Ogmius

NEWSLETTER OF THE CENTER FOR SCIENCE AND TECHNOLOGY POLICY RESEARCH

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CENTER FOR SCIENCE AND TECHNOLOGY POLICY RESEARCH
COOPERATIVE INSTITUTE FOR RESEARCH IN ENVIRONMENTAL SCIENCES
UNIVERSITY OF COLORADO AT BOULDER

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Inside this issue:

Introduction

In this month's Ogmius we engage recent attention to the "politicization of science," and ask about the motivations for such attention. We encourage you to share your reactions to our lead editorial, which we will collect and publish in a future issue. We also have from Suraje Dessai (School of Environmental Sciences, University of East Anglia, UK and Tyndall Centre for Climate Change Research, UK) a reply to Clark and Pulwarty's comment, Devising Resilient Responses to Potential Climate Change Impacts, which appeared in our May 2003 issue (http://sciencepolicy.colorado.edu/ogmius/archives/issue_5/exchange1.html). And you will also find a compilation of news and activities related to our work here at the CIRES Policy Center. Be sure to note that we have a new graduate program in Science and Technology Policy (see page 5) here at the University of Colorado and a new research position in weather forecast use and value open here at the Center (see page 8). Thanks for reading!

Roger Pielke, Jr., Editor
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Ogmius Editorial
Good for the Goose...

It has become fashionable for combatants engaged in political debate on topics such as global warming, genetically modified organisms, and stem cell research to highlight the negative consequences for both science and policy making of politicizing science.

For example, in the United States Representative Henry Waxman (D-CA) recently issued a report alleging that the administration of George Bush systematically abuses science in support of its ideological agenda. And the Hoover Institution published a book – *Politicizing Science* – which disparages the alleged misuse of science in support of environmental regulation.

Making sense of these sorts of accusations is difficult because the accusers are typically far from disinterested observers. Mr. Waxman is engaged in political battle with the Bush administration and many of the authors of essays in the Hoover book are long-time opponents of environmental regulations, as is the Hoover Institution in general.

"Junk science," it seems, is merely that science which your political opponents use to support their position. It is ironic that expressions of concern about the politicization of science have become another way for ideologues to advance their particular agendas. In other words, we are witnessing the politicizing of the politicization of science.

But before dismissing these claims, it should be noted that people from diverse ideological perspectives agree that the relationship of science and policy is

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increasingly threatened by the politicization of science – and the consequences are serious.

For example, when a recent paper in the journal *Climate Research* argued that 20th century climate variations were unexceptional from a millennial perspective, it was no surprise that advocacy groups opposed to the Kyoto Protocol hailed the research as "sound science," while advocacy groups in support of Kyoto called it "junk science." More troubling is that within the scientific community itself, how individual members of the scientific community have evaluated the *scientific merit* of this paper correlates perfectly with their public expressions of support or opposition to the Kyoto Protocol. "Scientific" discussion among academics largely devolved into bitter ad hominem attacks. From the perspective of the public or policy makers, the scientific debate and political debate on climate change have become indistinguishable. As a result, rather than contributing to the development of creative and feasible policy options, climate science has become little more than a mechanism of marketing competing political agendas.

If the public or policy makers begin to believe that scientific findings are simply an extension of a scientist's political beliefs, then scientific information will play an increasingly diminished role in policy. This will be tragic because scientific information often (but not always) matters for policy making.

In all but the most trivial of cases science cannot dictate specific policy outcomes. Rather scientific understandings are frequently either intrinsically uncertain or diverse enough to be used to justify a range of competing political agendas. In such situations the standard response is to call for more scientific research ("sound" or "objective" of course) in hopes that uncertainties will shrink or a political consensus will emerge.

In reality, new research frequently increases uncertainties and simultaneously provides a steady replenishment of scientific ammunition for all sides engaged in political conflict. Rather than political consensus, what emerges is typically gridlock. We have, in the words of Daniel Sarewitz, an "excess of objectivity."

One way out of this predicament is to recognize that in situations of gridlock policy makers need new options, not more science. This lesson has been missed from the successful response to stratospheric ozone depletion. After scientists discovered in the early 1970s that human-produced chlorofluorocarbons (CFCs) could harm the ozone layer, it was not scientific information that led to political consensus. Introduction in the mid-1970s of creative policy options that distinguished essential from non-essential uses of CFCs both depoliticized the issue and stimulated the search for chemical substitutes, even as ozone science remained uncertain. In this case, scientific consensus about policy options followed political consensus.

