CSTPR

UNIVERSITY OF COLORADO

Center for Science and Technology Policy Research

CREATING NEW KNOWLEDGE AND IMPROVING THE WAYS BY WHICH SCIENCE AND TECHNOLOGY POLICIES ADDRESS SOCIETAL NEEDS

Annual Report
July 1, 2008 - June 30, 2009

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

Center for Science and Technology Policy Research

2008 - 2009 Annual Report

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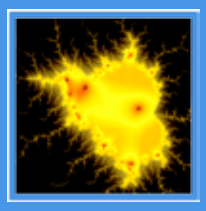
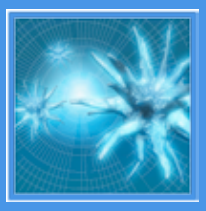
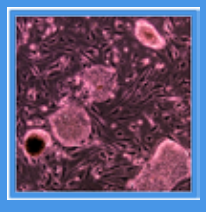
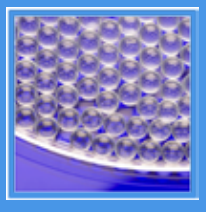
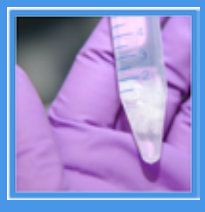






2008 - 2009 Annual Report

The Center for Science and Technology Policy Research (the Center) was 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 is highly integrated with the ongoing activities of CIRES, the National Oceanic and Atmospheric Administration, the University, and the broader science and technology community. The Center works to create new knowledge and improve the ways by which science and technology policies address societal needs, through research, education and service.

Message from the Director

A Year of Research at the Center for Science and Technology Policy Research

The research described in this annual report reflects both our collective and individual efforts to pose and pursue important questions at the intersection of science and policy. Our work is shaped by several factors, especially the curiosity-driven interests of Center faculty, post-docs and graduate students, the big policy questions of our times, and the opportunities that the Center creates for collaborative research. The Center's location in a joint university/NOAA institute dedicated to environmental sciences also shapes our work, as does the track record of now almost a decade of work that offers a base on which to build new projects.

Some of our research stems from persistent puzzles, like why do hazard losses increase despite growing mitigation investments? How can decisions made under the often irreducible uncertainties of climate change be improved, and what contributions can climate science make to that improvement? What sorts of national investments in science and technology pay off? Other projects are driven by policy needs; we feel the press of logic for decarbonizing the economy, for increasing our adaptiveness to climate, and for tracking environmental, science and technology policy trends.

The lists in this annual report reflect the breadth and depth of our efforts, and here I will cite just a few of those themes.

Lisa Dilling, **Betsy Failey**, **Roger Pielke Jr.** and colleagues have posed the question that surely will demand society's attention for decades to come: what purposeful carbon cycle changes make sense, and how should we govern our carbon interventions? While certainly much attention will remain on energy systems and the troubled international efforts to reduce carbon dioxide emissions, new attention has fallen on the possibility of extracting carbon back out of the atmosphere, via direct capture or land uses that alter land surface fluxes; it may be that the ownership and regulatory regimes that affect daily land use represent a major dimension for carbon governance in the future.

In many ways, **Dave Cherney** asks similar questions about ecosystems management, focusing on the commons in land, the elements which give a stake to non-owners. He queries how non-governmental, non-owners, can manifest their preferences in landscapes, not unlike how carbon policy is meant to manifest the needs of global commons in each land owners' backyard. **Marilyn Averill** takes this another step, and adds the judicial dimension, to which non-propertied interests often turn to claim their stake, in land or the atmosphere.

Is the world becoming more hazardous? **Roger Pielke Jr.** began asking this question over a decade ago, about floods, hurricanes, and more recently about earthquakes (with **Kevin Vranes**), and for global disasters generally. As a first result, Pielke and his colleagues have made it clear that hazard loss data, from local to global, are of abysmally-poor quality, falling below "research grade," and have suggested that right now, despite our sense that losses are increasing, we can't really be sure of the components of the trend. Certainly the simple but profound message is that humans continue to put more of themselves and their property at risk, despite long-standing efforts to reduce exposure and to mitigate potential losses. In a master's thesis defended this summer, **Kevin Sharp** showed that small variations in hurricane landfall, interacting with patterns of costal development, can double or halve hurricane impacts. Even the much-discussed possibility that global warming will worsen climate extremes appears to be so weak a signal, if there's any signal at all, that coastal development trends overwhelm it and are likely to do so for decades to come. **Shali Mohleji** takes up the gauntlet to explore the quality of a number of disaster datasets, with the next step to evaluate the best data for signals of climate change and disaster policy, and **Jessica Weinkle** explores how we can use loss data to reveal social patterns that, it seems, have us making things worse as we try to make them better.

Against common concerns that some proposed climate solutions are too costly or too risky, **Ben Hale** posits a wrongs-based approach to evaluating human-induced global change. This important analytical twist recasts proposals for "geo-engineering" the climate in terms not of costs and benefits, but in terms of who will be wronged. Doing so uncovers a profound conundrum of human agency: how do we fix past problems without further wrongdoing? This line of work will certainly be called on to illuminate the ethical and governance questions that frame not only any ultimate application of geo-engineering, but even

geo-engineering research and experimentation in the near-term.

Bobbie Klein, with colleagues **Doug Kenney** and others, add water to the list of atmosphere and land in our research portfolio, delving into what turns out to be one of the biggest questions facing the American West: how should we use water resources in an era where supply and demand are closely matched and even small variations of either seem to cause increasing impacts? Touching again on the tricky detection of environmental trends in complex resource systems, they analyze whether the progress of runoff earlier and earlier in the year has stressed the water rights system. Apparently not yet, but the potential for conflict appears to be growing.

Max Boykoff joined the center in August, 2009, and starts his time at CU by introducing into our work an important global political-economic structure, the media, and asking if the media message on global warming is one of empowerment or disempowerment, and what role it will play in the coming re-alignment of energy and climate-sensitive resource systems. **Ursula Rick** traced media assessments of sea level rise projections as those numbers become the focus of climate change worries.

New graduate student **Kristin Gangwer** joined us in August, and is working with **Bill Travis** on the Western Water Assessment-funded effort to develop a suite of drought impacts and vulnerability indicators for the region. **Melanie Roberts** further pressed home questions of useable knowledge, examining NSF requirements that researchers identify applied benefits of projects; **Rad Byerly** made the science-policy connection via his membership on the state's air quality board, and brought the lessons back to academia. Visitor **Ila Cote** took time out of the regulatory fray in Washington to reflect on expert knowledge, models and effectiveness of environmental protection.

In my first year at the Center I have watched it expand and pursue new projects and themes. By the end of summer, 2009, we had submitted major grant proposals to examine whether water manager responses to shortages would also help them cope with climate change, how land use changes regional ecosystems, how decisions on federal lands would articulate with climate uncertainty, and whether we could measure changing drought vulnerability. We began what could only be called the very early phases of a technology assessment of climate geo-engineering. In all this we are aided by a great staff, with **Ami Nacu-Schmidt** leading outreach, **Sarah Leshan** keeping the office going, and **Bobbie Klein** managing it all.

A common thread in our work is uncertainty, maybe even irreducible complexity and uncertainty, which hints that we may never have reliable models, of toxicity, of pollution, of climate, or even of our own research enterprise, to give us a clear view of the future, to make, as it were, policy choices for us. So we will pursue, in the coming year, those persistent questions: What sort of climate science do we need to fashion an effective climate change response policy? How can we manage terrestrial carbon within a fragmented property system lacking incentives? Can we reduce the rising tolls of natural disasters? Can we make the nation's research portfolio more attuned to policy-makers' needs? Each of these questions could consume a life's work. Fortunately, some economy of scale and collaboration can be achieved if we marshal resources well, and continue to build on the Center's staff, visitors, alumni, and advisors, and allow it to evolve, driven, especially now, by its five resident faculty (the most in its history), its post-docs and visitors, and the eager students that show up at our door ready to do policy, and policy-relevant, research, to pursue the CIRES goal of science in service to society.

William R. Travis
Director
October, 2009

The Center at a Glance 2008-09

The Center is within the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado at Boulder. It was founded in 2001.

Number of unique website visitors

511,264

Number of publications

24

Number of Center's Science Policy E-Briefing recipients

3,596

Number of talks at or sponsored by the Center by non-Center personnel

17

Number of subscribers to Ogmius, Center's quarterly newsletter

213

Number of Center students who have graduated since 2001 (6 PhDs, 2 Masters, 1 Masters/MBA, 1 Law)

10

Number of media references to the Center and/or its personnel

90

Number of graduate students who worked at the Center this year

6

Number of presentations by Center staff and students

41

Center Highlights

Bill Travis, an Associate Professor of Geography who has taught for more than 20 years at CU-Boulder and was the former director of the university's Natural Hazards Center, became our new director last September.

We completed a faculty search process and **Max Boykoff** of the Environmental Change Institute, University of Oxford, joined us in August.

Roger Pielke, Lisa Dilling, and CSTPR Affiliate Dan Sarewitz were awarded a supplement from NSF for their research project **SPARC: Science Policy Assessment and Research on Climate**. They will extend SPARC work on the "supply of science" theme to climate adaptation efforts, and also further analyze the demand side of the equation, comparing the US and European experience in climate policy.

