Center for Science and Technology Policy Research

Annual Report

July 1, 2001 — June 30, 2002

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Center for Science and Technology Policy Research

Message From The Director

On June 17, 2001 an article in The New York Times reported, "some experts believe that science's influence in public policy matters has not been at such a low ebb since before World War I." The statement reflects a widely shared view that while science and technology hold great promise for contributing to societal needs, meeting that promise requires thoughtful attention to how science and technology relate to decision making. In the summer of 2001, the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado (CU) initiated development of a new Center for Science and Technology Policy Research.

The Center's emphasis on "policy" recognizes that a focus on decision making processes is essential to understand and more effectively link science and technology with societal needs. The Center's distinction between " policy research" and "policy" is much like the distinction between "weather forecasting research" and "weather forecasting." The Center does not intend to reproduce the considerable capabilities of advocacy groups, think tanks and other organizations who seek to develop, propose and advocate specific policies. Instead, our focus is on developing research expertise at the interface of decision making and science and technology, in order to better understand those situations in which information can and cannot contribute to decision making processes, and to produce and share usable information with those involved in decision making related to science and technology.

We believe that a focus on "science and technology policy research" makes the Center unique in the United States. Over the coming years we look forward to expanding our research, education and outreach capabilities in support of our mission:

> ***The mission of the Center for Science and Technology Policy Research is research and education at the interface of science and decision making.***

We look forward to partnering with those in academia, and public, private and non-governmental settings in the United States and beyond who share our vision of improving the ability of science and technology to contribute to societal needs. Events of the past year such as the tragic terrorist attacks in New York and Washington, a debilitating drought in the inter-mountain West, and debate over biotechnology capabilities illustrate the critical need to make the most out of the nation's significant investment in its science and technology infrastructure. Our work over the past year is intended as a contribution to that end. This Annual Report provides a snapshot of our efforts during 2001 - 2002. Please have a look. We welcome your feedback (pielke@colorado.edu).

CIRES

Roger A. Pielke, Jr., Director

An Initial Vision for the CIRES Center for Science and Technology Policy Research at the University of Colorado-Boulder

Introduction

The last decade has seen a growing demand by public and private decision makers for "usable" scientific information. Such information can serve decisions that have a scientific component or decisions about the structures, organizations, and priorities of science itself. An area of inquiry that seeks to meet this growing demand for information is science and technology policy research. Such research focuses on "problems" and "decisions" (or more accurately, "decision processes") as the units of analysis with an explicit objective of providing information that is useful and relevant in decision making. It is the focus on problems and decisions that sets science and technology policy research apart from other efforts to integrate knowledge across traditional disciplines.

Because problems and decisions are not bounded by any discipline or set of disciplines, science and technology policy research is necessarily integrative across the physical, social, and biological sciences (as well as other fields, including the humanities). The specific decision or problem that is the focus of inquiry dictates the sort of knowledge that is relevant to the research.

The recent decade also has seen growing interest among scientists in research problems that require the input of more than just a single traditional discipline. At the same time, both public and private sector decision makers have asked the science and technology communities to provide knowledge that is more directly useful in their decision making. Science and technology policy research provides a mechanism to reconcile these two closely related – but not identical – trends. By linking integrative science with the needs of decision makers, science and technology policy research can serve a valuable role in helping the research community better focus its efforts on issues of importance to society, and decision makers can more effectively incorporate scientific and technological advances into their decision processes.

Science and technology policy research depends critically upon cutting edge research in a variety of fields – climatology, hydrology, geography, sociology, economics, political science, etc. It also depends upon innovative approaches to multidisciplinary research in order to integrate knowledge from these areas in a way that directly contributes useful information to decision makers. An explicit focus on science and technology policy research can contribute needed expertise and perspective in the quest for scientific and technical knowledge usable by decision makers.

An Overview of the Center

The Center for Science and Technology Policy Research was initiated within CIRES at the University of Colorado-Boulder in the summer of 2001 as a contribution to both the CIRES theme "promoting science in service to society" and the University's vision of establishing research and outreach across traditional academic boundaries. Our long-term vision is to become a center of excellence in the research community and a national and international leader in research, teaching, and outreach in science and technology policy research, and more specifically in the areas of science policy, technology policy, and technology assessment. To work toward this vision the Center has adopted the following as its mission statement:

> The recent decade has seen growing interest among scientists in investigating research problems that require the input of more than just a single traditional discipline. At the same time, decision makers in both public and private settings have asked the science and technology communities to provide knowledge that is more directly usable in their decision making. Science and technology policy research provides a mechanism to reconcile these two closely related - but not identical - trends. By linking integrative science with the needs of decision makers, science and technology policy research can serve a valuable role in helping the research community better focus its efforts on issues of importance to society, and in helping decision makers to effectively incorporate scientific and technological advances into their decision processes. **The mission of the Center for Science and Technology Policy Research is research and education at the interface of science and decision making.**

Research

The Center's research is highly integrated with the ongoing activities of CIRES, the National Oceanic and Atmospheric Administration, the University, and the broader science and technology community. Each of these areas is described below:

- Science policy. The traditional scholarly interest in science policy has for many years been captured by the phrases "science for policy" and "policy for science." The Center will explore how scientific information is linked to decision making and will also examine governance of the scientific enterprise with topics that range from broad federal government resource allocation issues to the practice of peer review.
- Technology policy. Technology policy refers to the interrelationship of government, academia, and the private sector, and their shared goal of enhancing economic vitality through the transfer of knowledge to useful products and processes. Technology policy research seeks to understand these relationships and to develop, evaluate, and critique them.
- Technology assessment. Technology assessment seeks to integrate knowledge of technological systems with their broader social and policy context as a contribution to the governance of science and technology. Decisions about how to allocate finite (and frequently scarce) resources can be made more effectively when decision makers consider integrated understandings of technology in society.

Education

In partnership with University departments in the social and physical sciences, law, humanities, engineering, and other areas, the Center seeks to develop a pedagogical presence at both undergraduate and graduate levels. Courses that the Center has or may participate in include focused seminars in policy research and methodology, cross-disciplinary courses in science policy, and topical courses designed to focus on the specific science and technology policy research issues of particular relevance to certain disciplines.

The Center seeks to develop internship programs that involve partners in both public and private settings, as well as a visitor program that brings people from those settings into the University environment. The Center will pay particular attention to issues of diversity – both in traditional and non-traditional terms – in its activities as it seeks to bring together people and communities in ways that cross traditional boundaries.

Outreach

The Center emphasizes outreach to the academic community and to private and public decision makers. It works closely with CIRES and University public outreach and education efforts. The Center seeks to make extensive use of the WWW in its outreach and community-building efforts. In January 2002 the Center initiated a newsletter – called Ogmius -- that includes an exchange among leading voices in the science and technology policy community, updates on Center projects and websites, recent Center publications, web and media resources, information about educational and other science and technology policy opportunities and meetings, and other news and information of interest to the community. It sponsors several email list-servs and leads a monthly forum for graduate students and early career scientists interested in science and technology policy that features a guest speaker.

Management

In 2002, the Center achieved a critical mass of administrative support that will facilitate and allow continued enhancement of the Center's depth and breadth in areas of expertise and practice in support of its mission and vision. Considerable details about the Center's management structure can be found in the Program Plan included in the Appendix to this 2001-2002 Annual Report. The Center Director leads Center development under the guidance of CIRES leadership. The Center Director provides overall direction for research, teaching, and outreach, and for reporting on Center activities. The Center also employs a Managing Director whose activities include Center administration, as well as research and research support. An office manager oversees day-to-day operations. All Center staff play a role in setting research, teaching, and outreach agendas. The Center seeks to create innovative mechanisms to facilitate participation in Center activities by faculty and professionals from all University of Colorado campuses, other higher educational institutions, government agencies, and the private sector.

Aspen Program

http://sciencepolicy.colorado.edu/aspen/index.html

The Atmospheric Sciences Policy Education and Network (ASPEN) Program is focused on weather policy research, education, and outreach. It is supported by the U.S. Weather Research Program. The ASPEN Program includes research, education, and outreach.

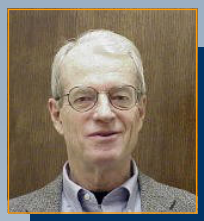
Research conducted by the ASPEN Program relates to weather impacts, use and value of weather forecasts, and weather policy. Publications supported wholly or in part by the ASPEN program include:

- Klein, R.A. and R.A. Pielke, Jr., 2002: Bad Weather? Then Sue the Weatherman! A review of legal liability for predictions and forecasts: Part I, Public Sector, Bulletin of the American Meteorological Society (in press).
- Klein, R.A. and R.A. Pielke, Jr., 2002: Bad Weather? Then Sue the Weatherman! A review of legal liability for predictions and forecasts: Part II, Private Sector, Bulletin of the American Meteorological Society (in press).
- Pielke, Jr., R. A. 2002. Reducing vulnerability to hurricanes. Chapter 7 in R. Anthes, R. Simpson, and M. Garstang (eds.). Coping with hurricanes: A review of 20th century progress, (AGU: Washington, DC) (in press).
- Pielke, Jr., R. A., and R. Carbone, 2002: Weather Forecasts, Impacts and Policy: An Integrated Perspective, Bulletin of the American Meteorological Society.

With the development of the Environmental Studies graduate program at the University of Colorado, students have a new opportunity to conduct post-graduate studies at the interface of the atmospheric sciences and policy research.

The ASPEN Program has sought to develop community resources for those interested in the interface of weather and society. Our outreach efforts include the WeatherZine, Societal Aspects of Weather Web Portal, Extreme Weather Sourcebook, Use and Value of Weather and Climate Forecast Bibliography, and Weatherpolicy listserv.

