

# National Assessment of the Potential Impact of Climate Change: Climate Change Impacts on the United States

Hearing before the Senate Committee on Commerce, Science, and Transportation

Testimony of Prof. S. Fred Singer

President, The Science & Environmental Policy Project

July 18, 2000

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Mr. Chairman, Ladies and Gentlemen,

My name is Fred Singer. I am Professor emeritus of Environmental Sciences at the University of Virginia and the founder and president of The Science & Environmental Policy Project (SEPP) in Fairfax, Virginia, a non-partisan, non-profit research group of independent scientists. We work without salaries and are not beholden to anyone or any organization. SEPP does not solicit support from either government or industry but relies on contributions from individuals and foundations.

We hold a skeptical view on the climate science that forms the basis of the National Assessment because we see no evidence to back its findings; climate model exercises are NOT evidence. Vice President Al Gore keeps referring to scientific skeptics as a "tiny minority outside the mainstream." This position is hard to maintain when more than 17,000 scientists have signed the Oregon Petition against the Kyoto Protocol because they see "no compelling evidence that humans are causing discernible climate change."

Others try to discredit scientific skeptics by lumping them together with fringe political groups. Such ad hominem attacks are deplorable and have no place in a scientific debate.

To counter such misrepresentations, I list here qualifications relevant to today's hearing.

## Relevant Background

I hold a degree in engineering from Ohio State and a Ph.D. in physics from Princeton University. For more than 40 years I have researched and published in atmospheric and space physics. I received a Special Commendation from President Eisenhower for the early design of satellites. In 1962, I established the U.S. Weather Satellite Service, served as its first director, and received a Gold Medal award from the Department of Commerce for this contribution.

Early in my career, I devised instruments to measure atmospheric parameters from satellites. In 1971, I proposed that human production of the greenhouse gas methane, through cattle raising and rice growing, could affect the climate system. This was also the first publication to discuss an anthropogenic influence on stratospheric ozone. In the late 1980s, I served as Chief Scientist of the Department of Transportation and also provided expert advice to the White House on climate issues.

Today, by presenting evidence from published peer-reviewed work, I will try to rectify some erroneous claims advanced at the May 17 NACC hearing.

## 1. There is no Appreciable Climate Warming

Contrary to the conventional wisdom and the predictions of computer models, the Earth's climate has not warmed appreciably in the past two decades, and probably not since about 1940. The evidence is overwhelming:

- a) Satellite data show no appreciable warming of the global atmosphere since 1979. In fact, if one ignores the unusual El Nino year of 1998, one sees a cooling trend.
- b) Radiosonde data from balloons released regularly around the world confirm the satellite data in every respect. This fact has been confirmed in a recent report of the National Research Council/National Academy of Sciences [1].
- c) The well-controlled and reliable thermometer record of surface temperatures for the continental United States shows no appreciable warming since about 1940.[See figure] The same is true for Western Europe. These results are in sharp contrast to the GLOBAL instrumental surface record, which shows substantial warming, mainly in NW Siberia and subpolar Alaska and Canada.

d) But tree-ring records for Siberia and Alaska and published ice-core records that I have examined show NO warming since 1940. In fact, many show a cooling trend.

Conclusion: The post-1980 global warming trend from surface thermometers is not credible. The absence of such warming would do away with the widely touted "hockey stick" graph (with its "unusual" temperature rise in the past 100 years) [see figure]; it was shown here on May 17 as purported proof that the 20th century is the warmest in 1000 years.

## **2. Regional Changes in Temperature, Precipitation, and Soil Moisture?**

The absence of a current global warming trend should serve to discredit any predictions from current climate models, including the extreme warming from the two models (Canadian and British) selected for the NACC.

Furthermore, the two NACC models give conflicting predictions, most often for precipitation and soil moisture [2,3]. For example, the Dakotas lose 85% of their current average rainfall by 2100 in one model, while the other shows a 75% gain. Half of the 18 regions studied show such opposite results; several others show huge differences. [see graph]

The soil moisture predictions also differ. The Canadian model shows a drier Eastern US in summer, the UK Hadley model a wetter one.