Roger Pielke, Jr. organized a highly successful international workshop on the **Science of Science and Innovation Policy**.

Lisa Dilling, Marilyn Averill, and Betsy Failey attended the **Copenhagen International Scientific Congress Meeting** in March, and discussed their experiences at a Center-organized forum.

We have been taking a closer look at various aspects of **geo-engineering** including **air capture** - the direct removal of carbon dioxide from the ambient air. We have also started to develop several research projects focused on **climate change adaptation**.

We cosponsored (with the CU Energy Initiative) a well-attended lecture and panel discussion series last fall on the **energy/climate challenge** that coincided with the presidential campaign, culminating in a keynote address by UC-Berkeley Professor Daniel Kammen, a noted energy expert who served as President Obama's senior environmental policy advisor during the 2008 campaign.

Center Highlights

Lisa Dilling and **Ben Hale** organized a highly regarded Environmental Studies colloquium series this spring that examined three policy issues from several perspectives.

Roger Pielke, Jr. and his book **The Honest Broker** were featured on the front page of the New York Times Science section.

Lisa Dilling was appointed an editor of Weather, Climate and Society and a member of the President's Advisory Committee on University Relations for UCAR.

Dave Cherney received the CIRES Graduate Student Seminar Series "Best Talk" Award. **Ursula Rick**, who recently received her Ph.D. from the University of Colorado studying the Greenland ice sheet, joined us as a postdoctoral researcher working on climate change adaptation and scientific uncertainty associated with sea level rise.

We attained **Buff Energy Star** status for reducing energy usage at our historic bungalow by at least 5 percent over the previous fiscal year.

Sarah Leshan became our new office manager in July 2008. She received the Center's 2008 Outstanding Performance Award.

Melanie Roberts, former AAAS Science and Technology Policy Fellow in both the National Science Foundation (2007-08) and in the office of Senator Jeff Bingaman (2006-07), and **Dr. Ila Cote**, former director of EPA's National Center for Environmental Assessment – Research Triangle Park Division, and science advisor to EPA senior management who is on sabbatical from the EPA, joined our staff this year. Both Melanie and Ila bring their extensive and valuable Washington, DC experience to the Center.

Research

- **Climate Science Policy**
- **Carbon and Land Use Decision Making**
- **Science of Science Policy**
- **Drought, Climate Change, Water Institutions and Society**
- **Geo-engineering**
- **Publications**

The Center's research this past year focused on several overarching themes at the intersection of science and decision making.

Climate Science Policy (Pielke, Dilling)

The NSF-funded **Science Policy Assessment and Research on Climate** ("SPARC") project has been examining how climate science policies can better support climate-related decision making in the face of fundamental and often irreducible uncertainties. SPARC research focuses on two themes. The Sensitivity Analysis theme focuses on disentangling the various factors that lead to policy impacts in areas such as climate impacts on ecosystems, natural disasters, and energy and emissions scenarios. The Reconciling Supply of and Demand for Climate Research theme focuses on developing science policies that are responsive to the needs of decision makers. SPARC was recently awarded a one-year supplement to further this work. See, e.g., Dessai, S., M. Hulme, R. Lempert, and R. Pielke, Jr. 2009. Do We Need Better Predictions to Adapt to a Changing Climate? Eos, Vol 90, No. 13, pp. 111-112; Pielke, Jr., R. A., 2009. An Idealized Assessment of the Economics of Air Capture of Carbon Dioxide in Mitigation Policy, Environmental Science & Policy, Vol. 12, Issue 3, pp. 216-225.

Carbon and Land Use Decision Making (Dilling, Failey)

In order to understand the current pattern of carbon fluxes on managed land, and any future potential for land use to play a greater role in sequestering carbon, the NOAA-funded **Scales of Decision-Making and the Carbon Cycle** is examining the drivers of land use decision making at different scales, and their intersection with new imperatives and opportunities coming from climate mitigation goals. This past year researchers conducted a case study on land use decision making in Colorado, a western state with significant portions of land

managed by U.S. Federal governmental agencies in addition to privately-owned agricultural, grazing and forested lands. The main goal was to put together a first-order look at the types of decision makers involved in managing land, what influences their decisions, and how the potential for storage of additional carbon on land might vary according to ownership category and land vegetation type. The study has three significant components: 1. examining ownership patterns; 2. calculating the flux and carbon storage by land ownership category; and 3. illuminating the influences on land use decisions at different scales.

Another goal of this project is to understand the current context of land use decision making in different sectors and examine the potential for future carbon policy to be effective given this context. This study also examined land use decision making in Colorado from a variety of ownership perspectives, including US Federal land managers, individual private owners, and policy makers involved in land use at a number of different scales. It also examined the role of information in making decisions, and found some interesting contrasts between Federal and private land owner practices.

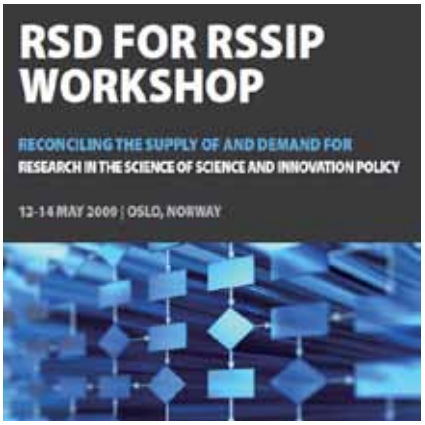
Products:
Failey. E. and L. Dilling, 2008. Understanding Human Decision Making as a Driver for Carbon Sequestration on Land (poster presentation, 2008 AGU Fall Meeting, December 15-19, San Francisco, CA)

Dilling, L. and E. Failey, 2008. Management of carbon across sectors and scales: Insights from land use decision making (talk, 2008 AGU Fall Meeting, December 15-19, San Francisco, CA)

E L Failey and L Dilling. "Assessing the carbon stewardship landscape in Colorado" (in prep).

Science of Science Policy (Pielke)

The NSF-funded **Reconciling the Supply of and Demand for Research in the Science of Science and Innovation Policy** project sponsored a workshop in Oslo, Norway this past May involving academics, practitioners, and those with feet in both worlds to examine how science policy research does (or does not) support the information needs of science policy decision makers, and steps that might be taken to improve such connections. The central question of the workshop was: How can scholars who



study science and innovation policy contribute more effectively to the needs of policy makers facing decisions about science and innovation policy? Fifteen papers were presented at the workshop including The Neglected Heart of Science Policy: Reconciling Supply Of And Demand For Science, Daniel Sarewitz, Consortium for Science, Policy, and Outcomes, Arizona State University, and Roger A. Pielke, Jr., Center for Science and Technology Policy Research, University of Colorado; The Neglected Heart Of Scientists: Commentary On Sarewitz And Pielke, Barry Bozeman, University of Georgia; Do We Need Better Predictions To Adapt To A Changing Climate?, S. Dessai, M. Hulme, R. Lempert, and R. Pielke, Jr.; and Remarks On The Conference Question: "How Can Scholars Who Study Science And Innovation Policy Contribute More Effectively To The Needs Of Policy Makers. Facing Decisions About Science And Innovation Policy?", John Marburger, Stony Brook University and former science advisor to President George W. Bush.

Drought, Climate Change, Water Institutions and Society (Klein)

A Western Water Assessment-funded research project, **The Impact of Earlier Spring Snowmelt on Water Rights and Administration**, examined whether the growing mismatch between seasonal water rights and earlier runoff in the Intermountain West has resulted in conflict between supply and demand. It found that no significant on-the-ground problems associated with the growing mismatch

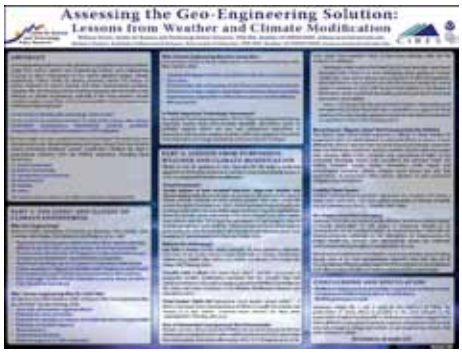
of rights and hydrographs has yet to emerge. It remains unclear exactly where and how intensely these problems may be manifest, and whether they will present mostly as legal or water management problems. See Kenney, D., Klein, R., Goemans, C., Alvord, C., and Shapiro, J., 2008. The Impact of Earlier Spring Snowmelt on Water Rights and Administration: A Preliminary Overview of Issues and Circumstances in the Western States, Final Project Report (review draft): September 3.

Geo-engineering (Pielke, Travis, Hale, Dilling)


An idealized assessment of the economics of air capture of carbon dioxide in mitigation policy

The Center is examining geo-engineering – defined as efforts to deliberately manipulate the Earth's climate to counteract the effects of global warming from greenhouse gas emissions – from several perspectives. **Roger Pielke, Jr.'s** study of air capture found that even at a relatively high cost per ton of carbon, the costs of air capture are directly comparable to the costs of stabilization using other means as presented by recent reports of the IPCC and the Stern Review Report. Pielke, Jr., R. A., 2009. An Idealized Assessment of the Economics of Air Capture of Carbon Dioxide in Mitigation Policy, Environmental Science & Policy, Vol. 12, Issue 3, pp. 216-225.