Staff Highlight
Rad Byerly



On April 17, 2002 Rad Byerly testified before the Science Committee of the U.S. House of Representatives at a hearing on "New Directions for Climate Research and Technology Initiatives." Byerly was asked to address two questions: Are our climate programs focused on the right questions? And, How could a new climate research initiative best be focused to yield shorter-term climate and weather information of greater relevance to local end-users? Byerly answered that research is not now focused on the right questions because it is not focused on the concerns of users. This points to the answer to the second question, the programs must take steps to identify these users, find out what they need – e.g., what decisions do they face today, and structure research programs that will deliver information today. The current program has had great scientific success but is too focused on long-term scientific questions. Much is already known that could be applied by today's users to the decisions they face now, but there is little connection between research and users. Byerly also made legislative suggestions to implement programs that would generate usable information and get it to users. A key is to evaluate programs, including research programs, not only on the soundness of the science, but also on how effectively its results are used.

Byerly was also a co-organizer of a science policy meeting at Columbia University in March: "Living with the Genie: Governing the Scientific and Technological Transformation of Society in the 21st Century." A very diverse group of 300 participated. The organizers wanted participation by a significant number of students and young professionals, and Byerly arranged for six from the University of Colorado to participate.

Byerly is writing a book on science policy, based on his career. This is advanced in between other activities, and is a thread through all of them.

Western Water Assessment

http://sciencepolicy.colorado.edu/wwa/index.html

Participants:

Susan Avery, Randall Dole, Martyn Clark, Martin Hoerling, Charles Howe, Douglas Kenney, William Lewis, Donald Mock, Roger Pielke Jr., James Saunders, Paul Sperry, Andy Barrett, Gary Bates, Greg Cronin, Jon Eischeid, Chris Goemans, Shaleen Jain, Bobbie Klein, Mark Lohaus, Ami Nacu-Schmidt, Claudia Nierenberg, John Pitlick, Roger Pulwarty, Andrea Ray, Lee Rozaklis, Robert S. Webb, John Wiener, Klaus Wolter, Connie Woodhouse

The overall vision for the Western Water Assessment (WWA) project is to work within an evolving social context and increase the relevance and value of scientific information in order to improve decision-making strategies. In this approach, the research focuses on the decision-making processes of the individuals, groups, and organizations in the Interior West that have responsibility for managing water resources, as well as those who use the water, and those responsible for its treatment and the protection of the aquatic environment. Collectively, this diverse set of individuals, groups and organizations represent the WWA "user community." By understanding the decision making processes, the stresses, and the constraints of this community, researchers can develop hydro-climate products that meet user needs, allowing the user community to make more informed decisions.

The objectives of the WWA project are three-fold. First, we seek to understand the sensitivity of the user community to multiple stresses, the feasibility and environmental implications of various coping strategies, and the residual vulnerability of different groups and organizations when coping strategies fail. This is undertaken primarily through interviews and an integrative modeling study that accounts for the multiple factors that influence the decisions of the user community. These factors involve not only stresses imposed by climate variability but also stresses related to social trends (demographics, energy use, land use), influences of institutional structures such as policies and laws, public values, and politics, and constraints imposed by the need to protect the aquatic environment. This research will expose groups within the WWA user community who are most sensitive to regional stresses.

The second objective of our WWA research is to develop issue-specific partnerships with the subset of climate-sensitive groups that we have identified in our study. We will examine the barriers to the use, and also possible misuses of hydro-climate information and products, and will determine if cases exist where hydro-climate information is needed, but not provided. The core activity will be to engage in an iterative process of identifying needed hydro-climate products, and then developing prototype products tailored to user needs.

The final objective of the WWA project is to share our findings on regional information needs with the federal and state agencies responsible for the operational development and delivery of hydro-climate information and products. We will work in partnership with these agencies to improve the quality, relevance, use, and, ultimately, the value of hydro-climate information and products in the Interior West. A key component of our research is to examine the process of technology transfer, and identify ways of designing our research to accelerate the transition from experimental to operational products.

Hydro-Climate Research and Decision Making

Participants:

CIRES: Martyn Clark and Andrew Barrett

United States Geological Survey: Lauren Hay, Greg McCabe, Roland Viger, Steve Markstrom, and George Leavesley.

Civil, Environmental and Architectural Engineering—CADSWES: Subhrendu Gangopadhyay, Balaji Rajagopalan, Yeonsang Hwang, Satish Regonda, Katrina Grantz, and Edie Zagona

CIRES-NOAA Climate Diagnostics Center: Shaleen Jain, Andrea Ray, and Jeff Whittaker

Desert Research Institute: Doug Boyle

NOAA Forecast Systems Laboratory: Georg Grell

Iowa State University: William Gutowski, Ray Arritt, and Eugene Takle

Kings College, London: Robert Wilby

Colorado Basin River Forecast Center, Salt Lake City: David Brandon and Steve Shumate

NWS Office of Hydrologic Development: John Schaake and Quigyun Duan

Several grants at the Center for Science and Technology Policy Research revolve around the central theme of advancing hydro-climate research to meet the decision-making needs of water managers in different parts of the country (see text box). Work elements include a) comparison and development of methods for statistical downscaling of global-scale forecast model output to provide forecasts of precipitation and temperature at local scales in individual river basins, b) assessment of the use of multi-model super-ensemble techniques in hydrology to provide probabilistic forecasts of streamflow, and c) assessment of the issues involved in fully integrating hydrologic forecasting capabilities within atmospheric modeling systems. We are currently working with the Colorado Basin River Forecast Center to compare our experimental streamflow forecasting procedures with the current operational procedures during the 2003 snow melt season, and are also working with the NWS Office of Hydrologic Development to infuse our experimental forecasting techniques in the NWS Advanced Hydrologic Prediction System.

Proposals:

NOAA	The CIRES-NOAA Western Water Assessment	1 May 2002 to 31 Jan. 2003
NOAA	One-Way and Two-Way Coupling of Atmospheric and Hydrologic Models	1 September 2001 to 31 August 2004
NOAA	Development of Operational Hydrologic Forecasting Capabilities	1 September 2002 to 31 August 2005
CIRES	Use of Multi-Model Super-Ensemble Techniques in Hydrology	1 October 2001 to 30 September 2002
CIRES	An Integrative Framework for Water Quantity and Quality Decision Making in the Face of Climate Variability	1 October 2002 to 30 September 2003
NOAA	The CIRES-NOAA Western Water Assessment	1 February 2003 to 31 January 2008
CWCB	Experimental Medium-Range Forecasts for Colorado River Forecasting	1 September 2002 to 31 August 2003
NOAA	Understanding the Spatio-Temporal variability of the North American Monsoon : Implications to Water Resources Management in the south Western U.S.	1 January 2003 to 1 January 2006

Global Climate Change and Society

http://sciencepolicy.colorado.edu/gccs/

The Global Climate Change and Society Program, a National Science Foundation-funded REU (Research Experiences for Undergraduates), will run for the third time in the summer of 2003. GCCS is a uniquely interdisciplinary program, using experience in and nuanced reflection upon ongoing scientific research to create a learning and research community among students in the physical sciences, the social sciences, and humanities. Directed by a philosopher, atmospheric scientist, and a policy scientist, students explore the nature of scientific knowledge--its epistemological character, and its social and philosophic implications--and the contribution that social scientific and humanistic perspectives can make in public policy debates. Using global climate change as a case study, students gather and evaluate scientific data and investigate the social, political, economic, and philosophical issues surrounding the interpretation and use of these data for the question of global climate change. The program explores questions such as:

- How is climate modeled? What are the predictive abilities of these models, and what are their assumptions, boundary conditions, and initial conditions? Which limits of global climate models are inherently fixable (with more data and more efficient algorithms), and which are fundamentally unaddressable by the scientific method?
- What is the nature of scientific knowledge? Does scientific knowledge offer a single, objective methodology that provides an unequivocal knowledge base for the fashioning of public policy? Or are we instead asking science and technology to address questions or problems that are also fundamentally political and/or philosophical in nature? How certain must the science be before the scientist comes before the public?
- What contribution can the humanities make to our public life? Is it possible that our environmental problems require that we learn how to blend the insights of the humanities with those of the social and physical sciences?

Students receive free housing and a $2000 stipend for the 8-week program. For the 2002 program, 120 applications were received for 12 spots, and an additional student attended from Canada.

Reanalysis of Flood Damage

http://www.flooddamagedata.org

Flood damage has increased in the United States, despite local efforts and federal encouragement to mitigate flood hazards and regulate development in flood-prone areas. To help researchers and policy makers assess national progress in reducing vulnerability to flood hazards, reasonably accurate assessments of flood damage are needed. Yet, accurate accounting for losses has historically received little attention, except in the case of insured property.

The National Weather Service (NWS) is the only organization that has maintained a reasonably consistent long-term record of flood damage throughout the U.S. The NWS damage estimates do not represent an accurate accounting of actual costs, nor do they include all of the losses that might be attributable to flooding. Rather, they are rough estimates of direct physical damage to property, crops, and public infrastructure.

The flood damage estimates presented in this project are compiled from NWS records and publications, supplemented by reports of other federal and state agencies. The accompanying report includes an evaluation of the accuracy of the estimates and recommendations for users of the data. Users should be aware that estimates for individual flood events are often quite inaccurate. However, when estimates from many events are added together the errors become proportionately smaller. When properly used, the reanalyzed NWS damage estimates can be a valuable tool to aid researchers and decision makers in understanding the changing character of damaging floods in the U.S.