Conclusion: We must conclude that regional forecasts from climate models are beyond the state of the art and are even less reliable than those for the global average. Since the NACC scenarios are based on such forecasts, the NACC projections are not credible.

## **3. Sea Level Rise: Controlled by Nature not Humans**

The most widely feared and also most misunderstood consequence of a hypothetical greenhouse warming is an accelerated rise in sea levels. But several facts contradict this conventional view:

a) Global average sea level has risen about 400 feet (120 meters) in the past 15,000 years, as a result of the end of the Ice Age. The initial rapid rise of about 200 cm (80 inches) per century gradually changed to a slower rise of 15-20 cm (6-8 in)/cy about 7500 years ago, once the large ice masses covering North America and North Europe had melted away. But the slow melting of the West Antarctic Ice Sheet continued and will continue, barring another ice age, until it has melted away in about 6000 years.

b) This means that the world is stuck with a sea level rise of about 18 cm (7 in)/cy, just what was observed during the past century. And there is nothing we can do about it, any more than we can stop the ocean tides.

c) Careful analysis shows that the warming of the early 1900s actually slowed this ongoing SL rise [4], likely because of increased ice accumulation in the Antarctic.

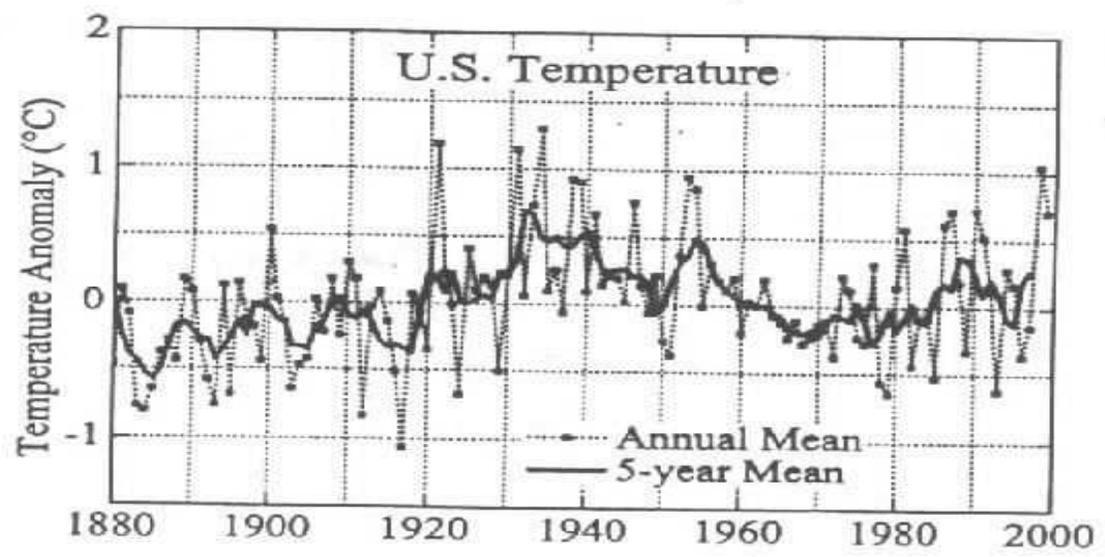
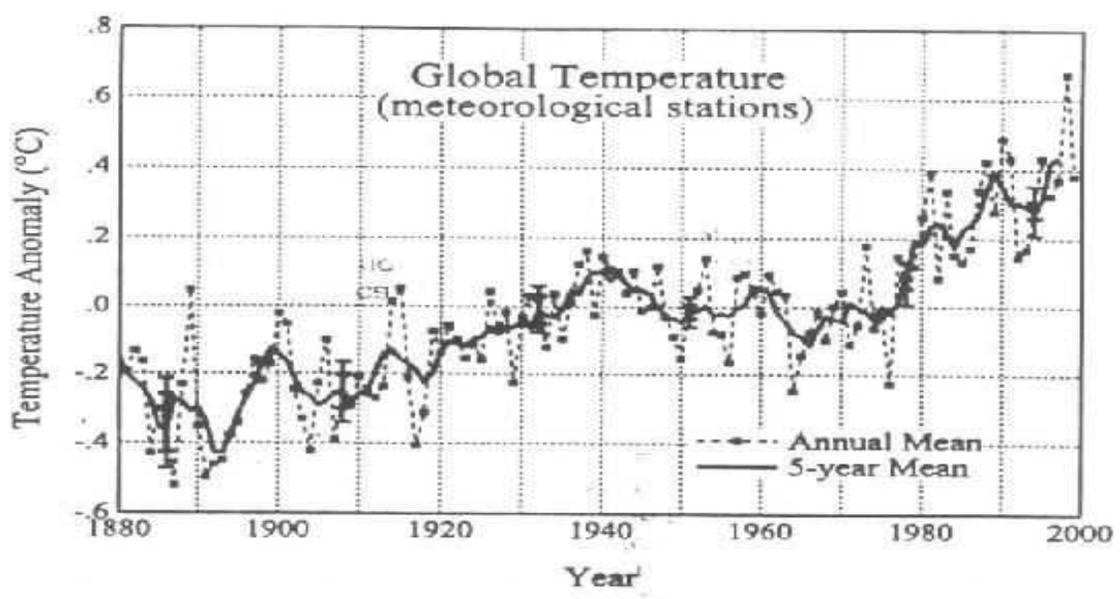
**The bottom line:** Currently available scientific evidence does not support any of the results of the NACC, which should therefore be viewed merely as a "what if" exercise, similar to the one conducted by the Office of Technology Assessment in 1993 [5]. Such exercises deserve only a modest amount of effort and money; one should not shortchange the serious research required for atmospheric and ocean observations, and for developing better climate models.