Ben Hale is looking at the relationship between practices of assigning moral responsibility and geo-engineering technologies that aim to remediate pollution. He asserts that proposals such as ocean fertilization reveal the true moral nature of many environmental problems and, in doing so, offer a way forward requiring assessment not only of facts but of values and value commitments as well, demanding a justificatory methodology that goes beyond strict balancing of benefits over harms. Hale and **Lisa Dilling** have an article on the ethics of ocean fertilization in review at Science, Technology and Human Values.


Assessing the Geo-Engineering Solution: Lessons from Weather and Climate Modification

Bill Travis and Barbara Farhar of the Institute for Behavioral Sciences (IBS) presented a poster at the 2008 Energy Initiative Research Symposium titled "Assessing the Geo-Engineering Solution: Analogs from Weather and Climate Modification." Potential geo-engineering technologies were examined using an inventory from the weather and climate modification experience. Bill also participated on a panel discussion titled "From Research to Field Testing and Deployment: Ethical Issues Raised By Geo-engineering" which was part of the National Academies' workshop "Geo-engineering Options to Respond to Climate Change: Steps to Establish a Research Agenda." The workshop was intended to inform the work of the America's Climate Choices panels and steering committee by examining a number of proposed geo-engineering approaches with an emphasis on the research needed to better understand the potential efficacy and consequences of the various approaches.

PUBLICATIONS

The Center published 24 articles in peer-reviewed journals and the popular media this past year. The complete list is included in Appendix C.

Education Activities

- **Graduate Certificate Program in Science and Technology Policy**
- **Students at the Center**
- **Student Alumni**

Graduate Certificate Program in Science and Technology Policy

The Graduate Certificate in Science and Technology Policy, a rigorous educational program to prepare graduate students for careers at the interface of science, technology, and decision making, is completing its fifth year. Eighteen students are currently enrolled in the certificate program, and eighteen others have completed the program. Program alumni have served on the staff of the House Science Committee, interned for the Office of Management and Budget, staffed a congressional office, and served in postdoctoral positions in science policy.

Center staff and affiliates taught the following courses this past academic year:

- ENVS 5000: Policy, Science, and the Environment – Roger Pielke, Jr.
- ENVS 5100: Science and Technology Policy – Lisa Dilling
- ENVS 5110: Critical Introduction to Science, Technology, and Society (STS) Studies – Carl Mitcham (CO School of Mines)
- ENVS 5120: Quantitative Methods of Policy Analysis – Jason Vogel
- ENVS 5720: The Problem Orientation – Roger Pielke, Jr.

Students at the Center

The following graduate students worked with the Center over the past year.

Marilyn Averill is a Ph.D. candidate in Environmental Studies. She holds Master's degrees in Public Administration from the Kennedy School of Government and in Educational Research and Evaluation Methodology from the University of Colorado, and a law degree from the University of Colorado. Before returning to graduate school, Marilyn was an attorney with the Office of the Solicitor, United States Department of the Interior, where she provided

legal advice to the U.S. Fish and Wildlife Service and the National Park Service. Her research interests focus on international environmental governance, the politics of science, and science and technology policy, particularly in the context of global climate change. Her most recent work involves the use of science and the treatment of uncertainty in litigation relating to climate change, and the effects these cases may have on law, science, and policy. Her tentative dissertation topic is "Who Runs the Greenhouse? The Role of the Federal Judiciary in U.S. Climate Policy." She is a member of the Planning Committee (essentially the Board) for the Research and Independent Non-Governmental Organizations (RINGOs) to the United Nations Framework Convention on Climate Change.

David Cherney is a Ph.D. candidate in Environmental Studies and a research associate with the Northern Rockies Conservation Cooperative in Jackson, WY. He holds a Master's degree in environmental management from Yale University and a Bachelor's degree in environment, economics, and politics from Claremont McKenna College. David serves on the executive council for the Society of Policy Scientists and on the program committee for the Society of Conservation Biology's Social Science Working Group. David won the 2008-2009 CIRES Graduate Student Seminar Series "Best Talk" Award. David's dissertation research focuses on conservation non-governmental organizations in greater Yellowstone.

Shali Mohleji is a Ph.D. candidate in Environmental Studies. Shali graduated from the University of Virginia with a Bachelor's degree in Environmental Sciences, with a concentration in Atmospheric Sciences. She received her M.S. in Atmospheric Sciences from Purdue University. Following Purdue, she worked in private industry as an environmental consultant specializing in air pollution as well as homeland security projects. Since becoming a student at the Center, Shali has spent two summers interning at the Office of Management and Budget. Her interests are in the federal budget process, agency management, and science funding. Shali's current research involves an assessment of national and international disaster loss databases. The end-product will be a meta-database accompanied with recommendations of best uses for decision makers, insurance companies, humanitarian groups, scientists, and other users. She participated in the Department of Homeland Security Hazards Agenda Setting Colloquium in December 2008.

Erin Moore is a Ph.D. candidate in the Environmental Studies Department. Erin received a BA in English Literature from the University of Houston and an MA in Philosophy from the University of North Texas. She also spent a year researching at Arizona State University. Her research interests are in environmental philosophy; science, technology, and society; and the philosophy of science and technology policy. She has done research on environmental ethics and space policy, the contrast between technology and eros in New Orleans leading up to Hurricane Katrina, and environmental ethics in the Cape Horn region of southern Chile.

Kevin Sharp is a graduate student in Geography who worked with Bill Travis and Lisa Dilling on the effect of small variations in hurricane landfall, interacting with patterns of costal development, on hurricane impacts.

Jessica Weinkle is a Ph.D. student in the Environmental Studies Program with a secondary core in Policy. While working on her MA in Climate and Society at Columbia University she became interested in natural hazards and risk perception and communication. She has come to Colorado to continue to pursue those interests. She is also considering studying for her elementary education certificate while attending the University. Jessica did her undergraduate work in zoology at the University of Texas at Austin.

Education

Student Alumni

Our alums are working in a variety of interesting positions at the interface of science and decision making and continue their outstanding achievements:

Adam Briggle, ENVS Ph.D. 2006, has accepted a tenure track assistant professor position at the University of North Texas in the Department of Philosophy and Religious Studies, one of the leading environmental philosophy programs. His book on the President's Council on Bioethics is in press.

Erik Fisher, ENVS Ph.D. 2006, has accepted an assistant professor position with the political science department at Arizona State University. Erik also recently received a $540k NSF grant "Socio-Technical Integration Research Project" to study the extent to which collaborations between social and natural scientists working alongside one another in research laboratories may advance responsible innovation. The initial research that the grant was based on was conducted through CSTPR when Erik was a graduate student here.

Joel Gratz received a Masters in meteorology and policy as well as an MBA and is working at ICAT Managers, a Boulder-based hurricane and earthquake insurance company, in a role that combines both science and business responsibilities.

Nat Logar, ENVS Ph.D, is a postdoctoral researcher with the Consortium for Science, Policy and Outcomes at Arizona State University.

Jessica Lowrey, who received her Masters in Environmental Studies and has worked with the Western Water Assessment in Boulder, entered law school at CU this fall.

Genevieve Maricle,who received her Ph.D in ENVS and has been working as a postdoctoral researcher with the Consortium for Science, Policy and Outcomes at Arizona State University, received a 2009-2010 AAAS Diplomacy Fellowship which will place her in the U.S. Agency for International Development (USAID), where she will work in areas of international science policy as it relates to the agency's mission to extend assistance to countries recovering from disaster, trying to escape poverty, and engaging in democratic reforms.

Elizabeth McNie, ENVS Ph.D., recently completed her first year at Purdue University as an Assistant Professor of Political Science & Earth and Atmospheric Sciences where she is affiliated with the Purdue Climate Change Research Center. Elizabeth was awarded the Society for the Policy Sciences 2008 Student Paper Prize for her article, "Reconciling the Supply of Scientific Information with User Demands: An Analysis of the Problem and Review of the Literature," Environmental Science & Policy 10 (2007) 17-38.

Anne Ruggles received her law degree after completing an externship at the Center. She is the Executive Director of the Alaska Bird Observatory.

Shep Ryen received his Masters in Environmental Studies and served on the staff of the U.S. House of Representatives Committee on Science in Washington, D.C. from 2005 until 2009. He recently accepted a position with the Government Accountability Office as an Analyst.

Jason Vogel, ENVS Ph.D., is a consultant at Stratus and teaches the Quantitative Methods course for the Science and Technology Policy certificate program at CU. He was awarded the Society for the Policy Sciences 2008 Harold D. Lasswell Prize, along with Elizabeth Lowham, for their article, "Building Consensus for Constructive Action: A Study of Perspectives on Natural Resource Management," Journal of Forestry (January/February, 2007) 20-27.

Outreach Activities

- **The Energy and Climate Challenge**
- **Restoring the Earth: No Easy Answers**
- **Reflections on the Copenhagen International Scientific Congress Meeting**
- **Other Outreach Efforts**

The Energy and Climate Challenge

In partnership with the CU Energy Initiative, the Center cosponsored a lecture and panel discussion series during fall semester to examine the challenge of meeting rapidly rising global energy demand while simultaneously reducing planet-warming greenhouse gases. The series was intended to foster discussion and debate on these issues to coincide with the 2008 presidential campaign.