Introduction

Science and technology policy research depends upon the integration of knowledge around problems and decision processes. It also depends upon close interaction with the intended users of the results of the research. Disciplinary knowledge, while often necessary for improved decision making, is rarely sufficient. One reason is that consideration of problems and decisions requires knowledge from a range of disciplines. Another is that the production of useful knowledge depends upon having some sense of what, from a particular decision maker's perspective, would constitute usefulness. At the Center for Science and Technology Policy Research we are committed to interdisciplinary research that is held to the highest scientific standards, but also focused on problems and decision processes. We are also committed to connecting that research with the needs of decision makers. In pursuing such research objectives it becomes immediately apparent that traditional science and technology education generally does not offer courses of study or degree programs that focus on problems, decisions, and the needs of decision makers. We are committed to contributing to the development of future generations of scholars and practitioners who are skilled in science and technology policy research. In the coming years we will develop a wide range of efforts in support of this goal. Our activities in 2001-2002 illustrate some degree of this range. We are focused on developing educational modules, courses, degree programs, summer programs and opportunities for visiting lecturers, discussion groups, WWW-based educational resources, mentoring and networking. As the Center develops, education will play a central role in all that we do.

Staff Highlight
Martyn Clark

Martyn Clark is leading a new collaborative effort between NOAA, the University of Colorado, the United States Geological Survey, and the National Weather Service's Office of Hydrologic Development to facilitate the use of Medium-Range Numerical Weather Prediction model output in operational hydrological forecasting applications. The approach involves a) statistical post-processing of ensemble output from global-scale Numerical Weather Prediction models to provide forecasts of precipitation and temperature at local scales in individual river basins, and b) use of these local-scale forecasts of precipitation and temperature in a suite of hydrologic models to provide probabilistic forecasts of streamflow. Results show that there is considerable value in downscaled Medium-Range forecast model output in snowmelt-dominated river basins, where daily variations in runoff are influenced more by temperature than precipitation. Improvements in local-scale forecasts of precipitation variability are necessary to provide valuable forecasts of streamflow in rainfall-dominated river basins. Clark and his colleagues are currently working with the NWS Office of Hydrologic Development to infuse these new procedures in the NWS Advanced Hydrologic Prediction System.

Student Research Assistants

Ashley Copley: Web Research

Bethany Gravell: Western Water Assessment Drought Project

Shawn Helm: Economic Forecasting

Daniel Leistra: GCCS, Carbon Sequestration Methods

Elizabeth Lowham: IGERT—Interdisciplinary Research in Science Assessments

Adam Morrison: Western Water Assessment Drought Project

Laura Musser: Vulnerability and Extreme Events

Jeremy VanCleve: GCCS, Prediction and Yucca Mountain

SPGrads

The Center hosts a group of graduate students and early career scientists interested in science and technology policy issues known as "SPGrads." SPGrads met approximately once a month during the 2002 spring semester to hear talks by experts in the science and technology policy field, and to discuss issues of concern to the participants. Over the past several months, SPGrads has had an impressive line-up of talks:

- December 14--Rad Byerly, Center Visiting Scholar and former Chief of Staff of the House Committee on Science and Technology, described the federal budget process for scientists;
- January 23--Hunter Lovins of the Rocky Mountain Institute discussed the concept of natural capitalism;
- March 8--Doug Kenney of the University of Colorado's Natural Resources Law Center presented a talk entitled "Water Resources Decision-Making in Colorado in the Face of Growth and Climate Change;" and
- April 26--Professor William Lewis of the University of Colorado (and also the chair of the National Academy of Sciences Committee on Endangered and Threatened Fishes in the Klamath River Basin) gave a talk on "Policy, Politics, Law, and Science: Elements in the Fate of Endangered Fishes of the Klamath River Basin."

In addition, several members of SPGrads attended the "Living with the Genie" conference in New York. They participated in a roundtable discussion of the conference on April 5, wrote critiques of the conference for its sponsors, and prepared an article about the conference for the Center's newsletter, Ogmius.

The Center also sponsors a listserv and website for SPGrads which includes an extensive jobs page. See http://sciencepolicy.colorado.edu/sp_grads/index.html.

Scholarships

The Center provided a $500 scholarship to Maria Tsukernik, a first year Master's student in the Department of Geography and at CIRES who is working with Thomas Chase of CIRES on a climate modeling project in the Arctic, to attend the AGU Spring Meeting in Washington, D.C. Attending the meeting provided Maria with an opportunity to make important connections with atmospheric scientists from all over U.S. This was important to Maria because her work requires collaboration with people interested in similar problems.

Environmental Studies

Meeting environmental challenges of the 21st century requires research, education, and training that spans traditional disciplinary boundaries and emphasizes the interconnections of science and decision making. Drawing on the resources of the entire University system, the University of Colorado has designed a truly interdisciplinary Graduate Program in Environmental Studies that awards two degrees: Master of Science and Doctor of Philosophy. The CIRES Policy Center has established a close relationship with the new degree program. Center Director Roger Pielke serves as the Director of the Environmental Studies Graduate Program, and CIRES and the Policy Center together have committed to support approximately 5 Environmental Studies Graduate students beginning in the fall of 2002. Many students emphasize policy, water, or biogeosciences in their studies, though particular programs of study are limited only by course offerings and faculty expertise. As the Environmental Studies Graduate Program further develops, we expect that its connections with the CIRES Policy Center will mature as well.

Talks and Presentations by Center Staff

- Byerly, R. 2001. The Federal Budget Process Talk to the Center's SPGrads science policy seminar, Center for Science and Technology Policy Research, University of Colorado, Boulder, CO, December 14.
- Byerly, R. 2002. Guest lecture on science policy to ENVS 5000, Center for Science and Technology Policy Research, University of Colorado, Boulder, CO, Spring.
- Byerly, R. 2002. Participated in a mock hearing on global change for the Carbon, Climate and Society IGERT Seminar, University of Colorado.
- Clark, M. 2002. Improved methods for Forecasting Streamflow, NWS Office of Hydrologic Development, Washington DC, February 12.
- Clark, M. 2002. Impacts of Climate Variability on Western USA Water Resources, Poster presentation at Western Governors Association Meeting, Salt Lake City, UT, April 12.
- Clark, M. 2002. Hydro-climate Research as part of the CIRES-NOAA Western Water Assessment, GAPP PIs Meeting, New Orleans, LA, May 16.
- Clark, M. 2002. The CIRES-NOAA Western Water Assessment, Spring American Geophysical Union Meeting, Washington, DC, May 20.
- Pielke, Jr., R. A. 2001. Forecasts and responsibilities in the 1997 Red River Flood, RFC/HPC Hydrometeorology, UCAR/COMET, Boulder, CO, December 3.
- Pielke, Jr., R. A. 2001. How should we use the future to make decisions today? Western Futures: Boom or Bust, Why and How? Center of the American West, Boulder, CO, November 30.
- Pielke, Jr., R. A. 2001. Climate Impact Assessment: Vulnerability as a Focal Point, Climate Change and Grizzly Bear Conservation: Projecting Impacts and Designing Adaptive Strategies, Craighead Environmental Research Institute and Montana State University, Bozeman, MT, November 7.
- Pielke, Jr., R. A. 2001. Technology Assessment of Observing System Decision Alternatives, TRMM U.S. Science Team Meeting, Fort Collins, Colorado, October 29.
- Pielke, Jr., R. A. 2001. Funding Social Science Research From Outside the Social Sciences, Graduate School Workshop on Funding Support for Social Science Research, University of Colorado, October 23.
- Pielke, Jr., R. A. 2001. Decision process pathologies related to confusing consolidative and exploratory modeling, Workshop on Climate Change Feedbacks, Climate Research Committee, National Research Council, Boulder, CO, August 13.
- Pielke, Jr., R. A. 2001. Forecasts and Responsibilities in the Red River Floods of 1997, Summer Study Workshop, Board on Atmospheric Sciences and Climate, National Research Council, August 8.
- Pielke, Jr., R. A. 2001. Policy Responses to the 1997-1998 ENSO: Implications for Forecast Value and the Future of Climate Services, Summer Study Workshop, Board on Atmospheric Sciences and Climate, National Research Council, August 8.
- Pielke, Jr., R. A. 2001. A reanalysis of the national flood loss record, University of Colorado Natural Hazards Workshop, July 18.
- Pielke, Jr., R. A. 2001. Breaking the global warming gridlock, International Association of Meteorology and Atmospheric Sciences, Innsbruk, Austria, July 12.
- Pielke, Jr., R.A. 2001. Evaluation of Weather Catastrophe Models, ICAT Managers, Boulder, CO, July 31.
- Pielke, Jr., R.A. 2001. Societal Impacts of Extreme Weather: What are the facts?, Denver-Boulder Chapter of the American Meteorological Society, Boulder, CO, September 19.
- Pielke, Jr., R.A. 2001. Breaking the Global Warming Gridlock, Institute for Behavioral Science, University of

Colorado, Boulder, CO, September 10.

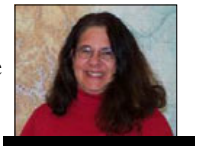
- Pielke, Jr., R. A. 2002. Science, Politics and Policy, SpoletoScienza, Spoleto, Italy, June 29.
- Pielke, Jr., R. A. 2002. A Third Generation Perspective on the Policy Sciences, Policy Sciences Summer Workshop, Boulder, CO, June 29.
- Pielke, Jr., R.A. 2002. Science, Scientists, Politics, Policy, Summer Colloquium Atmospheric Policy Program, American Meteorological Society, Washington, DC, June 6.
- Pielke, Jr., R.A. 2002. The Significance of Science, American Geophysical Union, Washington, DC, May 23.
- Pielke, Jr., R. A. 2002. Three Headlines I'd Sure Like to See, Scripps Institute on the Environment, Center for Environmental Journalism, University of Colorado, Boulder, CO, May 15.
- Pielke, Jr. R. A. 2002. Technology Assessment of Observing System Decision Alternatives, NASA Orbital Debris Colloquium, Goddard, MD, March 20.
- Pielke, Jr. R. A. 2002. Lessons learned in using and valuing forecasts, NASA Economic Value Workshop, George Washington University, Washington, DC, March 19.
- Pielke, Jr., R. A. 2002. A Few Comments on "End-User Forecast Products," a white paper prepared for the U.S. Weather Research Program Warm Season Precipitation Workshop, National Center for Atmospheric Research, Boulder, CO, March 5-7.
- Pielke, Jr., R.A. 2002. Environmental Prediction and Politics, Political Science Department, Colorado State University, March 22.
- Pielke, Jr., R.A. 2002. Space Policy Alternatives: Looking Back and Looking Ahead, K.D. Wood Colloquium, Department of Aerospace Engineering, University of Colorado, February 22.

