.

The world then, 28 years ago now, was warmer than at any time in the history of our ability to measure temperatures. Hansen then had “a high degree of confidence” that the greenhouse effect was responsible for this warming (so did the other scientists appearing before the committee). He warned the committee members that this effect already was significant enough to increase the probability of extreme weather events.

When Hansen and his colleagues made their appeal to a Congressional committee in 1988 they hoped the Senators would accept their information and act on it. Dr. George Woodwell, director of the famous Woods Hole Research Center, and other witnesses said that planning needed to begin to reduce sharply the burning of fossil fuels. Reforestation efforts also were urged upon the Senators since trees absorb and store carbon dioxide.

Some Senators accepted Hansen’s science and called for action to reduce emissions and adapt to a changing climate; more Senators refused to listen to the testimony and evidence. Although we’ve had many more “warmest years ever” since then the U.S. Congress, like the Canadian Parliament, has refused to respond positively to the scientists’ call for legislation to address a changing climate.

Jump ahead to 2015. Hansen continues his quest to use science to persuade us that we must act immediately to reduce greenhouse gas emissions. There’s an important difference though between today’s efforts and those of 1988. Hansen’s appeal now is made much more directly to the people.

In spring of 2015, Dr. Hansen released a paper with 18 international coauthors directly to the internet. Under public scrutiny, his paper made headlines and flew onto the desktops of believers and non-believers, policy-makers and constituents. It opened a discussion not only about the content of the paper but on the entire scientific process, including publication and peer review. When faced with what he felt was an urgent need to act Hansen released his findings – this time to the world at large rather than to select members of the U.S. Congress.

The core of Hansen’s message and information has remained the same: the climate on planet Earth is changing. That means that all the weather we observe, every day, every year, over the course of decades, is going to be different in significant ways. And, he is saying this change has been

caused by human activity.

Soon after, the paper, titled “Ice melt, sea level rise and superstorms: evidence from paleoclimatic data, climate modeling, and modern observations that 2°C global warming could be dangerous” got through the scientific peer review process (in which other scientists, whose privacy is protected to ensure non-biased feedback, repeatedly comb through all 50 pages of methods, results, and discussions). The paper was published in *Atmospheric Chemistry and Physics* on March 22, 2016. Its most controversial claim may be that an abrupt shift in the climate may just be decades, not centuries, away. The polar ice sheets will melt much more rapidly than most projections suggest and the earth’s coastal cities would be submerged in less than 100 years.

Hansen and his co-authors took two paths to reach their very worrying conclusion. First, they looked through the history of our planet to find that, once upon a time but not too long ago, the Atlantic Ocean was the stage for massive superstorms that lifted, carried, and dumped boulders onto Caribbean Islands. Second, they included the critical circulation in the Atlantic Ocean in their model in order to account for the complex mixing of water based its density and temperature.

Hansen and his colleagues hope the public will actually respond to this extremely worrying conclusion and push governments to act. The Paris climate change agreement signed last December identified the need to limit the increase in global average temperature to less than 2°C but,

as the text box underlines, acknowledged that the policy commitments so far made will not deliver that objective. If immediate action isn't taken many of the world's great cities, with all their histories, will find themselves under water by the end of the century. 🌊

Emphasizing with serious concern the urgent need to address the significant gap between the aggregate effect of Parties' mitigation pledges in terms of global annual emissions of greenhouse gases by 2020 and aggregate emission pathways consistent with holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C

- excerpt from the Paris Agreement on Climate Change, December 12, 2015.