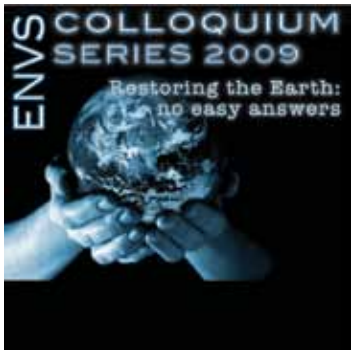
The first panel "The Energy and Climate Challenge: Have We Underestimated the Size of the Challenge?", discussed a paper by Pielke, Wigley and Greene in the journal Nature arguing that the Intergovernmental Panel on Climate Change (IPCC) underestimated the technical challenge of responding to climate change. Panelists included Roger Pielke, Jr., CIRES Center for Science and Technology Policy Research; Tom Wigley, National Center for Atmospheric Research; and Frank Laird, Graduate School of International Studies, University of Denver. Carl Koval, CU Energy Initiative director, moderated the discussion.

The second panel "Do We Need a 'Manhattan/ Apollo Project' To Solve the Energy/Climate Problem?" addressed whether greater use of today's energy technologies will take us to climate stabilization, or whether we need a large-scale investment in new energy research and development on the order of the Manhattan Project that developed the atomic bomb in WWII and the Apollo Project that sent a man to the moon. Panelists included Rad Byerly, Jr., Center for Science and Technology Policy Research; Craig Cox, Interwest Energy Alliance; Pete Geddes, Foundation for Research on Economics & the Environment; Chuck Kutscher, National Renewable Energy Laboratory; and Gregory F. Nemet, La Follette School of Public Affairs and Nelson Institute for Environmental Studies University of Wisconsin. Paul Komor of the CU Energy Initiative moderated the discussion.

The final event was a keynote address by UC-Berkeley Professor Daniel Kammen "Energy and

Climate Opportunities for a Green New Deal" and a panel discussion by Jean Fruci, Michael Rodemeyer, and Tom Weimer, current and former congressional staffers working in the energy and climate arena, to open the second annual Energy Initiative Research Symposium.

Restoring the Earth: No Easy Answers



Lisa Dilling and Ben Hale organized a colloquium series through Environmental Studies during spring semester consisting of three panel discussions that included one scientist, one humanist, and one policy expert offering three different perspectives on current environmental issues.

The first topic was Dam Removal: Advocacy, Resistance, & Feasibility. William Lewis, CIRES Center for Limnology, presented, and Mark Squillace, CU Law School and Caitlin Crouch, ENVS, commented on his remarks.

The second topic was Food Politics & Policy: Cultivation or Conservation? Competing Imperatives for Land Use. Steve Vanderheiden, CU Political Science, presented, and Alan Townsend, EBIO/ENVS and Lorine Giangola, ENVS, provided comments.

The final topic was The Aftermath of Hurricanes Katrina and Rita - Doubt and Restoration: Coastal Louisiana. Eugene Turner, Coastal Ecology Institute at Louisiana State University, presented, and Michael Zimmerman, Phil and ENVS and Shali Mohleji, ENVS, provided comments.

Reflections on the Copenhagen International Scientific Congress Meeting

In March 2009 the University of Copenhagen hosted an international scientific congress on climate change. The main aim of the congress was to provide a synthesis of existing and emerging scientific knowledge necessary in order to make intelligent societal decisions concerning application of mitigation and adaptation strategies in response to climate change. The scientific congress took place in anticipation of the United Nations Climate Change Conference (COP-15), which will be held in Copenhagen November-December 2009. The Danish government will hand over the results of the scientific congress to decision makers at COP-15.

Several CU researchers and graduate students, including the Center's Lisa Dilling, Betsy Failey, and Marilyn Averill, attended the Copenhagen meeting. The Center organized a forum for these and other participants at the Copenhagen meeting to reflect on their experiences.

Other Outreach Efforts

Konrad Steffen - February 26, 2009

In addition, Center personnel gave 41 presentations at academic conferences and other events around the world, and the Center hosted 17 talks by affiliates and visitors (see Appendix D for a complete list). Two of our distinguished speakers were EPA risk assessment expert and Center visitor Ila Cote who addressed "Risk Assessment at the Environmental Protection Agency: Science, Policy and Politics", and Greenland ice sheet expert Konrad Steffen who provided an update on "Changes in the Arctic Ice Cover."

Other ongoing Center outreach efforts include a quarterly newsletter, Ogmius; an email briefing sent to more than 3,500 decision makers in Washington, DC and elsewhere; and an extensive web site, sciencepolicy. The Center's popular and well-regarded science policy

weblog, Prometheus, underwent a significant revision in 2008 to greatly improve its appearance and functionality. According to website tracker Alexa, Prometheus was the 4th most popular site on the University of Colorado's website, ranking higher than the library's website. Prometheus was retired in June and replaced by Roger Pielke, Jr's new science policy weblog.

The Center and its personnel continue to receive international media attention. In the past fiscal year we have been quoted, cited, or referred to 90 times by the following media (see Appendix E for complete list): Albuquerque Journal, Austin American-Statesman, BBC News (UK), Boston Globe, Boulder Weekly, Carbon Capture Journal, Casper Star Tribune, Charleston Daily, Christian Science Monitor, Colorado Daily, Daily Camera, Daily Climate, Denver Post, Economie (France), Energy Tribune, European Commission, Forbes, Fox Business, Guardian (UK), Hawaii Reporter, Houston Chronicle, KGNU radio, Nature (magazine and blog), Natuurwetenschap & Techniek (Netherlands), New Scientist, New York Times (newspaper and blog), NPR radio, Register (UK), Rocky Mountain News, Salon, Science magazine, Sydney Morning Herald (Australia), Time magazine, Times Online, Wall St. Journal (newspaper and blog), Washington Post (newspaper and blog).

People

- Center Staff
- Affiliates
- Research Affiliates
- Visitors and collaborators
- Boards and committee membership

Staff

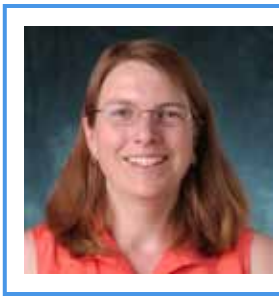
Rad Byerly

Rad Byerly is a Research Scientist who has worked at the Center since its inception in 2001. Rad received his Ph.D. in experimental atomic and molecular physics at Rice University in 1967. He is the former chief of staff for the U.S. House of Representatives Committee on Science and Technology. Since retiring he now works with students to offer his perspective as a practitioner and with faculty on various projects. He serves on the State of Colorado Air Quality Board.

Ila Cote

Ila Cote is on sabbatical from the Environmental Protection Agency. She is the former director of EPA's National Center for Environmental Assessment – Research Triangle Park Division, and science advisor to EPA senior management. Her expertise is in public health and environmental risk assessment, and the interface of science and public policy. She is trained as a toxicologist and is a former faculty member of New York University Medical Center's Department of Environmental Medicine, and taught courses in Risk Assessment, and Air Quality Management at Duke University. She has also collaborated with the Environmental Ministries of several foreign governments to develop their environmental policies and programs. Her current interests include: strategic planning for next generation risk assessment practices, policy implications of the European Union efforts to gather data on ~100,000 chemicals, and risk assessment and research coordination among federal agencies.

Lisa Dilling



Lisa Dilling received her Ph.D. in biology from the University of California-Santa Barbara. She developed a program in integrated carbon cycle research for the Climate and Global

Change Program of the National Oceanic and Atmospheric Administration, and also helped to develop a national interagency program to study the integrated carbon cycle that links together relevant research in 6 Federal agencies for the U.S. Global Change Research Program (now the U.S. Climate Change Science Program). She spent two years as a scientist with the Environmental and Societal Impacts group of the National Center for Atmospheric Research. Her research at the Center focuses on the use of information in decision making related to climate and, in particular, the carbon cycle. Lisa is an assistant professor in ENVS.

Elisabeth (Betsy) Failey

Betsy Failey graduated with a B.S. in Biology from Davidson College, Davidson, NC in May 2006. In college she participated in various research projects examining the impact of land use change on herptofauna. She served as a research assistant at the Center working on Lisa Dilling's carbon cycle project, and a graduate student in the joint MBA/Environmental Studies program.

Benjamin Hale

Benjamin Hale teaches environmental studies and philosophy at the University of Colorado, Boulder. He works primarily in the area of environmental ethics and environmental policy, though his theoretical interests span much larger concerns in applied ethics, normative ethics, and even metaethics. As for applied questions, much of his work centers on ethical and environmental concerns presented by emerging technologies. He is the co-editor of the journal Ethics, Place & Environment. Before joining the environmental studies program, Benjamin was the Director of the Center for Values and Social Policy in the Philosophy Department at the University of Colorado, Boulder, and earlier was the Interim Director of the Environmental Conservation Education Program at New York University. Benjamin has a Ph.D. in Philosophy from the State University of New York at Stony Brook and an M.P.A. in Natural Resource Policy from the University of Arizona.