Staff Highlight
Robert Frodeman

Bob Frodeman is the principal director of "New Directions in the Earth Sciences and the Humanities: Experiments in Interdisciplinarity." The goal of New Directions is to mobilize our intellectual and institutional resources for better integrating scientific information with societal needs, especially in regard to environmental questions.

Beginning with $15,000 from the Hennebach endowment at the Colorado School of Mines, New Directions has now secured nearly $200,000 in additional financial support, plus another $100,000 in in-kind contributions. Extra support has come from a variety of public agencies such as the National Science Foundation, the Environmental Protection Agency, the U.S. Geological Survey, the National Aeronautics and Space Administration, and the National Endowment for the Humanities. A number of universities -- including Columbia, Penn State University, and the University of Colorado -- have also joined the effort. Scientists and humanists work together with public agencies, private firms, and communities to come up with sustainable environmental solutions. This project will relocate to the CIRES Policy Center in Fall 2002.

Talks Sponsored by the Center



Dr. Eve Gruntfest

- "Research and Simulation for the Burial of Radioactive Waste in Salt Formations" Dr. Muratu Akhmetov, Director, and Dr. Azamat Amandossov, Senior Scientist, Institute of Radiation Safety and Ecology, Republic of Kazakhstan (cosponsored by the Graduate School) June 4, 2002. The Center also sponsored a brown bag lunch for Center members and Drs. Akhmetov and Amandossov.
- "Good or Bad: What Boulder Creek Floodplain Residents are Thinking about Flood Risk" Dr. Eve Gruntfest, Professor of Geography and Environmental Studies, University of Colorado, Colorado Springs and Visiting Scholar, National Center for Atmospheric Research (cosponsored by IBS' Natural Hazards Research & Applications Information Center) May 2, 2002

Roger Kennedy

- "The Abrasion of Human and Natural Systems: Fire, Flood, Risk, and Responsibility" Roger Kennedy, former director, National Park Service (cosponsored by CIRES) September 4, 2001

Center Discussion Groups

The Center sponsors two Internet-based discussion groups, Weatherpolicy, and SPGrads.

Weatherpolicy:

The Weatherpolicy email list is for anyone interested in weather policy. Weather policy has two inter-related components. One is "policies for weather research and decision making." This includes government policies about weather research, forecast operations, and responses focused primarily on the National Weather Service, but more broadly constituted would include the Department of Agriculture, Federal Emergency Management Agency, Small Business Administration, and other agencies that deal with weather and its impacts. It also covers the private sector, notably including providers of weather information and the insurance industry. Of course, an important aspect of weather policy is the relationship between the public and private sectors.

A second component of weather policy is "weather research for decision making" and refers to the connections between research and the actions taken in preparation for and response to weather. This aspect of weather policy is variously called "forecast use and value" and "connections of research and operations." There is a small but significant body of literature in this area, but for the most part it has not been discussed in terms of policy as it has been in the climate and ocean areas.

The Weatherpolicy listserv had 112 members as of July 2002.

SPGrads:

The SPGrads email list is for graduate students and early-career scientists interested in issues of science and technology policy. Specifically, the list is for discussion of a wide range of subjects related to science policy, technology policy, and technology assessment.

Science policy is described by the phrases "science for policy" and "policy for science." The former refers to how scientific information is linked to decision making and the latter to governance of the scientific enterprise itself. Technology policy refers to the interrelationship of government, academia, and the private sector, and their shared goal of enhancing economic vitality through the transfer of knowledge to useful products and processes. Technology policy research seeks to understand these relationships and to develop, evaluate, and critique them. Technology assessment seeks to integrate knowledge of technological systems with their broader social and policy context as a contribution to the governance of science and technology. Decisions about how to allocate finite (and frequently scarce) resources can be made more effectively when decision makers consider integrated understandings of technology in society.

The SPGrads listserv had 41 members as of July 2002.

Newsletters


Ogmius

Introduction to the Ogmius Exchange

Ogmius Exchange

The Data Quality Act: A New Tool for Ensuring Clarity at the Interface of Science and Policymaking

The Center publishes two newsletters, Ogmius and Weatherzine. Both are available online in html and pdf format, as well as by online subscription.

The Center launched the first issue of Ogmius in January 2002. The highlight of each issue of Ogmius is an exchange among leading voices in science and technology policy. For example, the May 2002 exchange concerned the recently enacted Data Quality Act. Arguing in favor of the Act was Jim Tozzi, the first deputy director of the Office of Information and Regulatory Affairs at the Office of Management and Budget from 1981-1983 and currently of the Center for Regulatory Effectiveness, which was instrumental in passage of the Data Quality Act. Pointing out some of the pitfalls of the Act was Chuck Herrick, who served as associate director of the White House Council on Environmental Quality and assistant director of the National Acid

Precipitation Assessment Program, and is currently a Vice President at Stratus Consulting. Ogmius also includes news about Center projects and publications, web and media resources, job and educational opportunities in science and technology policy, and other items of interest to the community.

WeatherZine is a bimonthly newsletter on the societal aspects of weather that has been in publication since December 1996. Each issue contains an editorial by Roger Pielke Jr., a guest editorial, a student editorial, a research highlight, an education highlight, weather-related news, job listings, and a brief summary of developments at the Societal Aspects of Weather Web site. WeatherZine has approximately 750 subscribers. Primary support for the WeatherZine comes from the U.S. Weather Research Program. WeatherZine was used as a model by EPRI for developing its Climate Currents newsletter.

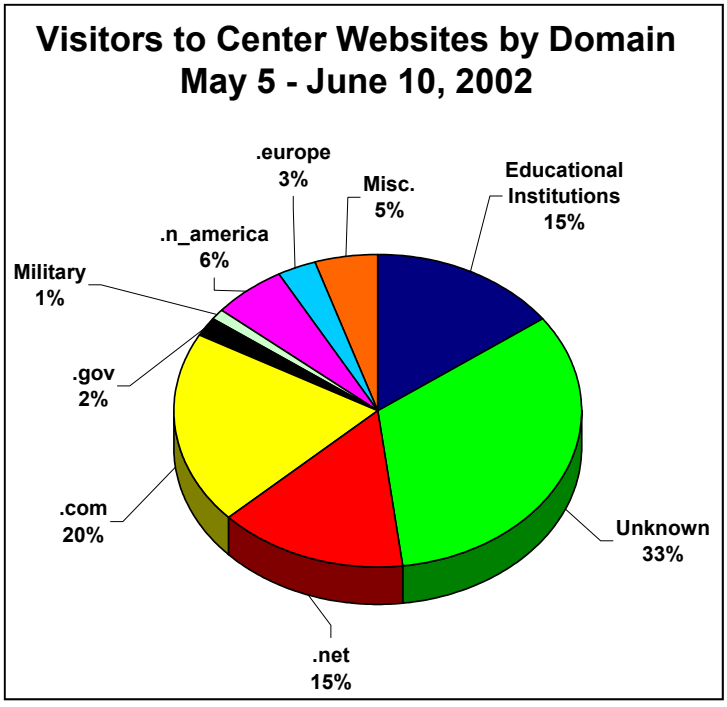
The Center's Web Presence

As an integral part of its extensive outreach efforts on the Internet, the Center has its own web server and employs its own full-time webmaster, Mark Lohaus. Mark is responsible for the design and content of the Center's websites (see text box on page 14), as well as keeping the server functioning properly. From the Center's home page visitors can link to information about the Center's research areas, mission statement, list of projects, staff home pages, list of visitors and collaborators, and contact information, read the Center's two newsletters, and find web resources and information about educational opportunities. The home page includes a "What's New" section highlighting recent or upcoming Center news such as publication of newsletters, speakers, and job openings.

Each project at the Center has its own customized web page. The Center completely revised and updated the site for the Western Water Assessment, including the addition of a special "In Focus at WWA" section highlighting topical issues such as the drought of 2002.

The Center also fully revised and updated the website for Global Climate Change and Society.

The Center's webmaster compiles and analyzes data on website usage. In May 2002, for example, the Center's websites received 188 "unique visits" per day on average, peaking at 382 in one day. To these visitors, the Center's sciencepolicy server provides an average of about 1,600 web pages totaling nearly 60 megabytes of data per day.



