

Kuehnast Lecture Series

Tenth Annual Lecture

October 11, 2002

Global Climate Change: Uncertainties, Risks, and Values in Determining Public Policy

Promoting Science, Citizenship, and Civility on the Issue of Climate Change

On October 11, 2002 the Tenth Anniversary Kuehnast Lecture Program (co-sponsored by the University of Minnesota Kuehnast Endowment and Sigma Xi Chapter) brought together a group of scientists to share their expertise in a half-day forum titled, "Global Climate Change: Uncertainties, Risks, and Values in Determining Public Policy." The panel consisted of five scientists with impeccable professional credentials: Dr. Richard Lindzen, Sloan Professor of Meteorology at M.I.T.; Dr. Dennis Hartmann, Chair of the Department of Atmospheric Sciences at the University of Washington; Dr. Benjamin Santer of the Program for Climate Model Diagnosis and Intercomparison at the Lawrence-Livermore National Laboratory; Dr. Michael Glantz, Climate Affairs Director at the National Center for Atmospheric Sciences; and Dr. Vern Ruttan, Regents Professor Emeritus at the University of Minnesota Department of Economics and Applied Economics.

This event was open to the public and held at the University of Minnesota McNamara Alumni Center in Minneapolis, MN. Attendance was well over 300 people, including scientists, students, state and federal employees, and business leaders from the greater Minnesota community. In the absence of politics and environmental lobbying, the presentations and follow-up discussion were honest, scientifically insightful, at times contentious, but very respectful. Certain perspectives were commonly held by the panelists: (1) that ascribing specific and proportional causality (natural fluctuation, land-use changes or anthropogenic emission of greenhouse gases) to climate change remains a formidable task; (2) that regional climate changes are already more profound than overall global change; (3) that public policy preferences need to be disentangled from the notion of eliminating uncertainty from climate science; (4) that improvements in resolving sensitivity to climate forcings (the feedbacks are more uncertain) will require considerable more research investment; (5) that despite improvements in climate models over the past two decades, there is a need for a world-wide climate observing system; (6) that climate, society, and the environment are irrevocably linked and might be approached academically through the emerging discipline of Climate Affairs; and finally, (7) that the developing countries of the world lack the infrastructure and resources for adaptation or mitigation when it comes to climate change, and that as a result an equity issue will continue to arise in negotiating international agreements.

All participants agreed that this forum performed a valuable public education service by providing a neutral setting to explore the scientific (cognitive), emotional, and ethical dimensions of climate change. Too often scientists are expected to focus or limit their remarks to knowledge gained by measurement analysis, experimentation, or model and hypothesis testing. On critical scientific issues, the certainty or uncertainty of this cognitive dimension of science interacts with the emotional or ethical perceptions (sometimes due to exposure by the media). A better public service is provided if scientists are allowed to fully engage in discussions that not only mine their knowledge, but explore risks and values perceived by the public. Sigma Xi chapters are encouraged to support such public forums on critical science issues.

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(Program synopsis from the Sigma Xi website: <http://www.sigmaxi.org>)

Dr. Lindzen has focused his research on the dynamics of the earth's climate and its atmosphere's general circulation, the middle atmosphere, and planetary atmospheres. He has contributed to the theory of hydrodynamic instabilities and waves, and provided explanations for a variety of atmospheric phenomena including atmospheric tides, quasi-biennial oscillation of the tropical stratosphere, and the generation of upper atmospheric turbulence by breaking internal gravity waves. His current work is focused on climate sensitivity of the earth to radiative forcing and on factors which determine the equator-to-pole temperature differences.

Dr. Hartmann's research has concentrated on large-scale dynamics of the earth's climate system, including transport properties of the stratosphere and interactions of the atmosphere and oceans. More recently he has investigated climate change and climate feedback processes involving clouds and water vapor with attempts to account for radiative, dynamical, and cloud-physical processes.

Dr. Santer is an expert on the detection of climate change and contributed to all three Assessment Reports (1990, 1995, and 2001) by the Intergovernmental Panel on Climate Change. In fact he was convening lead author for Chapter 8, *Detection of Climatic Change, and Attribution of Causes*, of the 1995 IPCC Report. His research is highly focused on the identification of human-induced climate change in observational data and evaluation of climate model performance.

Dr. Glantz is interested in how climate affects society and how society affects climate, especially how the interaction between climate anomalies and human activities affect quality of life issues. His research has focused on African drought, desertification, and food production problems; societal impacts of ENSO related climate anomalies; methods of forecasting possible societal responses to regional impacts of climate change; and the use of climate-related information for economic development.

Lecture Program

Dr. Mark Seeley	Professor	Dept. of Soil, Water, & Climate
Dr. Alan Shapiro	Professor, History of Science & Technology President, Sigma Xi Chapter	
Dr. Ed Nater	Head, Dept. of Soil, Water, & Climate	
Regent Robert Bergland	Vice Chair, Board of Regents, Univ. of Minnesota	
Dr. Vern Ruttan - Moderator	Regent's Professor Emeritus Department of Economics and Applied Economics University of Minnesota	
Dr. Richard Lindzen	Alfred P. Sloan Professor of Meteorology Massachusetts Institute of Technology	
Dr. Dennis Hartman	Chair, Dept. of Atmospheric Sciences University of Washington	
Dr. Ben Santer	Earth and Environmental Sciences Directorate Lawrence-Livermore National Laboratory	
Dr. Michael Glantz	Climate Affairs Director National Center for Atmospheric Research	
Discussion -- Questions and Answers Additional comments from presenters. Questions and Answers with audience directed by Dr. Ruttan		