Bobbie Klein

Bobbie Klein is the Center's Managing Director. She has a B.A. in political science from the University of Illinois, a J.D. from the University of Wisconsin, and an M.A. in Public Policy from the University of Colorado. Prior to joining the Center she worked at the National Center for Atmospheric Research, and for state and federal appellate courts. Her research focuses on water policy particularly as it relates to drought and demand management.

Sarah Leshan

Sarah Leshan has provided administrative support at the Center since February 2008. Sarah graduated with a B.A. from Michigan State University and received her M.A.L.S. from SUNY Plattsburgh in August 2008. Sarah was the recipient of the Center's 2008 Outstanding Performance Award.

Ami Nacu-Schmidt

Ami Nacu-Schmidt is the Center's Outreach Coordinator and the Center's graphic and web designer. Ami created an attractive new web design for the NSF-funded Reconciling the Supply of and Demand for Research in the Science of Science and Innovation Policy workshop project, http://sciencepolicy.colorado.edu/rsd_for_rssip/.

Roger Pielke, Jr.

Roger Pielke served as the Center's Director since its inception, stepping down in June 2007. Roger joined the faculty of the University of Colorado in July 2001 where he is a

Professor in the Environmental Studies Program and a Fellow of the Cooperative Institute for Research in Environmental Sciences. From 1993-2001 Roger was a Scientist at the Environmental and Societal Impacts Group at the National Center for Atmospheric Research. Roger holds a B.A. in mathematics and a Ph.D. in political science, both from the University of Colorado.

Ursula Rick

Ursula Rick completed her Ph.D. at the University of Colorado, studying meltwater in the Greenland Ice Sheet. Working in a politically charged scientific area got her interested in science policy, specifically energy and climate policy. Since Ursula's Ph.D., she has been working at the Center looking at climate change adaptation research and also at scientific uncertainty and its use in climate policy debates.

Melanie Roberts

Melanie Roberts worked as a visiting postdoctoral fellow at the Center where she was studying how to better utilize university-generated knowledge for societal needs. Previously Roberts was an AAAS Science and Technology Policy Fellow in the office of Senator Jeff Bingaman (2006-07) and in the Division of Social and Economic Sciences at the National Science Foundation (2007-08). In these positions, she took a lead role in several initiatives related to policy for innovation and competitiveness, science and technology advice for Congress, regulatory policy, interdisciplinary and transformative research, and ethics education policy. She completed her Ph.D. in neurobiology and behavior at the University of Washington in 2005. While at UW, she founded both the Biocareers Seminar Series and the Forum on Science Ethics and Policy, an interdisciplinary organization that promotes dialogue about the role of science in society among scholars, the public, and policy makers.

William Travis

William Travis was appointed Director of the Center in September. Bill is an Associate Professor of Geography at the University of Colorado-Boulder. His teaching and research focus on human behavior in the environment, including studies of the human dimensions of climate change, land use and the interaction of people and ecosystems. His latest book, *New Geographies of the American West*, released in spring 2007, examines the driving forces and patterns of land use and development in the American West. His current projects examine social response to extreme climate change, and persistent fallacies in how humans understand nature and react to natural processes.

Affiliates

Affiliates are significant, long-term collaborators or colleagues, on the faculty either at the University of Colorado or other higher education institutions, who share an interest in science and technology policy.

- **Wayne Ambler**, Associate Professor and Director of the Herbst Program of Humanities for Engineers, University of Colorado
- **Krister Andersson**, Assistant Professor, Environmental Studies, University of Colorado
- **Susan Avery**, President and Director of Woods Hole Oceanographic Institution
- **Tom Chase**, Assistant Professor of Geography, University of Colorado
- **Robert Frodeman**, Dept. of Philosophy and Religion Studies, University of North Texas
- **Rudy Juliano**, School of Medicine, University of North Carolina
- **Lisa Keränen**, Assistant Professor of communication, University of Colorado
- **Paul Komor**, Lecturer in the Environmental Studies Program and Education Director for the Renewable and Sustainable Energy Institute
- **Carl Koval**, Professor, Chemistry, University of Colorado, and Faculty Director, Renewable and Sustainable Energy Institute
- **Sarah Krakoff**, Assistant Professor, University of Colorado School of Law
- **Frank Laird**, Associate Professor, Graduate School of International Studies, University of Denver
- **Juan Lucena**, Associate Professor, Liberal Arts and International Studies Division, Colorado School of Mines
- **Roop Mahajan**, Institute for Critical Technology and Applied Science, Virginia Tech
- **Diane McNight**, Fellow, INSTAAR; Professor of Civil, Environmental and Architectural Engineering, University of Colorado
- **Jana Milford**, Professor, Mechanical Engineering, University of Colorado
- **Carl Mitcham**, Professor of Liberal Arts and International Studies, Colorado School of Mines
- **Gunilla Öberg**, Director, Institute of Resources, Environment and Sustainability, University of British Columbia
- **Paul Ohm**, Associate Professor of Law, University of Colorado
- **Jerry Peterson**, Professor, Department of Physics, University of Colorado
- **R. Balaji Rajagopalan**, Assistant Professor and Fellow, CIRES, Department of Civil, Environmental and Architectural Engineering, University of Colorado
- **Joe Ryan**, Associate Professor, Department of Civil, Environmental, and Architectural Engineering, Director of the Environmental Engineering Program, and Environmental Studies Program, University of Colorado
- **Dan Sarewitz**, Director, Consortium for Science, Policy and Outcomes, Arizona State University
- **Doug Sicker**, Assistant Professor, Department of Interdisciplinary Telecommunications, University of Colorado
- **Mark Squillace**, Professor and Director, Natural Resources Law Center, University of Colorado School of Law
- **Kathleen Tierney**, Director, Natural Hazards Center and Professor of Sociology, University of Colorado
- **Phil Weiser**, Associate Professor, Interdisciplinary Telecommunications Program and the School of Law, University of Colorado
- **Qian Ye**, Research Scientist, National Center for Atmospheric Research
- **Tom Yulsman**, Associate Professor, School of Journalism & Mass Communication, co-director of the Center for Environmental Journalism, Environmental Studies Program, University of Colorado
- **Michael Zimmerman**, Professor of Philosophy and Director of the Center for Humanities and the Arts, University of Colorado


Ambler


Milford


Andersson


Mitcham


Avery


Öberg


Chase


Ohm


Frodeman


Peterson


Juliano


Rajagopalan


Keränen


Ryan


Komor


Sarewitz


Koval


Sicker


Krakoff


Squillace


Laird


Tierney


Lucena


Weiser


Mahajan


Ye


McKnight


Yulsman


Zimmerman

Research Affiliates

Research affiliates are collaborators at CU and elsewhere who are not faculty members.

- **Martyn Clark**, National Institute for Water and Atmospheric Research, New Zealand

- **Richard Conant**, Ecosystem Ecologist, Natural Resource Ecology Laboratory, Colorado State University

- **Erik Fisher**, Postdoctoral fellow, Center for Nanotechnology in Society, Arizona State University

- **Robert Kates**, Independent Scholar

- **Douglas Kenney**, Research Associate, University of Colorado Natural Resources Law Center

- **Brad Udall**, Director, Western Water Assessment

- **Jason Vogel**, Senior Associate, Stratus Consulting

Visitors and Collaborators

The Center collaborates with other scientists and professionals from around the world. The following individuals collaborated with Center staff on proposals or projects, co-authored papers with Center staff, or visited the Center in 2008-2009:

- **Christina Alvord**, Western Water Assessment
  Co-author and collaborator
- **Netra Chhetri**, Arizona State University
  Collaborator
- **Susan G. Clark**, Yale University
  Co-author
- **Richard Conant**, Colorado State University
  Collaborator
- **Craig Cox**, Interwest Energy Alliance
  Speaker
- **Jason Delbourne**, Colorado School of Mines
  Speaker
- **Suraje Dessai**, Tyndall Centre
  Co-author
- **Barbara Farhar**, University of Colorado
  Speaker
- **Erik Fisher**, Arizona State University
  Speaker
- **Jean Fruci**, US House of Representatives
  Speaker
- **Pete Geddes**, Foundation for Research on Economics and the Environment (FREE), Speaker
- **Chris Goemans**, Colorado State University
  Co-author and Collaborator
- **Chris Green**, McGill University
  Co-author
- **Lori Hidinger**, Arizona State University
  Collaborator
- **Peter Höppe**, Munich Re
  Speaker
- **Daniel Kammen**, University of California-Berkeley
  Speaker
- **Douglas Kenney**, University of Colorado
  Co-author and Collaborator
- **Chuck Kuscher**, NREL
  Speaker
- **Frank Laird**, University of Denver
  Speaker
- **Kai Larsen**, University of Colorado
  Collaborator
- **Robert Lempert**, RAND Corp.
  Co-author
- **Deane Little**, New Sky
  Speaker
- **Nat Logar**, Arizona State University
  Collaborator
- **Eva Lövbrand**, Linköping University
  Collaborator
- **Genevieve Maricle**, Arizona State University
  Collaborator
- **Mark Neff**, Arizona State University
  Collaborator
- **Jerry Peterson**, University of Colorado
  Speaker
- **Nicole Peterson**, Columbia University
  Speaker
- **Michael Rodemeyer**, University of Virginia
  Speaker
- **Dan Sarewitz**, Arizona State University
  Collaborator
- **Julie Shapiro**, University of Colorado
  Co-author
- **Konrad Steffen**, University of Colorado
  Speaker
- **Mary Tyszkiewicz**, Homeland Security Inst.
  Speaker
- **Tom Weimer**, US House of Representatives
  Speaker
- **Tom Wigley**, NCAR
  Speaker