SPGrads	SPGrads is for graduate students and early-career scientists interested in issues of science and technology policy. The site includes the SPGrads listserv, an email forum for discussion of a wide range of subjects related to science policy, technology policy and technology assessment. It also includes information on past and upcoming events.	http://sciencepolicy.colorado.edu/sp_grads/index.html
Science & Technology Job Opportunities	This site links to pages with science and technology policy jobs, internships, fellowships, etc.	http://sciencepolicy.colorado.edu/sp_grads/
Societal Aspects of Weather (SOCASP)	The Societal Aspects of Weather web site is a community resource for information on floods, tornadoes, summer and winter weather, injury and damage statistics, weather policy, weather impacts resources, general weather resources, hurricanes, lightning, El Niño/La Niña, emergency management, insurance, and the WeatherZine newsletter.	http://sciencepolicy.colorado.edu/socasp/toc_img.html
Global Climate Change and Society	Global Climate Change and Society (GCCS) is a summer research program for undergraduates sponsored by the National Science Foundation. Students explore the nature of scientific knowledge--its epistemological character, and its social and philosophic implications--and the contribution that social scientific and humanistic perspectives play in public policy debates.	http://sciencepolicy.colorado.edu/gccs/
Western Water Assessment	WWA research focuses on the decision making processes of those who manage water resources and the use of water, and are responsible for its treatment and the protection of the aquatic environment.	http://sciencepolicy.colorado.edu/wwa/
The Atmospheric Sciences Policy Education & Network (ASPEN)	The Atmospheric Sciences Policy Education and Network (ASPEN) Program is focused on weather policy research, education, and outreach. It is supported by the U.S. Weather Research Program. The ASPEN Program includes research, education, and outreach.	http://sciencepolicy.colorado.edu/aspen/index.html
Flood Damage in the U.S.	A reanalysis of National Weather Service estimates that are compiled from NWS records and publications, supplemented by reports of other federal and state agencies.	http://www.flooddamagedata.org/
Science, Technology, & Security Symposium	Organized by the CIRES Center for Science and Technology Policy Research, the Fall 2002 Symposium seeks to foster new connections and dialogue among decision makers and scientists from institutions along the Colorado Front Range. The Symposium will bring together national and local experts to discuss topics such as computer security, bioterrorism, water security, support for homeland defense, and emergency management.	http://sciencepolicy.colorado.edu/events/security_symposium_2002/
Extreme Weather Sourcebook 2001	The Extreme Weather Sourcebook 2001 Edition was created at the National Center for Atmospheric Research (NCAR) in the Environmental and Societal Impacts Group as a source of economic and other societal impacts related to hurricanes, floods, tornadoes, lightning, and other U.S. weather phenomena.	http://sciencepolicy.colorado.edu/sourcebook/index.html

The most popular page on the site is the Extreme Weather Sourcebook, which summarizes and displays economic and other societal impacts related to hurricanes, floods, tornadoes, lightning, and other U.S. weather phenomena. Many people are finding the sciencepolicy websites through search engines like Google and Yahoo, mainly by searching for weather related topics.

Congressional Testimony

In 2002 several Center Staff members were invited to share their views on science and technology policy matters with members of Congress in hearings held in the House and the Senate:

On March 13, 2002, Center Director Roger Pielke Jr. testified before the United States Senate Committee on Environment and Public Works. The subject of his testimony was the economic and environmental risks associated with increasing greenhouse gas emissions. He argued that weather and climate have growing impacts on economies and people around the world, that the primary cause for growth in impacts is the increasing vulnerability of human and environmental systems to climate variability and change, not changes in climate per se, and that to address increasing vulnerability, and the growing impacts that result, requires a broader conception of "climate policy" than now dominates debate. He suggested that the nation's investments in research could be more efficiently focused on producing usable information for decision makers seeking to reduce vulnerabilities to climate. Specifically, the present research agenda is improperly focused on prediction of the distant climate future. A copy of Roger's remarks can be found at http://sciencepolicy.colorado.edu/homepages/roger_pielke/rp_senate/13_2002/index.html.

On April 17, 2002, Visiting Scholar Rad Byerly testified before the United States House Science Committee. The subject of Rad's testimony was "New Directions for Climate Research and Technology Initiatives". He told the committee members that the top priority for climate change research should be "connecting with users while planning research. Research would be preceded by a planning phase in which users and scientists would identify and define specific problems to be attacked, as well as specific questions and information needs, and would look ahead to the application of the results." A copy of Rad's remarks can be found at http://sciencepolicy.colorado.edu/homepages/rbyerly/house_testimony_apr_2002/index.html.

Staff Highlight
Bobbie Klein

Bobbie Klein has been instrumental in the Center's development over the past year. As the Center's Managing Director, Bobbie played a key role in hiring its outstanding staff, developing its outreach efforts through the Internet, newsletters, and speakers, and obtaining approval of its program plan, budget, and by-laws. Two papers by Klein and Roger Pielke, Jr., addressing the legal liability of public and private sector weather forecasters for incorrect weather forecasts, will appear in forthcoming issues of the Bulletin of the American Meteorological Society. Klein's chapter, "Wolf recovery in the Northern Rockies," in Brunner, ed., 2002: Finding common ground: Governance and natural resources in the American West, Yale University Press, was awarded the 2002 Harold D. Lasswell Prize for exemplary work in the policy sciences.

MEDIA COVERAGE

Center staff have received substantial media attention since the Center's inception:

- Roger Pielke was quoted by the New York Times on June 23, 2002 in an article entitled "Era of the Big Fire Is Kindled at West's Doors" by Timothy Egan. In discussing the risks associated with building homes in fire-prone forested areas, Pielke stated that there needs to be an acknowledgment of costs. "The question is when do you want to pay… You can pay through government disaster assistance and higher insurance premiums after the fact, or pay in advance through changing land-use and forest-management policies." But the latter option is not something an elected official will find very palatable, Professor Pielke said. "Would you rather be looked at as a hero, bringing in aid after a disaster," he asked, "or a bad guy who doesn't allow you to build in the way you want and place you want?"
- Martyn Clark appeared on KMGH channel 7 news on April 30, 2002 to discuss the possibility that the emerging El Nino event may reduce the severity of the current drought. He was also interviewed by KOA Radio on April 30, 2002 and by KNUS Radio on May 7, 2002. Clark was quoted by the Longmont, Colorado Daily Times-Call in its May 1, 2002 article "El Nino: Miracle cure?" by DeeDee Correll, and by the Colorado Springs Gazette in its May 12, 2002 article "The land is thirsting for a solution to the worst drought in years, but experts warn nature has a mind of its own," by Barry Bortnick.
- The April 1, 2002, edition of the San Francisco Chronicle discussed Roger Pielke's recent article in the journal Nature about the controversy sparked by Bjorn Lomborg's book, The Skeptical Environmentalist. See "Politicizing science degrades research, one scholar warns. Special interests replace objectivity on critical issues." Pielke's Nature article was also discussed in the Italian journal Galileo. See "La sottile linea fra scienza e politica."
- The Boulder Daily Camera reported on March 16, 2002, that Roger Pielke recently testified before a U.S. Senate committee about economic and environmental risks associated with the world's increasing emissions of carbon dioxide and other "greenhouse gases."
- The January 15, 2002, issue of EOS included an article about Global Climate Change and Society (GCCS), "Undergraduates Study Climate Change Science, Philosophy, and Public Policy" (p. 23).
- Roger Pielke was interviewed by the Daily Camera about a proposal to pump carbon dioxide into underground coal beds in "Scientists Propose Pumping Greenhouse Gas Underground", by Katy Human (Nov. 27, 2001).
- Politics, more than climate, influences the federal costs of flood disasters, according to a November 2001 study by NCAR associate scientist Mary Downton and University of Colorado professor Roger Pielke Jr. titled Discretion Without Accountability: Climate, Flood Damage and Presidential Politics, Natural Hazards Review, 4:157-166. See What Drives the Costs of Flood Disasters? (Nov. 2, 2001 press release).
- Roger Pielke was quoted in the New York Times about the search for evidence of hurricanes that struck the U.S. from 1851 and earlier: in "Experts Unearth our Stormy Past", by Andrew C. Revkin (July 24, 2001).

Publications
2001-2002

Frei, A., R.L. Armstrong, M.P. Clark, and M.C. Serreze, 2002: Catskill Mountain Water Resources: Vulnerability, Hydroclimatology, and Climate-Change Sensitivity. Annals of the Association of American geographers, June 2002, vol 92, no. 2, pp 189-202.

Frodeman, R. and C. Mitcham, The Search for Balance in the Public Support for Science, Technology in Society, vol. 23, no. 4, forthcoming ("Science and Technology Policy" volume).

Frodeman, R. and T. Raab, What is it Like to be a Geologist? Philosophy and Geography, forthcoming Spring, 2002.

Lo, F. and M.P. Clark, 2002: Relationships between spring snow mass and summer precipitation in the southwestern USA associated with the North American monsoon system. Journal of Climate, vol 15, pp 1378-1385.

Pielke, Jr., R. A. 2002. A Few Comments on End-User Forecast Products as input to the USWRP Warm Season Workshop of 5-7 March 2002. Boulder, CO.

Pielke, Jr., R. A. 2002. Policy, politics and perspective. Nature 416:368.

Pielke, Jr., R. A. 2002. Response of Dr. Roger A. Pielke, Jr. to Questions Posed by the Committee on Environment and Public Works of the United States Senate, Hearing on Economic and Environmental Risks Associated with Increasing Greenhouse Gas Emissions.

Pielke, Jr., R. A. 2002. Statement of Dr. Roger A. Pielke, Jr. to the Committee on Environment and Public Works of the United States Senate, Hearing on Economic and Environmental Risks Associated with Increasing Greenhouse Gas Emissions.

Pielke Jr., R.A., and C.W. Landsea, 2002. La Nina, El Nino, and US Atlantic hurricane damages. In: M.H. Glantz (ed.), La Nina and Its Impacts: Facts and Speculation. Tokyo, Japan: UN University Press, 119-123.

Pielke Jr., R.A., and C.W. Landsea, 2002. Resources for Impacts and Responses: La Nina, El Nino, and US Atlantic Hurricane Damages, updated from pp. 119-123 in M.H. Glantz (ed.), La Nina and Its Impacts: Facts and Speculation. Tokyo, Japan: UN University Press, 119-123.

Sarewitz, D. and R. A. Pielke, Jr. 2002. Vulnerability and Risk: Some Thoughts From A Political and Policy Perspective, A Discussion Paper prepared for Columbia-Wharton/Penn Roundtable on "Risk Management strategies in an Uncertain World," 4 April.