The NACC should definitely NOT be used to justify irrational and unscientific energy and environmental policies, including the economically damaging Kyoto Protocol. These policy recommendations are especially appropriate during the coming presidential campaigns and debates. I respectfully request that an expanded exposition [6] be made part of my written record.

1. National Research Council. "Reconciling Temperature Trends" National Academy Press, Washington, DC. January 2000
2. R. Kerr. "Dueling Models: Future U.S. Climate Uncertain." Science 288, 2113, 2000
3. P.H. Stone. "Forecast Cloudy: The Limits of Global Climate Models." Technology Review (MIT), Feb/March 1992. pp.32-40.
4. S.F. Singer. Hot Talk, Cold Science: Global Warming's Unfinished Debate. (The Independent Institute, Oakland, CA. (second edition, p. 18).

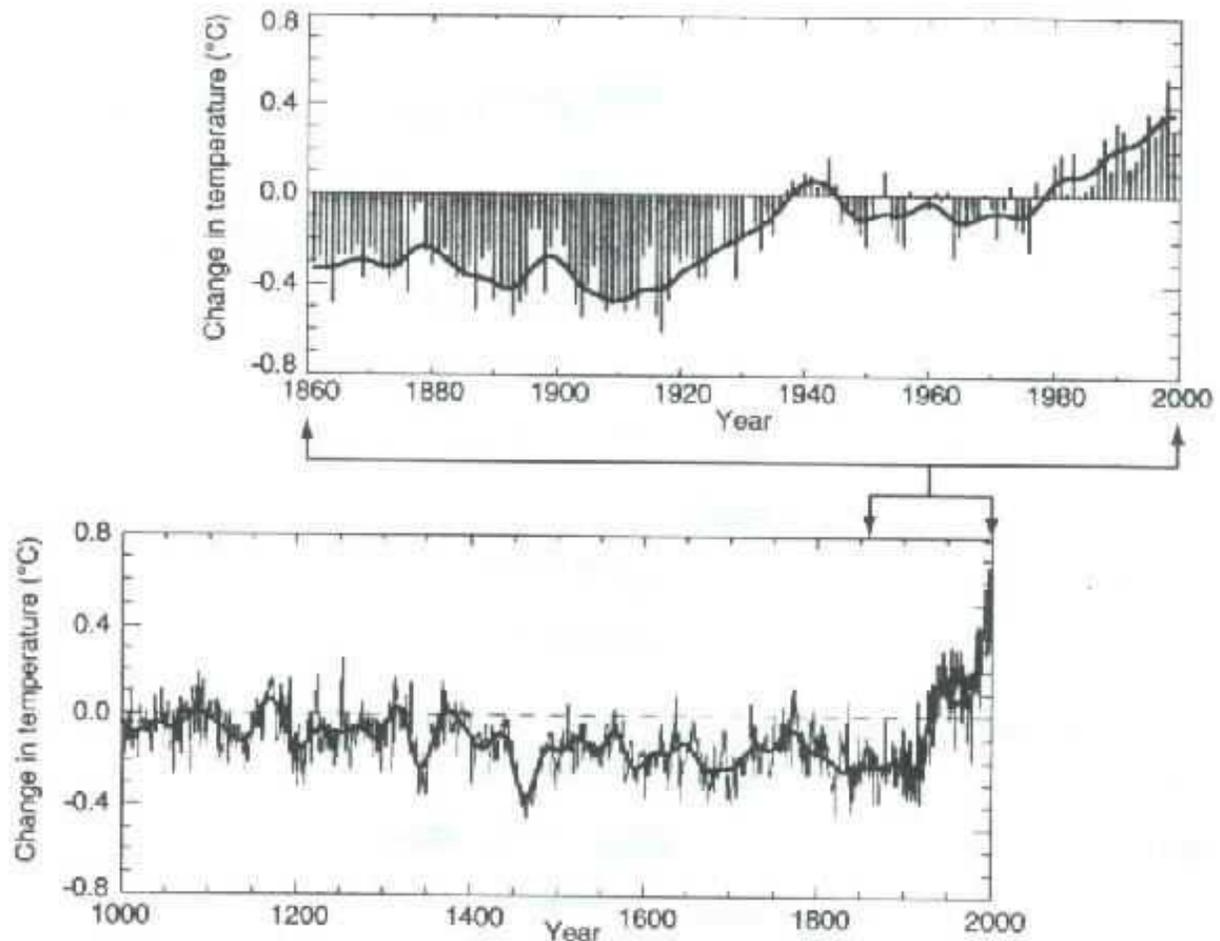
5. Office of Technology Assessment. "Preparing for an Uncertain Climate" Govt. Printing Office, Washington, DC. 1993

6. S.F. Singer. "Climate Policy-From Rio to Kyoto: A Political Issue for 2000-and Beyond" Hoover Institution Essay in Public Policy No. 102. Stanford, CA, 2000.