Boards and Committee Membership

Marilyn Averill

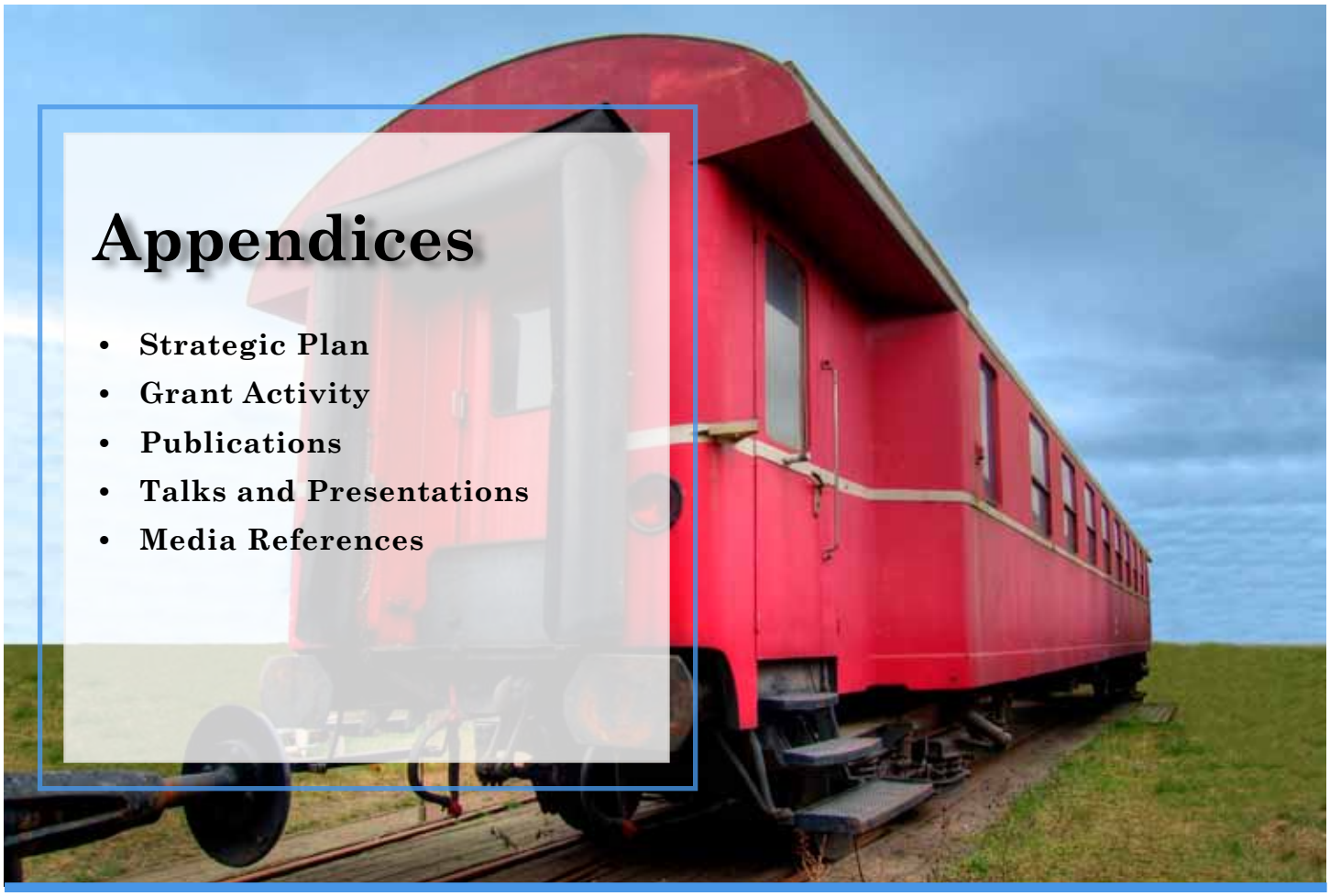
2008-	Member, Steering Committee, Research and Independent Non-Governmental Organizations (RINGOs) to the United Nations Framework Convention on Climate Change

Benjamin Hale

2007-2008	Pre-Professional Advising candidate search committee
2007-2008	ENVS Colloquium Organizer with Diana Nemergut

Roger Pielke, Jr.

2007-	Member, Editorial Board, Nature & Culture
2006-	Member, Editorial Board, Global Environmental Change: Human and Policy Dimensions
2006-	Member, Editorial Board, Environmental Hazards
2006-	Member, Editorial Board, Water Resources Research
2004-	Member, Editorial Board, Environmental Science and Policy
2004-	Member, Editorial Board, Darwin
2003-2005	Member, Editorial Board, International Encyclopedia of Science, Technology and Ethics
2001-2007	Member, Editorial Board, Bulletin of the America Meteorological Society
2001-	Member, Editorial Board, Policy Sciences
2001-	Member, Editorial Board, Natural Hazards Review
2006-2007	CIRES/ENVS Science Policy Faculty Search Committee
2006-2007	CIRES New Fellows Committee
2006	CIRES External Review Committee
2006	Environmental Studies Graduate Curriculum Committee
2006-	Member, Steering Committee, The Nation's Coasts: A Vision for the Future, H. John Heinz III Center for Science, Economics and the Environment
2005-	Member, Advisory Committee, Societal Impacts Group, National Center for Atmospheric Research
2003-	Member, Advisory Committee, Pacific ENSO Applications Center



Appendices

- **Strategic Plan**
- **Grant Activity**
- **Publications**
- **Talks and Presentations**
- **Media References**

A. Strategic Plan

The Center's strategic plan is undergoing revision.

B. Grant Activity July 1, 2008-June 30, 2009

Project/Proposal Title	Source	Amount	Start Date	End Date
Science Policy Assessment and Research on Climate - Decision Making Under Uncertainty	NSF	$2.4 million	10/01/2004	09/30/2010
Science Policy Assessment and Research on Climate - Decision Making Under Uncertainty supplemental award	NSF	$248,576	7/19/2009	9/30/2010
CU Engineering Test Beds for Real-Time Technology Assessment (RTTA)	Subcontract with Arizona State Univ.	$84,000	08/2005	07/2010
Scales of Decision Making and the Carbon Cycle	NOAA	$266,088	05/01/2004	08/31/2008
Reconciling Supply of and Demand for Research in the Science of Science and Innovation Policy	NSF	$39,435	09/01/2008	07/31/2010
Scholar's Award for Investigating the Origins and Evolution of "Basic Research" as a Political Symbol	NSF	$41,050	08/01/2008	07/31/2009
A Drought Impact and Vulnerability Indicator Suite	Western Water Assessment (NOAA)	$50,240	07/01/2009	06/30/2010

C. Publications

July 1 – December 31, 2008

Hale, B., 2008. Takings, in the Encyclopedia of Environmental Ethics and Philosophy. J. Baird Callicott and R. Frodeman, eds. Macmillan Reference.

Hale, B., 2008. Technology, the Environment, and the Moral Considerability of Artifacts, for a volume titled New Waves in Philosophy of Technology, ed. Evan Selinger, Jan Kyrre Berg Olsen, and Søren Riis. Ashgate Publishing.

Kenney, D., Klein, R., Goemans, C., Alvord, C., and Shapiro, J., 2008. The Impact of Earlier Spring Snowmelt on Water Rights and Administration: A Preliminary Overview of Issues and Circumstances in the Western States, Final Project Report (review draft): September 3.

Pielke, Jr., R.A., 2008. An Interview with John H. Marburger, Outgoing US President's Science Advisor. Bridges, Vol. 20, December.

Pielke, Jr., R.A., 2008. Europe's climate policy may be more about appearances. The Financial Times, December 24.

Pielke, Jr., R. A., 2008. Has Technology Assessment Kept Pace with Globalization? Bridges, Vol. 18, July.

Pielke, Jr., R. A., 2008. Political realities will undermine energy pricing, Letter to the Editor, Financial Times, July 21.

Pielke, Jr., R. A., 2008. The Rise and Fall of the Space Shuttle. Book Review: FINAL COUNTDOWN: NASA and the End of the Space Shuttle Program by Pat Duggins, American Scientist, Vol. 96, No. 5, p. 32.

Pielke, Jr., R. A., 2008. The Role of Risk Models in the Financial Crisis, Vol. 19, October.

Pielke, Jr., R.A., 2008. Science and Politics: Accepting a Dysfunctional Union. Harvard International Review, Summer, pp. 36-41.

Pielke, Jr., R. A. and C. Green, 2008. PIELKE and GREEN: The cure for carbon. Rocky Mountain News, November 22.

January 1 – June 30, 2009

Averill, M., 2009. Introduction: Resilience, Law, and Natural Resource Management. Nebraska Law Review 87:4, pp. 821-832.

Cherney, D.N., 2009. Wolves deserve a future. Letter to the Editor. Daily Camera. April 15, A15.