Staff Highlight
Jill Litt

Dr. Jill Litt, an assistant professor of environmental health in the Department of Preventive Medicine and Biometrics and the CU Environmental Studies Program, was an invited speaker at the 20th Annual Epidemiological Research Exchange held on November 30, 2001 at the University of Colorado Health Sciences Center. The plenary session was entitled "Public Health Preparedness: Then and Now" which featured a panel of experts on bioterrorism and public health preparedness. Dr. Litt spoke about environmental health surveillance in terms of the nation's capacity to respond to chemical threats and the challenges of balancing public health needs, public access to environmental health information and national security.

AWARDS

HAROLD D. LASSWELL PRIZE

Bobbie Klein was awarded the 2002 Harold D. Lasswell Prize for exemplary work in the policy sciences for her chapter, "Wolf recovery in the Northern Rockies," in Finding Common Ground: Governance and natural resources in the American West, Brunner (ed), York University Press.

OUTSTANDING GRADUATE ADVISOR

Roger Pielke, Jr. was awarded the outstanding Graduate Advisor Award for 2000-2001 by the graduate students in the University of Colorado Department of Political Science.

IAMAS LECTURER

Roger Pielke, Jr. was one of four IAMAS Plenary Lecturers in 2001 and presented "Breaking the global warming gridlock," at the International Association of Meteorological and Atmospheric Sciences in Innsbruk, Austria.

WORLD METEOROLOGICAL ORGANIZATION LECTURER

Roger Pielke, Jr. was an Expert Lecturer in 2002 and presented "Weather Forecasts, Impacts, and Policy", at the World Meteorological Organization's Commission on Atmospheric Sciences XIII in Oslo, Norway.

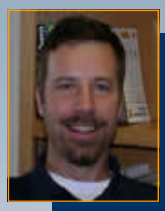
Board and Committee Memberships

Radford Byerly

National Committee Service

- A National Research Council (NRC) committee looking at how the development of nuclear waste repositories should be managed. This study will support the Yucca Mountain Project.
- The NRC Space Studies Board which conducts policy studies for the nation's space program. Recently Byerly coordinated the board's review of a survey and prioritization of future planetary missions.
- The Board of Directors of the Associated Universities for Research in Astronomy (AURA). AURA is a consortium of universities, and its essential role is to develop and operate astronomical facilities too large for most universities to undertake alone. AURA manages the science operations of the Hubble Space Telescope for NASA.
- The Committee on Science, Engineering and Public Policy of the American Association for the Advancement of Science.
- The Board of Visitors of the Columbia University Center for Science Policy and Outcomes.

Staff Highlight
Mark Lohaus



Mark Lohaus developed the Center's Web presence by designing an attractive and professional look and feel for the Center's Web sites. In addition to adding Web content, Mark also managed the Center's Web server, Sciencepolicy, by doing backups, configuring the system and installing software such as a search engine, link verification tool, site statistics software and a database management system. Mark also built a development Web server to test and develop new content. To help manage content, Mark created programs to add and modify content quickly. Supplemental to his duties as the Center's Webmaster, Mark has acted as a computing resource to the Center as a whole by helping to solve problems, managing users and giving periodic guidance when problems arise.

Roger Pielke, Jr.

Editorial Board Membership

- Member, Editorial Board, Bulletin of the American Meteorological Society
- Member, Editorial Board, Policy Sciences
- Associate Editor, Natural Hazards Review, American Society of Civil Engineers

National and International Committee Service

- Consultant, National Academy of Sciences, Board on Environment and Natural Resources, Committee on Public-Private Partnerships in Weather and Climate Services
- Member, Expert Social Science Review Panel, National Oceanic and Atmospheric Administration Science Advisory Board
- Member, Board of Directors, WeatherData, Inc.
- Chair, Review Committee of National Oceanic and Atmospheric Administration, Office of Global Programs, CLIMAS Program
- Member, National Academy of Sciences, Board on Ocean Sciences Committee on Abrupt Climate Change
- Member, Board on Atmospheric Sciences and Climate, National Academy of Sciences
- Member, Climate and Global Change Review Panel, Office of Global Programs
- National Oceanic and Atmospheric Administration, Member of Executive Committee
- Member, Science Steering Committee, World Weather Research Programme
- Chair, Committee on Societal Impacts, American Meteorological Society
- Member, Diversity Task Force, University Corporation for Atmospheric Research

Visitors and Collaborators
2001-2002

- Dr. Muratu Akhmetov, Director, Institute of Radiation Safety and Ecology, Republic of Kazakhstan
- Dr. Azamat Amandossov, Senior Scientist, Institute of Radiation Safety and Ecology, Republic of Kazakhstan
- Ray Arritt, Iowa State University
- Susan Avery, CIRES
- Andy Barrett, NSIDC / CIRES
- Roger Barry, NSIDC / CIRES
- Gary Bates, CDC
- Doug Boyle, Desert Research Institute
- Ron Brunner, University of Colorado, Political Science Department
- Mark Cane, Columbia University
- Rit Carbone, NCAR
- Dan Cayan, SCRIPPS
- Thomas Chase, CIRES
- Russell Chibe, CSU
- Jim Clark, Duke University
- Lindy Coe-Juell, University of Colorado, Political Science Department
- Richard Conant, Natural Resources Ecology Laboratory, CSU
- Christina Cromley, American Forests
- Greg Cronin, CIRES Center for Limnology
- Carol Daly, Flathead Economic Policy Center
- Cecilia Danks, University of Vermont, School of Natural Resources
- Mike Dettinger, SCRIPPS
- Henry Diaz, CIRES/CDC
- Thomas Dickinson, Institute of Behavioral Science (IBS)
- Randall Dole, CDC
- Mary Downton, NCAR
- Kelvin Droegemeier, OU
- Qingyun Duan, NWS Office of Hydrology
- Christy Edwards, University of Colorado, Public Policy Program
- Maia Enzer, Sustainable Northwest
- Tom Feiler, Rocky Mountain Institute
- Mario Fernandez, CEER-Havana Cuba
- Allan Frei, Hunter College, New York
- David Getches, CU Natural Resources Law Center
- Chris Goemans, Institute of Behavioral Science (IBS)/EB
- Gerry Gray, American Forests
- Georg Grell, Forecast Systems Laboratory
- Dr. Eve Gruntfest, Professor of Geography and Environmental Studies, University of Colorado, Colo. Springs
- Lauren Hay, USGS
- Bob Henson, UCAR
- Martin Hoerling, CDC
- Bill Hooke, AMS
- Charles Howe, Institute of Behavioral Science (IBS)
- Shaleen Jain, CIRES / CDC
- Lynn Jungwirth, The Watershed Center

- Dave Kanzer, Colorado River Water Conservation District
- Roger Kennedy, Former USGS Park Service Director
- Douglas Kenney, CU Natural Resources Law Center
- Chris Landsea, NOAA-HRD
- George Leavesley, USGS
- William Lewis, CIRES Center for Limnology
- Hunter Lovins, Rocky Mountain Institute
- Greg McCabe, USGS
- Donald Mock, CDC
- M. Granger Morgan, CMU
- Rebecca Morss, NCAR
- Claudia Nierenberg, NOAA/OAR
- Dev Niyogi, NC State University
- Anne Nolin, NSIDC / CIRES
- Doug Ouren, USGS
- Zaito Pan, Iowa State University
- Roger Pielke, Sr., Colorado State University
- John Pitlick, University of Colorado, Dept of Geography
- Rutherford V. Platt, University of Colorado, Dept. of Geography
- Steve Primm, Northern Rockies Conservation Cooperative
- Balaji Rajagopalan, University of Colorado, Dept. of Civil, Environmental and Architectural Engineering
- Andrea Ray, CDC
- Kelly Redmond, DRI/WRCC
- Dave Robinson, Rutgers University
- Lee Rozaklis, Hydrosphere, Inc.
- Jose Rubiera, Cuban Meteorological Service
- Dan Sarewitz, Columbia University
- James Saunders, CIRES Center for Limnology
- Sarah Schaefer, University of Oregon
- Mark Serreze, NSIDC / CIRES
- John Schaake, NWS Office of Hydrology
- Andrew Slater, CIRES
- Catherine Smith, CDC
- Paul Sperry, CIRES
- Toddi Steelman, North Carolina State University
- Gene Takle, Iowa State University
- Donna Tucker, University of Colorado
- Harold Tyus, CIRES Center for Limnology
- Baxter Vieux, OU
- Mark Waage, Denver Water
- Robert S. Webb, NGDC and CDC
- Peter Webster, PAOS/CIRES
- James Wescoat, University of Colorado, Dept. of Geography
- Jeff Whittaker, CDC
- John Wiener, Institute of Behavioral Science (IBS)
- Robert Wilby, Kings College, London
- Klaus Wolter, CDC
- Connie Woodhouse, INSTAAR and NGDC

Staff Highlight
Ami Nacu-Schmidt

Ami Nacu-Schmidt, the Center's Office Manager, has been influential in overseeing the daily functioning of the Center. She also shares responsibility for publication of two newsletters, Ogmius and WeatherZine. Ami's professional accomplishments include creating the Center's new brochure, as well as creating new designs for the Center's newsletters, Ogmius and WeatherZine. Ami's creativity, problem-solving, and attention to detail keep the Center running smoothly.

Faculty Affiliates and Visiting Scholars

The Center seeks to assemble an array of local and national experts in a variety of policy areas to serve as faculty affiliates and visiting scholars. Faculty affiliates and visiting scholars can provide valuable expertise for both Center researchers and graduate and undergraduate students.

Faculty Affiliates are colleagues who share an interest in science and technology policy research. It is our expectation that the Center's faculty affiliates will comprise a broad community that spans traditional disciplines and organizational units. Faculty interested in an affiliate appointment with the Center should contact us at pielke@colorado.edu.

Visiting Scholars are significant, long-term collaborators on issues of science and technology policy who may be in residence at the Center. Visiting Scholars are appointed by the Center's Director with approval by the Center's Executive Committee.