## Figures

## Variations of the Earth's surface temperature for the past 1000 years



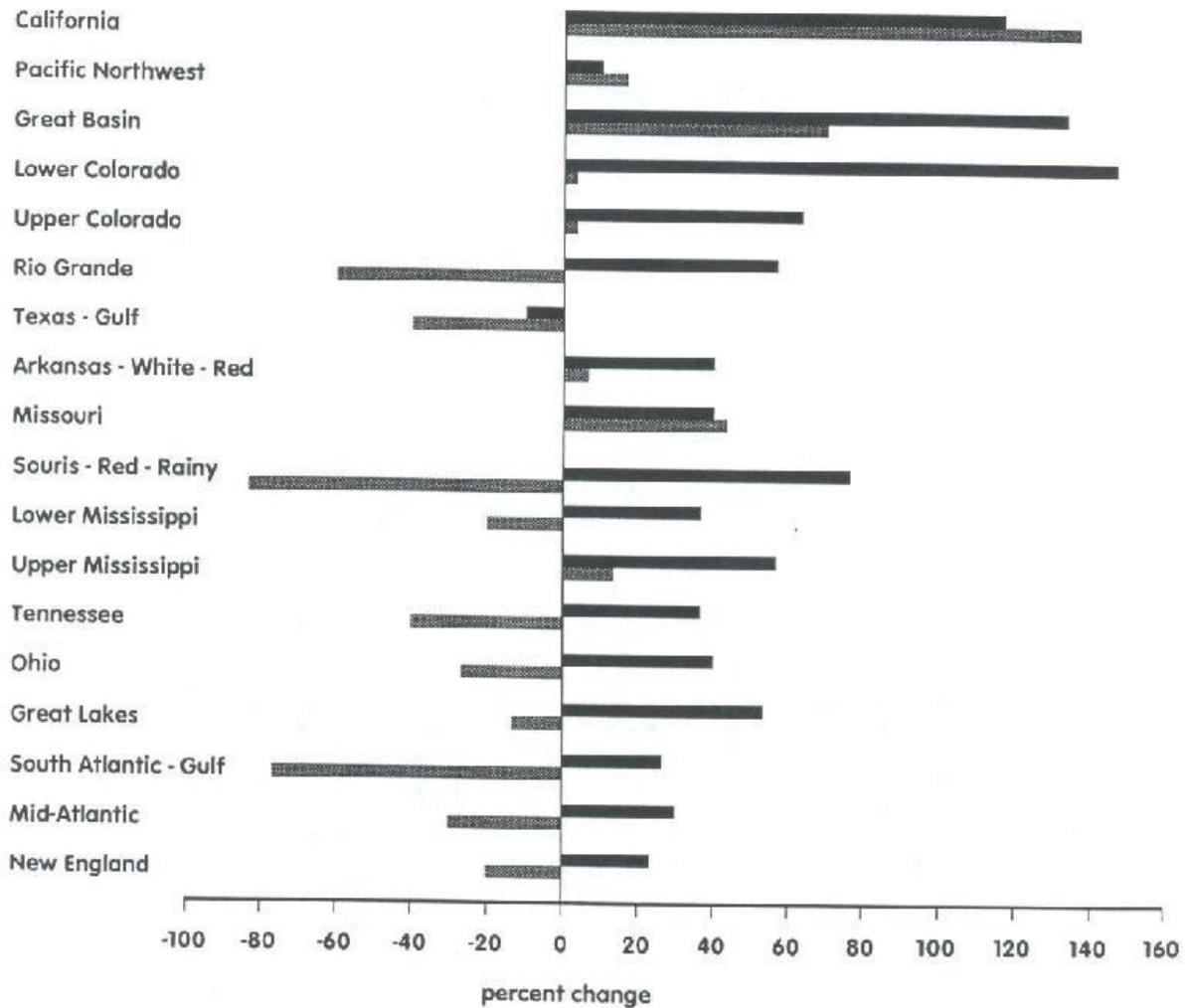
**Figure 1: Global mean surface temperatures** vary year by year and decade by decade. However, the warming during 20<sup>th</sup> Century has been atypical compared to the rest of the past 1,000 years. The rate and duration of the warming is likely to have been the largest of the period. The 1990s is likely to have been the warmest decade in the millennium in the Northern Hemisphere, and 1998 is likely to have been the warmest year.

“Hockey-stick” temperature graph (Mann, Bradley, and Hughes, *Geophysical Research Letters* 1999), used to back the claim that the 20<sup>th</sup> century was the warmest in 1000 years and that the 1990s were the warmest decade (as reproduced in the Summary for Policymakers of the IPCC-Third Assessment Report)

The graph is actually a composite of two records: temperatures from “proxy” data (tree rings, etc) superimposed on the global instrumental (thermometer) record of the past century.

Close examination reveals that the proxy record stops in 1980 and therefore does not independently support the post-1980 temperature increase suggested by the thermometer data. Thus there is no evidence for a substantial warming since 1980 (or even 1940)

### Percent Change in Predicted Rainfall – 1990 to 2090 – Two Climate Models



## NEWS RELEASE

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July 18, 2000 703-698-6171

# Representative of 17,000 skeptics testifies on climate change to US Senate

Dr. S. Fred Singer and other climate scientists made a convincing case that the earth's atmosphere is not warming and that fears about human-induced storms, sea-level changes, and other disasters are misplaced. Singer testified about the National Assessment of Climate Change (NACC) impacts on the United States before the Senate Committee on Commerce, Science and Transportation, chaired by Senator John McCain.

"I am skeptical about the climate science that forms the basis of the NACC, because there is virtually no evidence to back up its findings," Singer said. "Climate model exercises are NOT evidence."

Vice President Al Gore frequently calls scientific skeptics of global warming "a tiny minority outside the mainstream." However, more than 17,000 scientists - many of them climate and atmospheric experts - have signed the Oregon Petition against the Kyoto Protocol because they see "no compelling evidence that humans are causing discernible climate change," Singer noted.