Cherney, D.N. and S.G. Clark. 2009. The American West's Longest Land Mammal Migration: Clarifying and securing the common interest. Policy Sciences 42(2):95-111.

Dessai, S., M. Hulme, R. Lempert, and R. Pielke, Jr. 2009. Do We Need Better Predictions to Adapt to a Changing Climate? Eos, Vol 90, No. 13, pp. 111-112.

Hale, B. and L. Hale, 2009. Choosing to Sleep. In The Philosophy of Public Health, ed. Angus Dawson. (Aldershot: Ashgate).

Hale, B., 2009. What's so Moral about the Moral Hazard? Public Affairs Quarterly. Vol 23, No 1. 1-26. Jan.

Komor, P., 2009. Solar Power: Clean electricity, but at what price? Harvard College Economics Review, Volume III, Issue 2, Spring.

Komor, P., 2009. Wind and Solar Electricity: Challenges and Opportunities. Pew Center on Global Climate Change, June.

Pielke, Jr., R.A., 2009. Ambiente, un´altra verità scomoda. Formiche, Vol. VI, No. 33. English version: The Carbon Dioxide Challenge, Simplified.

Pielke, Jr., R. A., 2009. An Idealized Assessment of the Economics of Air Capture of Carbon Dioxide in Mitigation Policy, Environmental Science & Policy, Vol. 12, Issue 3, pp. 216-225.

Pielke, Jr., R. A., 2009. Letters: The Nonscientist Science Adviser, Science, Vol. 323, No. 5917, p. 1010.

Pielke, Jr., R.A., 2009. Obama's Climate Policy: A Work in Progress. Bridges, Vol. 21, April.

Pielke, Jr., R. A. and R. Klein, 2009. The Rise and Fall of the Science Advisor to the President of the United States. Minerva, DOI 10.1007/s11024-009-9117-3, February 24.

D. Talks and Presentations

By Center Staff

Ila Cote, Risk Assessment at the Environmental Protection Agency: Science, Policy and Politics, CSTPR Noontime Seminar Series, Boulder, CO, February 18, 2009.

Lisa Dilling, Assembling the Policy Puzzle: How to Craft a Comprehensive National Energy and Climate Strategy, panel discussion, Boulder, CO, Aug. 23, 2008.

Lisa Dilling, Climate Change: What does it mean to the Denver region?, DRCOG, Denver, CO, November 19 and 20, 2008.

Lisa Dilling and Elisabeth Failey, Understanding Human Decision Making as a Driver for Carbon Sequestration on Land, AGU Fall Meeting, San Francisco, CA, December 15-19, 2008.

Lisa Dilling and Elisabeth Failey, Management of carbon across sectors and scales: Insights from land use decision making, AGU Fall Meeting, San Francisco, CA, December 15-19, 2008.

Lisa Dilling and Betsy Failey, Land use decision making as a driver of carbon sequestration at multiple scales: A Colorado case study, plenary talk, 2nd North American Carbon Program All-Investigators Meeting, San Diego, CA, February 17-20, 2009.

Lisa Dilling, The urgency of the climate change challenge: Is governance "getting in the way" of progress?, IARU International Scientific Congress on Climate Change, Copenhagen, Denmark, March 11, 2009.

Ben Hale, "Think!" Lecture on "Why You Don't Have to Love Nature to Be Green", Boulder, CO, November 18, 2008.

Ben Hale, "Can We Remediate Wrongs?" Philosophy Department. University of Colorado, Denver. December 3, 2008.

Ben Hale, "Getting the Bad Out," 3TEP Conference. Colorado School of Mines. April 20-21, 2009.

Ben Hale, "Getting the Bad Out: Remediation Technologies and Respect for Nature," Inland North Philosophy Conference, Invited Speaker. University of Idaho and Washington State University. May 1-3, 2009.

Roger Pielke, Jr., The Hazards Ahead, keynote address, 33rd Annual Hazards Research and Applications Workshop, Broomfield, Colorado, July 12-15, 2008.

Roger Pielke, Jr., Climate Change, Economics, & the Courts: A Program for Federal Judges, State Supreme Court Justices, & Law Professors. Bozeman, Montana, July 2008.

Roger Pielke, Jr., Disasters, Climate Change, and Demographics, Social Dimensions of Climate Change panel discussion, Boulder, CO, August 22, 2008.

Roger Pielke, Jr., Scientists in Highly Politicized Debates, Cornell University, October 23, 2008.

Roger Pielke, Jr., Can the British Climate Change Act Meet its Goals?, Birmingham, UK, February 10, 2009.

Roger Pielke, Jr., Uncomfortable Knowledge about Climate Policy, Oregon State University, Feb. 17, 2009.

Roger Pielke, Jr., The Business of Cap and Trade: Lessons from the European Experience, Vectra Bank Business for Breakfast, Denver, CO, April 22, 2009.

Roger Pielke, Jr., Climate Policy in the US and the UK, UK, April 30, 2009.

Melanie Roberts, Research Evaluation at the US National Science Foundation, University of Twente, Netherlands, March 17, 2009.

Melanie Roberts, Grant Writing 101: Tips for Success, Boulder, CO, April 9, 2009.

Melanie Roberts, Grant Writing 101: Tips for Success, Boulder, CO, April 29, 2009.

William Travis, The Ecological Impacts of Climate Change: An on the Ground Look at our Changing World, panel discussion, Boulder, CO, Aug. 23, 2008.

William Travis, Development: Urban Growth & Agricultural Resilience, Natural Resources Law Center's 30th Annual Summer Conference "Western Water Law, Policy and Management: Ripples, Currents, and New Channels for Inquiry". Boulder, CO, June 3, 2009.

William Travis, From Research to Field Testing and Deployment: Ethical Issues Raised By Geoengineering (panel discussion), Geoengineering Options to Respond to Climate Change: Steps to Establish a Research Agenda, Washington, DC, June 15, 2009.

By Center Students

Marilyn Averill. The Future Role of International Legal Frameworks. Three Degrees: The Law of Climate Change and Human Rights Conference. University of Washington School of Law. Seattle. (Panelist), May 27, 2009.

Marilyn Averill. Climate Ethics and Poverty. United

Nations Commission on Sustainable Development Annual Meeting. New York, May 5, 2009.

Marilyn Averill. Adaptation Ethics. United Nations Commission on Sustainable Development Annual Meeting. New York, May 2, 2009.

Marilyn Averill. Climate Ethics (Learning Centre presentation). United Nations Commission on Sustainable Development Annual Meeting. New York, May 1, 2009.

Marilyn Averill. Framing Natural Resource Management for Climate Resilience. IARU International Scientific Congress on Climate Change. Copenhagen, March 10, 2009.

Marilyn Averill. Adaptation: What happened in the Poznan, Poland Climate Negotiations? American Bar Association Quick Teleconference. (Panelist), March 5, 2009.

Marilyn Averill. The Complexities of International Climate Policy. American Meteorological Association Annual Meeting. Phoenix, January 12, 2009.

Marilyn Averill. Bringing the Ethics Debate Home. Side Session Panel on Moral and Ethical Issues that Must be Faced in Implementing the Bali Roadmap, United Nations Climate Conference. Poznan, December 9, 2008.

Marilyn Averill. Managing Climate Uncertainties. Gordon Research Conference on Science and Technology Policy. Big Sky. (Poster session), August 2008.

David Cherney, The American West's Longest Land Mammal Migration, Middletown Rotary Club, Newport, RI. July 2, 2008.

David Cherney, Integrative Conservation Problem Solving Workshop: Methods to Bridge the Natural and Social Sciences, Society for Conservation Biology 2008 Annual Meeting in Chattanooga, TN, July 13, 2008.

David Cherney, Non-governmental Organizations in Environmental Policy: An Overview of Greater Yellowstone, Boulder, CO, October 16, 2008.

David Cherney, Organizational Ecology in the Greater Yellowstone Ecosystem, Yale University, February 25, 2009.

David Cherney, Science Policy in Greater Yellowstone, Yale University, February 26, 2009.

David Cherney, Transforming Environmentalism: Perspectives on the Death of the Environmental Movement, Boulder, CO, March 6, 2009.

Mohleji, Shali. The Politics of Gulf Coast Restoration. Comments to The Aftermath of Hurricanes Katrina and Rita, ENVS Colloquium, Boulder, CO, April 20, 2009.

By Center Visitors

Frank Laird, Associate Professor of Technology and Public Policy, University of Denver, Changing Technological Systems: Comprehensive Policy for Renewable Energy, CSTPR Noontime Seminar Series, Boulder, CO, October 13, 2008.

Barbara Farhar, adjunct faculty member at the University of Colorado, research associate at CU Law School and at the Institute of Behavioral Science, On the Path to Zero Carbon Homes: The Comparative San Diego Case Study, CSTPR Noontime Seminar Series, Boulder, CO, October 20, 2008.

Jerry Peterson, physics professor at the University of Colorado and a Jefferson Science Fellow for the U.S. Department of State, A nuclear physicist in the Department of State, CSTPR Noontime Seminar Series, Boulder, CO, November 10, 2008.