- Susan K. Avery, 2002, Faculty Affiliate
  Professor, Department of Electrical and Computer Engineering and Director, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder (areas: environmental science and policy)

Susan Avery

- Ron Brunner, 2002, Faculty Affiliate
  Professor, Department of Political Science, University of Colorado, Boulder (areas: policy)

Ron Brunner

- Rad Byerly, 2001, Visiting Scholar
  Former Chief of Staff, House Science Committee, U.S. House of Representatives (areas: science policy, government)

- Robert Frodeman, 2002, Visiting Scholar
  Hennebach Professor of the Humanities at the Colorado School of Mines, Co-Director of the New Directions Initiative, editor of Earth Matters: the Earth Sciences, Philosophy, and the Claims of Community, and author of Geo-Logic. Bob directs the Global Climate Change and Society Program

- Ann Keller, 2002, Faculty Affiliate
  Assistant Professor of Political Science and Environmental Studies, University of Colorado, Boulder (areas: environmental policy)

Ann Keller

- Roger Kennedy, 2002, Visiting Scholar
  Former director, U.S. National Park Service (areas: environmental policy, government)

Myanna Lahsen

- Myanna Lahsen, 2002, Visiting Scholar
  Researcher, Belfer Center for Science and International Affairs (BCSIA), John F. Kennedy School of Government / Harvard University (areas: climate change policy)

- Frank Laird, 2002, Faculty Affiliate
  Associate Professor of Technology and Public Policy, Graduate School of International Studies, University of Denver, Denver (areas: science and technology policy)

Frank Laird

- Jill Litt, 2002, Faculty Affiliate
  Assistant Professor, Department of Preventive Medicine and Biometrics, School of Medicine, University of Colorado Health Sciences Center, Denver (areas: public health policy)

- Jim Martin, 2001, Faculty Affiliate
  Attorney and Director, Natural Resources Law Center, University of Colorado, Boulder (areas: law, environmental policy)

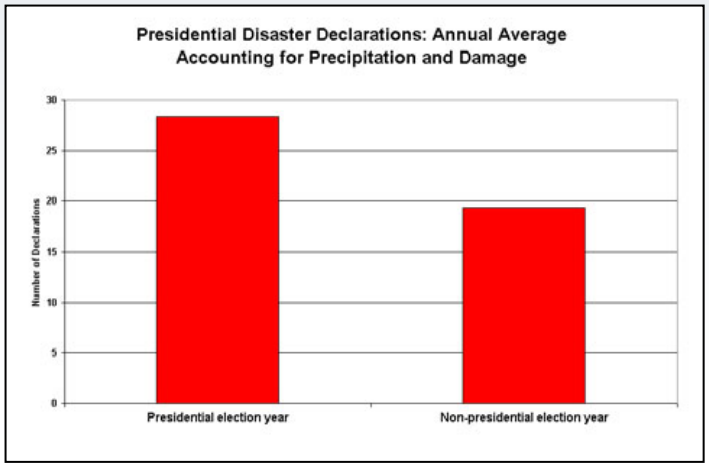
Alex Wolf

- Alex Wolf, 2001, Faculty Affiliate
  Associate Professor, Department of Computer Science, University of Colorado, Boulder (areas: computer/high tech security policy)

Staff Highlight
Roger Pielke, Jr.

In 2001, Roger Pielke, Jr. and Mary Downton (of the National Center for Atmospheric Research) published a paper in the journal Natural Hazards Review that concluded that politics, more than climate, influences the federal costs of flood disasters. States are far more likely to receive federal funds through a presidential disaster declaration in years when the president is running for reelection. Downton and Pielke identified a 46% increase in disaster declarations during presidential reelection years, independent of the amount of precipitation or flood damage and whether the president is Republican or Democrat. Ronald Reagan stands out dramatically among presidents with the fewest disaster declarations, once the damage and precipitation effects are factored out. There was more damage from flooding during the Clinton administration than during the first Bush administration, and the number of disaster declarations under Clinton was higher. After removing damage and precipitation effects, the researchers found that Clinton's declaration numbers were about the same as Bush's. Congressional and administrative guidelines for presidential declarations have not changed substantially since the authorizing legislation in 1950; their language allows presidents considerable discretion to respond in the wake of a disaster. Downton and Pielke observed that understanding the relationship of politics and climate in disaster declarations is a policy area that has not received much scrutiny to date.

Downton, M. and R. Pielke, Jr., 2001: Discretion Without Accountability: Climate, Flood Damage and Presidential Politics, Natural Hazards Review, 2(4):157-166. http://sciencepolicy.colorado.edu/homepages/roger_pielke/hp_roger/pdf/downtonpielke2001.pdf.



PROGRAM PLAN

Center for Science and Technology Policy Research
Cooperative Institute for Research in Environmental Sciences
University of Colorado at Boulder

August 2002

1. General Purpose of the Unit

a. Background

The past decade has seen a growing demand by public and private decision makers for "usable" scientific information. Such information can serve decisions that have a scientific component or decisions about the structures, organizations, and priorities of science itself. An area of inquiry that seeks to meet this growing demand for information is science and technology policy research. Such research is characterized by its focus on "problems" and "decisions" (or more accurately, "decision processes") as the units of analysis with an explicit objective of providing information that is useful and relevant in decision making. This focus on problems and decisions sets *science and technology policy research* apart from other efforts to integrate knowledge across traditional disciplines.

Because problems and decisions are not bounded by any discipline or set of disciplines, science and technology policy research is necessarily integrative across the physical, social, and biological sciences (as well as other fields, including the humanities). The specific decision or problem that is the focus of inquiry dictates the sort of knowledge that is relevant to the research.

The past decade also has seen growing interest among scientists in investigating research problems that require the input of more than just a single traditional discipline. At the same time, decision makers in both public and private settings have asked the science and technology communities to provide knowledge that is of more direct usefulness in their decision making. The notion of science and technology policy research provides a mechanism to reconcile these two closely related – but not identical – trends. By linking integrative science with the needs of decision makers, science and technology policy research can play a valuable role in helping the research community better focus its efforts on issues of importance to society and in helping decision makers more effectively incorporate scientific and technological advances into their decision processes.

Science and technology policy research depends critically upon cutting edge research in virtually all areas of inquiry – biology, ecology, engineering, atmospheric and oceanic sciences, hydrology, geography, medicine, sociology, economics, political science, law, philosophy, history, journalism, etc. It also depends on innovative approaches to multi-disciplinary research in order to integrate knowledge from these areas in a way that directly contributes useful information to decision makers. An explicit focus on science and technology policy research can contribute needed expertise and perspective in the quest for scientific and technical knowledge usable by decision makers.

Recognizing the importance of integrating scientific research with the needs of decision makers, the Cooperative Institute for Research in Environmental Sciences (CIRES) began to develop a Center for Science and Technology Policy Research in the fall of 2001. The Center is a major step in CIRES' plan to promote science in service to society based on the foundation of synergy between the National Oceanic and Atmospheric Administration (NOAA) research and University academics.

b. *Purpose*

The Center is established within CIRES at the University of Colorado-Boulder. Its mission is to conduct research, education, and outreach at the interface of science, technology, and the needs of decision makers in public and private

settings. The Center's research will be highly integrated with the ongoing activities of CIRES, the National Oceanic and Atmospheric Administration, the University, and the broader science and technology community. It seeks to become a center of excellence in the research community and a national and international leader in research, teaching, and outreach in the areas of science policy, technology policy, and technology assessment. Each of these areas is described below:

- Science policy. The traditional scholarly interest in science policy has for many years been captured by the phrases "science for policy" and "policy for science." The Center will explore how scientific information is linked to decision making and will also examine governance of the scientific enterprise with topics that range from broad federal government resource allocation issues to the practice of peer review.

- Technology policy. Technology policy refers to the interrelationship of government, academia, and the private sector, and their shared goal of enhancing economic vitality through the transfer of knowledge to useful products and processes. Technology policy research seeks to understand these relationships and to develop, evaluate, and critique them.

- Technology assessment. Technology assessment seeks to integrate knowledge of technological systems with their broader social and policy context as a contribution to the governance of science and technology. Decisions about how to allocate finite (and frequently scarce) resources can be made more effectively when decision makers consider integrated understandings of technology in society.

In partnership with the Department of Environmental Studies, as well as disciplinary departments in the social and physical sciences, law, humanities, engineering, and others, the Center will develop a pedagogical presence at both undergraduate and graduate levels. This will include development of focused seminars, topical and cross-disciplinary courses, and an internship program.

The Center will emphasize outreach to the academic community and private and public decision makers using tools such as the Internet, newsletters, and multidisciplinary workshops.

2. Congruence with Role and Mission of University, Campus, and Parent Unit

The Center falls within the integrating CIRES focus on "science in service to society." The Center will advance the mission of CIRES, which is to act as a national resource for multidisciplinary research and education in the environment sciences. The Center intends to be a national and international leader in research, teaching, and outreach in the multidisciplinary areas of science policy, technology policy, and technology assessment.

The Center's focus on science and technology policy research contributes directly to the University's mission:

> **Our mission is to advance and impart knowledge across a comprehensive range of disciplines to benefit the people of Colorado, the nation, and the world by educating undergraduate and graduate students in the accumulated knowledge of humankind, discovering new knowledge through research and creative work, and fostering critical thought, artistic creativity, professional competence, and responsible citizenship**.

More concretely, the Center's research, teaching, and outreach activities will help advance many of the goals of CU-Boulder's Strategic Plan, as well as the CU 2010 Vision for the University of Colorado:

- Strategic Plan Goal - Enhance Student Learning
  CU 2010 Goal - Culture of Excellence

The Center will enhance professional and educational opportunities in currently underrepresented multidisciplinary areas such as teaching students to understand and shape the connections of scientific research with the needs of decision makers. It will offer opportunities for students to engage in creative scholarship that crosses many disciplines to address important policy issues related to the environment, technology, medicine, and engineering, among others.