Expanding the options available to policy makers is contrary to the approach most advocates and scientists have taken in the policy process. Political advocacy is all about reducing the scope of choices, often to a single preferred vision. And the many scientists who eschew advocacy typically seek to provide information and stay far removed from any explicit discussion of policy options. For instance, the Intergovernmental Panel on Climate Change, which was formed to provide guidance to policy makers, by design, does not discuss policy options.

For the protection of science and the constructive role that it can play in policy, we desperately need organizations and individuals who are willing to expand the range of options available to policy makers. And usually there are many options consistent with sometimes internally conflicting and uncertain scientific understandings. This was once the approach of the U.S. government's Office of Technology Assessment, but Congress, in its questionable wisdom, terminated the agency in 1995. More organizations and individuals working from this perspective would provide a clear alternative to those from across the political spectrum who seek to politicize science in support of their narrow interests.

Politicization of science is a problem, irrespective of the ideology of those doing the politicizing. Our scientific enterprise is too important to allow putative concerns about the politicization of science to become just another weapon in partisan battle.

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Politicization of Science: Some Recent Publications

Concern about the politicization of science comes from across the political spectrum, as these various examples illustrate. But it is fair to question whether the concern for science is genuine, or merely another means for attacking political opponents. You be the judge.

- Agres, T., 2003: Science, Policy and Partisan Politics. The Scientist. http://www.biomedcentral.com/news/20030813/04
- The Battle for American Science, The Guardian, April 10, 2003. http://www.guardian.co.uk/life/feature/story/0,13026,933055,00.html

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- Brown, G.E., 1996: Environmental Science Under Seige, House Science Committee http://www.house.gov/science_democrats/archive/envrpt96.htm
- Furchtgott-Roth, D., 1999: The Pitfalls of Politicizing Science. American Enterprise Institute for Public Policy Research. http://www.aei.org/news/newsID.9872/news_detail.asp
- Herrick, C. N. and D. Jamieson, 2000: Junk Science and Environmental Policy: Obscuring Public Debate with Misleading Discourse, Philosophy and Public Policy Quarterly, Vol. 21, Spring:11-16. http://www.puaf.umd.edu/IPPP/reports/Spring-Summer%20Vol21%202001/221056.pdf
- Hoover Institute – Politicizing Science: The Alchemy of Policymaking http://www-hoover.stanford.edu/publications/books/polscience.html
- JunkScience.com http://www.junkscience.com
- Kennedy, D., 2003: An Epidemic of Politics, Science 299: 625
- Mooney, C., 2003: The Science Gap. Boston Globe. http://www.boston.com/news/globe/ideas/articles/2003/10/05/the_science_gap/
- Murray, I., 2003: Environmental Scientists Must Stop Crying Wolf. Financial Times. http://www.cei.org/gencon/019,03668.cfm
- Pielke, Jr., R. A., 2002: Policy, politics and perspective. Nature 416:368. http://sciencepolicy.colorado.edu/homepages/roger_pielke/hp_roger/pdf/2002.05.pdf
- Pielke, Jr., R.A., 2003: Another Epidemic of Politics? Letter to the Editor, Science, Vol. 300, no. 5622, pp. 1092-1093. http://sciencepolicy.colorado.edu/homepages/roger_pielke/hp_roger/pdf/2003.18.pdf
- Pielke, Jr., R. A., 2003: Politics and science mix badly. International Herald Tribune, January 20. http://www.iht.com/articles/83847.html
- Politics and Science: Investigating the Bush Administration's Promotion of Ideology Over Science (Waxman Report) http://www.house.gov/reform/min/politicsandscience/
- Rubin, C.T., 1997: The Troubled Relationship Between Science and Policy. The Marshall Institute. http://marshall.pjdoland.com/article.php/19.html
- SEPP Misuse of Science Page http://www.sepp.org/misuse/misuse.html

Ogmius Exchange Letter

Response to Clark and Pulwarty's "Devising Resilient Responses to Potential Climate Change Impacts"

This letter has been triggered by the very timely and most welcome Ogmius Exchange on "decision-making and climate change". This topic is not only important for research and policy, but to the forthcoming Fourth Assessment Report of the IPCC as well as the strategic planning of the US Climate Change Science Program (CCSP). In this short letter, I argue that there is considerable scope to link probabilities of climate change with climate adaptation decision-making.