The climate change debate has been raging within the scientific community since the mid-1970s. According to an April 1975 Newsweek article, "There are ominous signs that the Earth's weather patterns have begun to change dramatically," and scientists are "almost unanimous in the view that the trend will reduce agricultural productivity for the rest of the century," because average temperatures in the Northern Hemisphere are cooling. Many of these scientists worried then that the world was heading into a new ice age, like the one that ended 15,000 years ago.

What are the facts today? As Singer demonstrated with actual data:

1. There is no appreciable climate warming today. "Contrary to the conventional wisdom and the predictions of computer models, the Earth's climate has not warmed appreciably in the past two decades, and probably not since about 1940. The evidence for this is abundant," Singer said.

Satellite data show no appreciable warming of the global atmosphere since 1979. In fact, if one ignores the unusual El Nino year of 1998, one sees a cooling trend. Radiosonde data from balloons released regularly around the world confirm the satellite data in every respect. A January 2000 report by the National Research Council/National Academy of Sciences concurs.

Surface temperature data from reliable, well-controlled stations in the continental U.S. likewise show no appreciable warming since about 1940. The same is true for Western Europe.

These results are in sharp contrast to the GLOBAL instrumental surface record, which shows substantial warming, mainly in NW Siberia and sub-polar Alaska and Canada. But tree-ring records for Siberia and Alaska and published ice-core records show NO warming since 1940. In fact, many show a cooling trend. "In short, global warming claims based on surface thermometers are simply not credible," Singer concluded.

2. Predicted regional temperature and precipitation changes cannot be trusted. The two climate models selected by the NACC team predict extreme warming of 5-10° F over the next century. But they are contradicted by actual evidence, and by nearly all other climate models.

The two NACC models also give wildly conflicting regional predictions. For example, the Dakotas lose 85% of their current average rainfall by 2100 in one model, while the other shows a 75% gain. Half of the 18 regions studied show such opposite results; several others show huge differences. These regional forecasts from climate models form the basis for all the NACC's dire warnings. But they are even less reliable than those for the global average.

3. Predictions about sea level rise have no basis in sound science. The NACC also predicts an accelerated rise in sea levels. Sea levels have risen about 400 feet in the past 15,000 years, following the end of the last Ice Age. Once the large ice masses covering North America and North Europe melted away, the initial rapid rise of about 80 inches a century gradually changed to 6-8 inches a century

for the past 7500 years. But the West Antarctic Ice Sheet has continued to melt and, barring another ice age, will continue to do so for another 6000 years.

This means that the world is stuck with a sea level rise of about 7 in/cy, just what was observed during the past century. And there is nothing we can do about it, any more than we can stop the ocean tides.

The bottom line: Currently available scientific evidence does not support any of the results of the NACC, which should therefore be viewed merely as "what-if" exercises. Such exercises deserve only a modest amount of effort and money; one should not shortchange the serious research required for atmospheric and ocean observations, and for developing better climate models.

"The NACC should definitely NOT be used to justify hasty, irrational and unscientific energy and environmental policies, including the economically damaging Kyoto Protocol. This advice should be kept in mind during the coming presidential campaigns and debates," Singer concluded.

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Singer holds a degree in engineering from Ohio State and a Ph.D. in physics from Princeton University. He received a Special Commendation from President Eisenhower for the early design of satellites. In 1962, he was selected as first director of the U.S. Weather Satellite Service and received a Gold Medal award from the Department of Commerce for this contribution. In the late 1980s, he served as Chief Scientist of the Department of Transportation and also provided expert advice to the White House on climate issues.

The Science & Environmental Policy Project ([www.sepp.org](http://www.sepp.org)) is a non-partisan, not-for-profit, privately funded research organization, devoted to the use of sound science in public-policy decisions. SEPP president Dr. S. Fred Singer is professor emeritus of environmental sciences at the University of Virginia and a developer of the U.S. weather satellite program.

Today's hearing was called in part to correct misconceptions left by a May 17 hearing, that climate science is "settled" and that there is serious danger of impending climate catastrophes.