Daniel M. Kammen, Distinguished Professor of Energy, University of California-Berkeley, Energy and Climate Opportunities for a Green New Deal, Energy Initiative Research Symposium, Boulder, CO, November 17, 2008.

Deane Little, Chairman and Chief Scientific Officer of New Sky, Profitable Air Capture of CO2, CSTPR Noontime Seminar Series, Boulder, CO, Jan. 28, 2009.

Nicole Peterson, Columbia University, Decisions, opportunities, and obstacles in organizational decision-making, Boulder, CO, February 20, 2009.

Nicole Peterson, Columbia University, Insuring the rain: Multidisciplinary collaboration in reducing climate risks for small-scale agriculturalists, Boulder, CO, February 20, 2009.

Melissa Kenney, Johns Hopkins University, Coupling Scientific Predictions with Decision Analysis: A New Method to Develop Nutrient Criteria, Boulder, CO, February 24, 2009.

Melissa Kenney, Johns Hopkins University, Using Decision Analysis to Address Complex Restoration Problems, Boulder, CO, February 24, 2009.

Dr. Konrad Steffen, Director for the Cooperative Institute for Research in Environmental Sciences (CIRES), Changes in the Arctic Ice Cover, CSTPR Noontime Seminar Series, Boulder, CO, Feb. 26, 2009.

Maxwell Boykoff, Environmental Change Institute, University of Oxford, The cultural politics of climate change: focusing on mass media, Boulder, CO, February 27, 2009.

Maxwell Boykoff, Environmental Change Institute, Transformations of carbon-based economies and societies: interrogating 'climate stabilization' aims, Boulder, CO, February 27, 2009.

Elizabeth Albright, Doctoral Candidate Nicholas School of the Environment, Duke University, Policy Change, Learning and Adaptation to Extreme Flood Events: The Central Danube River Basin, Boulder, CO, March 4, 2009.

Elizabeth Albright, Doctoral Candidate Nicholas School of the Environment, Duke University, Local-Level Response to Extreme Flood Events in the Central Danube River Basin: A Test of the Focusing Event and Advocacy Coalition Framework Literatures, Boulder, CO, March 4, 2009.

Jason Delborne, Assistant Professor of Liberal Arts and International Studies at the Colorado School of Mines, The Practice of Scientific Dissent in Agricultural Biotechnology, CSTPR Noontime Seminar Series, Boulder, CO, March 4, 2009.

Erik Fisher, Assistant Research Professor, Consortium for Science, Policy & Outcomes (CSPO), Department of Political Science, Arizona State University, The 'Two Cultures' in Science Policy Today, Boulder, CO, June 25, 2009.

Peter Hoppe, Head of Geo Risks Research Department, Munich Reinsurance Company, Munich, Germany, "The Munich Re Natural Catastrophes Data Base – Trends?", Boulder, CO, June 26, 2009.

Conferences, Workshops and Meetings

Benjamin Hale co-coordinated the Rocky Mountain Ethics Congress (RoME) at the University of Colorado, Boulder, August 8-10, 2008.

Roger Pielke, Jr., was the vice chair for the Gordon Research Conference on Governing Emerging Technologies, Big Sky, MT, August 17-22, 2008.

E. Media References

Marilyn Averill's presentation on Climate Ethics for the United Nations Commission on Sustainable Development Learning Centre was described in Outreach: A Daily Publication of Sustainable Development Issues Network (SDIN). May 4, 2009.

Marilyn Averill was interviewed for the Stakeholder Forum daily podcast from the United Nations Commission on Sustainable Development. May 4, 2009.

Lisa Dilling was quoted in a 19 February Daily Climate article on climate change adaptation and mitigation.

Lisa Dilling was quoted in a 1 December NY Times article on tracking carbon dioxide and greenhouse gases.

Bobbie Klein was cited in a 28 October CU News story about the Center receiving the Buff Energy Star Award in 2007-2008.

CSTPR Affiliate Paul Komor was quoted in a 3 February Fox Business story on Gore's Clean Energy Initiative.

CSTPR Affiliates Paul Komor and Brad Udall were interviewed by KGNU Radio on 27 August about energy and the Presidential election.

Myanna Lahsen was quoted in a 9 March Guardian article on climate change skeptics.

Roger Pielke, Jr. was quoted, cited, interviewed, or referred to in the following media:

- 30 June Investor's Business Daily on governmental report misusing research.
- 30 June Examiner article on global warming.
- 29 June Examiner article.
- 20 June Denver Post article on climate alarmists skepticism.
- 8 June New York Times blog on recent Obama climate report.
- 18 June environmentalresearchweb article on British Climate Change Act.
- 18 June Ottawa Citizen article on British Climate Change Act.
- 17 June Financial Post on GHF climate report.
- 17 June Energy Tribune article on Science of Disasters and Climate Change.
- 17 June Canada Free Press article on recent Obama climate report.
- 17 June Examiner article on recent Obama Climate Change report.
- 16 June Wall Street Journal on GHF climate report.
- 15 June opinion article for Financial Post on financial risk models.
- 11 June Wall Street Journal blog on Japan's new emissions-reductions targets.
- 6 June Wall Street Journal on GHF climate report.

- 4 June Scripps Howard News Service on GHF climate report.
- 4 June Financial Times on GHF climate report
- 1 June Washington Post blog on Global Humanitarian Forum (GHF) report.
- 1 June Nature blog on Global Humanitarian Forum's report
- 1 June New American article on recent Global Humanitarian Forum report.
- 30 May Salon on Global Humanitarian Forum's a climate change report.
- 28 May Register on the UK's climate act.
- 28 May European Commission on the costs of air capture.
- 29 April Nature on research on air capture.
- 29 April Denver Post on the cap-and-trade debate.
- 29 April Nature on research on air capture.
- 28 April New Scientist on science in the Obama administration.
- 24 April Wall Street Journal blog on the cap-and-trade debate.
- 21 April Wall Street Journal blog on environmental policy.
- 20 April NY Times on the cap-and-trade debate.
- 16 April Wall Street Journal blog on President Obama's climate policy.
- 13 April Washington Post blog on extreme events and climate change.
- 13 April Forbes on cap and trade programs.
- 17 March Wall Street Journal blog on climate policy.
- 16 March Energy Tribune.
- 15 March Philadelphia Inquirer on science and politics.
- 9 March Daily Camera article on Boulder's Kyoto goal.
- 27 February NY Times blog on his book The Honest Broker.
- 27 February Wall Street Journal blog on cap-and-trade provisions.
- 26 February Hawaii Reporter on recent op-ed by Gore and Ki-Moon.
- 26 February Charleston Daily on Al Gore's recent climate assertions.
- 23 February NY Times blog on Al Gore's recent climate presentation.
- 23 February NY Times article on his book The Honest Broker.
- 23 February NY Times blog on his book The Honest Broker.
- 20 February Carbon Capture Journal on atmospheric carbon capture.
- 17 February Wall Street Journal blog on Environmental Capital.
- 11 February BBC News on the UK's CO2 plan.
- 8 February Times Online on melting ice caps study.
- 5 February Nature blog on air capture.
- 20 January Daily Camera on President Obama and the scientific community.
- 12 January UK's Register on disaster losses and insurance rates.
- 2 January Science magazine on the role of the presidential science adviser.
- 31 December Rocky Mountain News on carbon taxes and fossil fuels.
- 26 December Rocky Mtn News on Obama's newly appointed science adviser.
- 21 December Christian Science Monitor on Obama's new administration.
- 19 December New Scientist on John Holdren, Obama's new science adviser.
- 18 December Houston Chronicle on insurance rates and hurricanes.
- 19 December NY Times on Obama's newly appointed science adviser.
- 18 December Washington Post on Lautenbacher joining AccuWeather.
- 4 December Boulder Weekly on journalism in America.
- 25 November Dutch "Natuurwetenschap & Techniek" on risk models and the financial crisis.
- 22 November Rocky Mountain News on the Obama plan for climate policy.
- September "Économie" on IPCC scenarios.
- 25 September CU News on $1 million grant for Consortium for Capacity Building.
- 25 September Daily Camera on Clinton Global Initiative help with the CCB.
- 25 September New York Times on Center for Capacity Building's move to CU.
- 25 September NY Times Dot Earth blog on new funding for Center for Capacity Building.
- 23 September Austin American-Statesman on hurricanes and coastal construction.
- 20 September Sydney Morning Herald on the Pielke et al. Nature article.
- 3 September Time Magazine on natural disasters occurrences and intensity.
- 3 September NPR broadcast on cyclones and global warming.
- 24 August Casper Star Tribune on NCAR layoffs and Cheyenne supercomputer.
- 18 August Daily Camera on NCAR budget cuts.
- 12 August Christian Science Monitor on climate and presidential campaigns.
- 9 August Boston Globe on the societal impact of global warming.
- 7 August New York Times Dot Earth blog on closing of NCAR's climate lab.
- 7 August Daily Camera on the closing of NCAR's climate impacts center.
- 6 August New York Times on the closing of the Center for Capacity Building
- 4 August Albuquerque Journal on emission caps.
- 29 July New York Times on climate science and the media.
- 10 July Colorado Daily on Natural Hazards workshop at CU.
- 1 July CU News on Hazards Research and Applications Workshop.

Research, education, and outreach at the interface of science, technology, and the needs of decision makers

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