In their leading article, Clark and Pulwarty (C&P) give three reasons to scrap probabilities. First, C&P argue that climate models do not estimate the entire range of plausible futures so an approach focused on bounding the scope of the possible futures would be desirable. This is exactly at the core of much of the Bayesian work on constraining climate (and other) parameters (e.g., Forest et al., 2002). Estimating the entire range of plausible futures is practically impossible because of a number of other unquantifiable uncertainties of model prediction (see Dessai and Hulme, 2003) such as the second (ignorance) and third (anticipating human activity) points raised by C&P. However, ignorance of climate feedbacks, land use

Ogmius Exchange Letter Continued

effects on climate or climate downscaling can benefit from further research, particularly with respect to the representation of uncertainties. Distinguishing between what is known and what is unknown is very useful to the process of focusing research. Though C&P have argued that predicting population growth and other determinants of greenhouse gas emissions is "essentially impossible", various groups have attempted this (e.g., Lutz et al., 2001; Webster et al., 2002). C&P overlooked to mention that because humans are reflexive, representing uncertainty in terms of probabilities in the context of prediction is impossible. Probabilities will always remain "provisional" hence the need to combine scenario and uncertainty analysis (Dessai and Hulme, 2003).

C&P raise another three issues that need debating. First is the fact that probabilities are not the only way to represent climate change uncertainties. Various other techniques such as specific language or Dempster-Shafer theory are available to represent uncertainty. C&P argue that "probabilistic climate projections can mislead decision-makers", but this is not the case unless the communication of uncertainty by the researchers is not done appropriately; in any case, probabilities will always remain conditional upon the assumptions taken by the researchers. Finally, Lempert and Schlesinger's (2000) argument, which C&P support, that policies should be robust, i.e., as flexible as possible, is problematic in a financially constrained world. This is exactly where probabilities can help investments by considering the state-of-the-art knowledge, even if "conditional" and "provisional". What we need to start researching is how sensitive climate adaptation decisions are to climate change (and other) uncertainties using, for example, a combination of probabilities and scenario analysis. Robust policies will be the ones that are scenario independent.

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and Tyndall Centre for Climate Change Research, UK

References cited:

Dessai, S. and M. Hulme (2003). "Does climate policy need probabilities?" Tyndall Centre Working Paper (No. 34.): Available at: http://www.tyndall.ac.uk.

Forest, C. E., P. H. Stone, A. P. Sokolov, M. R. Allen and M. D. Webster (2002). "Quantifying uncertainties in climate system properties with the use of recent climate observations." *Science* 295(5552): 113-117.

Lempert, R. J. and M. E. Schlesinger (2000). "Robust strategies for abating climate change." *Climatic Change* 45(3-4): 387-401.

Lutz, W., W. Sanderson and S. Scherbov (2001). "The end of world population growth." *Nature* 412(6846): 543-545.

Webster, M. D., M. Babiker, M. Mayer, J. M. Reilly, J. Harnisch, R. Hyman, M. C. Sarofim and C. Wang (2002). "Uncertainty in emissions projections for climate models." *Atmospheric Environment* 36(22): 3659-3670.

Center News

Science Policy Assessment and Research on Climate Proposal

The Center spearheaded preparation of a grant proposal under the National Science Foundation's Decision Making Under Uncertainty program. The proposal recognizes that society's strategy for responding to and preparing for climate change in the face of ongoing uncertainty hinges upon the relationship between science policy decisions and climate policy decisions, a relationship that has never been systematically examined. The proposed project— Science Policy Assessment and Research on Climate (SPARC)—will help fill this gap through a focus on four interconnected areas of science policy decision making where uncertainty strongly influences how knowledge is made available to society for responding to climate change, namely:

1) how climate research agendas are developed and implemented (Project on Reconciling Supply and Demand)
2) how specific issues are prioritized given the multiple causes of global environmental change (Project on Sensitivity Analyses)
3) how model output uncertainties are interpreted (Project on Model Characterization)
4) how the framing of science and policy priorities in the face of uncertainty is influenced by human values (Project on Values and Uncertainty).

The 5-year, $7 million proposal involves 16 researchers from the University of Colorado, Colorado School of Mines, Colorado State University, University of Denver, National Center for Atmospheric Research, American Meteorological Society, and University of California-San Diego.

Center News

University of Colorado to Offer Graduate Certificate in Science and Technology Policy

In recognition of society's growing need for persons with expertise at the intersection of science, technology, and decision making policy, the University of Colorado at Boulder recently approved a new Graduate Certificate in Science and Technology Policy, which will be coordinated by the CIRES Center for Science and Technology Policy Research. A parallel certificate is being offered at the Colorado School of Mines, and students will have an opportunity to take classes at both campuses.

The program is currently soliciting applications for its first cohort of students. The application deadline is Friday, November 14, and a decision on acceptance will be made by Friday, December 19. All University of Colorado-Boulder graduate students are eligible to apply.