- Strategic Plan Goal - Serve Our Communities

CU 2010 Goal - University without Walls

The Center will emphasize two-way communication with the academic community as well as with private and public decision makers using a wide range of tools including the Internet, newsletters, and workshops. It will also work closely with CIRES and University public outreach and education efforts. The Center's focus on developing useful information necessitates an active program of outreach.

- Strategic Plan Goal - Ask "What's best for students?"

The Center's focus on "problems" and "decisions" will enhance the University's capabilities to offer critical thinking courses and, more specifically, to teach students how it is that scientific and technological advancements are related to real-world issues faced by society every day. The Center will contribute to the training of the next generation of practitioners and scholars at the interface of science and society.

- Strategic Plan Goal - Increase Support for Teaching, Research, and Creative Work
  CU 2010 Goal - University without Walls

The Center's work is multidisciplinary. It will continue to use innovations in technology such as the Internet to improve its research, teaching, and outreach efforts. The Center will work with many departments on campus and in the broader University system, as well as with partners at other institutions to facilitate and enhance research and teaching.

- Strategic Plan Goal - Foster a Supportive Campus Community

The Center's program of research will require bringing together scholars from disparate disciplines to address issues that lie at the interface of many areas of expertise. The Center will work actively to foster an open environment for scholarship and outreach that respects the importance of diversity of participation and civility of interaction.

- Strategic Plan Goal - Develop a Campus-Wide Program in Technology, Learning and Society
  CU 2010 Goal - University without Walls

The Center's focus positions it well to contribute direction to the University's goal of being a leader in developing the workforce of the 21st century.

3. Institutional Capability for Implementing the Unit

CIRES currently houses five existing centers. Consequently, the institutional capability exists at CIRES for overseeing and implementing centers. This capability includes administrative infrastructure (including financial management), office space, and computational resources.

4. Administrative Structure

The Center will be led by a Director, with the assistance of a Managing Director. The Center Director will be selected by the CIRES Director after consultation with the External Advisory Board of the Center. The Center Director shall be a member of the faculty of the University of Colorado. The Managing Director will be selected by the Center Director. The Center Director is formally responsible for providing overall direction for research, teaching, and outreach, and for reporting on Center activities as requested. The CIRES Chief Financial Officer is responsible for oversight of all CIRES' budgetary matters. The Center's Managing Director is responsible for management of the Center's budget. The Center will encourage participation by faculty and professionals from all University of Colorado campuses, other higher educational institutions, government agencies, and the private sector.

5. By-Laws

See attached.

6. Resource Implications

The Center will support its activities through two routes: (1) Center staff will seek to develop a lasting endowment in

support of the Center's core operating expenses, described in more detail in the Center's Development Plan; and (2) the Center will secure funding for specific research projects through traditional agency, foundation, and other competitions.

A Center goal is to become self-funded. Unless determined through other agreements, creation of the Center will involve no additional commitments from either the University or NOAA beyond those associated with the CIRES MOU and obligations presently in place. Because CIRES is assuming responsibility for the Center's infrastructure needs, impacts on the University should be minimal.

A five-year financial plan is appended. All expenditures are contingent on the continued funding by NOAA of the Cooperative Agreement that underwrites CIRES and has been in place for 30 years. All Center personnel funded through the Cooperative Agreement are temporary and their appointments are contingent on funding availability.

BY-LAWS

Center for Science and Technology Policy Research
Cooperative Institute for Research in Environmental Sciences
University of Colorado at Boulder
August 2002

Motto: "Science Serving Society"

Mission Statement

The mission of the Center for Science and Technology Policy Research is research, education, and outreach at the interface of science, technology, and decision making.

1. Purpose

The Center for Science and Technology Policy Research (the Center) is established within the Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado-Boulder, to focus on research, education, and outreach at the interface of science, technology, and the needs of decision makers in public and private settings. The Center's research will be highly integrated with the ongoing activities of CIRES, the National Oceanic and Atmospheric Administration, the University, and the broader science and technology community.

2. Elaboration of Purpose

The Center strives to be a national and international leader in research, teaching, and outreach in the areas of science policy, technology policy, and technology assessment. Each of these areas is described below:

- Science policy. The traditional scholarly interest in science policy has for many years been captured by the phrases "science for policy" and "policy for science." The Center will explore how scientific information is linked to decision making and will also examine governance of the scientific enterprise with topics that range from broad federal government resource allocation issues to the practice of peer review.

- Technology policy. Technology policy refers to the interrelationship of government, academia, and the private sector, and their shared goal of enhancing economic vitality through the transfer of knowledge to useful products and processes. Technology policy research seeks to understand these relationships and to develop, evaluate, and critique them.

- Technology assessment. Technology assessment seeks to integrate knowledge of technological systems with their broader social and policy context as a contribution to the governance of science and technology. Decisions about how to allocate finite (and frequently scarce) resources can be made more effectively when decision makers consider integrated understandings of technology in society.

3. Participation/Membership

a. Staff includes individuals who are supported primarily or exclusively through Center funds.

b. Affiliates are individuals conducting joint research with Center staff but whose primary support is from outside the Center. They are appointed by the Center Director for renewable 2-year terms. Affiliates may be nominated for appointment by self, by a member of the Executive Committee, or by a member of the External Advisory Board. An initial affiliate appointment or its renewal requires advice and consent of the Executive Committee. Center Affiliate appointments can take several forms:

   i. University of Colorado Faculty Affiliates are members of the faculty of the University of Colorado who through research, education, or outreach have expressed interest in collaborating with Center personnel in support of the Center's mission.

   ii. Faculty Affiliates from outside the University of Colorado are members of the faculty of a university or college other than the University of Colorado who through research, education, or outreach have expressed interest in collaborating with Center personnel in support of the Center's mission.

   iii. CIRES/University of Colorado Research Affiliates are non-faculty employees of CIRES or the University of Colorado who through research, education, or outreach have expressed interest in collaborating with Center personnel in support of the Center's mission.

   iv. Non-CIRES/University of Colorado Research Affiliates are from institutions other than CIRES or the University of Colorado who through research, education, or outreach have expressed interest in collaborating with Center personnel in support of the Center's mission.

c. Visiting Scholars are scholars affiliated with other institutions who, for the period of their visit, are appointed by the Center Director to visiting positions in residence within the Center.

d. Students are enrolled in degree programs at an institution of higher education and may receive support from Center awards.

Unless otherwise specified, the rights, privileges, and responsibilities of Center staff, affiliates, visiting scholars, and students are governed by the administrative policies and procedures of the University of Colorado.

4. Governance

The Center is led by the Director with the assistance of the Managing Director. The Center Director is responsible for management of Center research and related activities, Center personnel, and reporting on Center activities. He or she is advised in this capacity by:

i) an internal Executive Committee of the Center. The internal Executive Committee shall consist of no less than three Center staff as defined in 3(a), which shall include the Center Director. Executive Committee members other than the Center Director shall be appointed by the Center Director. In addition, the CIRES Director shall serve on the internal Executive Committee in ex officio status. The Executive Committee shall meet at regular intervals (usually bi-monthly during the academic year) to attend to the administrative matters of the Center.

ii) an External Advisory Board which shall consist of the CIRES Director and no more than three others who shall be selected by the Executive Committee and approved by the CIRES Director, and who shall serve two-year terms. The External Advisory Committee shall meet at least once each calendar year.

During travel by the Center Director or upon delegation, the Managing Director shall assume the Center Director's responsibilities.

The CIRES Chief Financial Officer is responsible for oversight of all CIRES' budgetary matters. The Center's Managing Director is responsible for management of the Center's budget.

5. Selection and Appointment of Director and Managing Director

The CIRES Director shall select the initial Center Director and, after consultation with the External Advisory Board, successor Center Directors. The Center Director shall be a member of the faculty of the University of Colorado.

The Center Director shall select the Managing Director.

6. Amendments

The CIRES Director gives final approval to recommendations for amendments to these by-laws that are based on a majority vote of the Executive Committee.

Grant Activity: Current and Submitted Grants 2001-2002

Funding Agency	Title
CIRES	Use of Multi-Model Super-Ensemble Techniques in Hydrology
CIRES	An Integrative Framework for Water Quantity and Quality Decision Making in the Face of Climate Variability
CWCB	Experimental Medium-Range Forecasts for Colorado River Forecasting
DOE	Investigation of the Spatial and Temporal Variations of the Seasonally Frozen Ground in the Contingent United States
National Science Foundation	Extreme Events
National Science Foundation	Atmospheric Sciences Policy Education and Network (ASPEN) Program
National Science Foundation	Collaborative Research: ITR Linked Environments for Atmospheric Discovery/LEAD
National Science Foundation	REU Site: Climate Modeling and Societal Impacts: Scientific, Political, and Philosophic Themes
National Science Foundation	COLLABORATIVE RESEARCH: A Land Surface Model Hind-Cast for the Terrestrial Arctic Drainage System
National Science Foundation	COLLABORATIVE RESEARCH: Hydro-Climatology of the Major Eurasian Arctic Drainages
National Science Foundation	COLLABORATIVE RESEARCH: Local, Regional, and Remote Effects of Northern Hemisphere Snow Cover on Western U.S. Climate and Water Resources: A Multiscale Investigation
NOAA	Understanding and Enhancing the Linkages Between Decision-Making and Carbon Cycle Research
NOAA	Evaluation of Seasonal Climate Forecasts from the Perspective of their Usability
NOAA	One-Way and Two-Way Coupling of Atmospheric and Hydrologic Models
NOAA	Development of Operational Hydrologic Forecasting Capabilities
NOAA	Western Water Assessment
NOAA	Understanding the Spatio-Temporal Variability of the North American Monsoon: Implications to Water Resources Management in the South Western U.S.
U.S. Weather Research Program	Atmospheric Sciences and Policy Education Network (ASPEN) Program

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