University of Colorado faculty members participating in the program are from a variety of departments, institutes and programs, including Geography, Civil and Mechanical Engineering, Environmental Studies, Law, Health Sciences, CIRES, INSTAAR, Interdisciplinary Telecommunications, Computer Science, and Journalism.

The certificate program, which will enroll its first cohort of students for the spring 2004 semester, will require completion of 18 hours of approved coursework including three proposed new courses ("Science and Technology Policy", "Science, Technology and Society", and "Methods of Policy Analysis and Research") as well as three additional courses from a list of approved electives.

For more information about the program and application process please see the certificate program website at http://sciencepolicy.colorado.edu/stcert/ or contact Roger Pielke at pielke@colorado.edu or Carl Mitcham at mitcham@mines.edu.

Center News

Center's Newly Designed Website Now Online

The Center's website underwent a facelift last June. Our webmaster, Mark Lohaus, redesigned the site to make it cleaner, more attractive, and easier to navigate. The home page now features an up-to-date listing of upcoming events, announcements, highlighted publications, and recent media references to the Center. Visitors can quickly access the Center's most popular projects, including current and past issues of Ogmius, through a list of "quick clicks" on the right side of the home page. The site continues to provide information about the Center, a complete list of Center publications, and resources for the media. Please visit the site at http://sciencepolicy.colorado.edu/.

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Center News
Center's 2002-03 Annual Report Now Available

The 2002-03 Annual Report for the Center is now available online at http://sciencepolicy.colorado.edu/center_info/archives/annual_report_02-03.pdf. For a hard copy please contact ami@cires.colorado.edu. The report summarizes activities and developments at the Center over the last year which include a symposium on science technology, and security, a study of the effectiveness of municipal water restrictions during the 2002 drought, publication of Bob Frodeman's book Geo-Logic, approval of a graduate certificate program in science and technology policy, receipt of an NSF grant to study competing scientific understandings of the Amazon's role in the global climate cycle, initiation of several internship programs, and the addition of staff. The report also includes a complete list of 2002-03 publications and talks by Center staff.

Center News
Natural Resource Law Center's 24th Annual Water Law Conference

The Western Water Assessment cosponsored the Natural Resource Law Center's 24th annual water law conference entitled "Water, Climate and Uncertainty: Implications for Western Water Law, Policy, and Management" on June 11-13, 2003 in Boulder. The conference brought together over 150 scientists, water managers, policy makers, and attorneys to discuss the connections between science, policy, and law in the context of global climate change. Three of the Center's staff members participated. Martyn Clark moderated a panel that addressed the question how seriously to take climate models, projections, and probabilities. Bobbie Klein presented a poster summarizing her project with Doug Kenney, "Use and Effectiveness of Municipal Water Restrictions During Drought in Colorado." Roger Pielke participated in a panel discussion that attempted to tie the conference's themes together.

Center News
GCCS Summer Speaker Series

The Global Climate Change and Society (GCCS) 2003 session brought three distinguished speakers to Boulder to address various aspects of global climate change:

- Professor John Robinson of the Sustainable Development Research Initiative and Department of Geography at the University of British Columbia spoke about the relationship between climate science and sustainability on July 14 and 15.
- Professor Bruce Foltz of Eckerd College's philosophy department addressed the philosophical and theological dimensions of global climate change on July 21 and 22.
- Vicki Arroyo, Director of Policy Analysis for the Pew Center on Global Climate Change spoke about the environmental impacts of climate change, economics, and domestic policy issues on July 28 and 29.

Center News
New Directions Conference at Penn State University

The New Directions in the Earth Sciences and the Humanities and Real World Experiments Programs sponsored a conference at Penn State University October 9-11, entitled "New Directions in Interdisciplinary Research: A Conference in Real World Experiments." The conference sought to further goals shared by ND and RWE: develop tools for the planning and implementation of scientifically reliable and socially robust approaches of environmental design; identify the specific contribution of the humanities to environmental solutions; and make scientific information more pertinent to society.

The outcomes achieved include: improving the usefulness of public science; providing new venues for citizen and stakeholder participation in environmental decision making; gaining insight into the nature of interdisciplinary research and dialogue; and expressing the human dimensions of our relationship with the environment.

Center News
Visiting Fellows at CIRES - Applicants Wanted!!

The Cooperative Institute for Research in Environmental Sciences (CIRES) under the sponsorship of the National Oceanic and Atmospheric Administration is offering up to six one-year Visiting Fellowships at the University of Colorado in Boulder.

This is open to scientists with research interests in the areas of the new CIRES Research Themes (http://cires.colorado.edu/themes) and includes science and technology policy research.

Awards may be made to Ph.D. scientists at all levels and faculty planning sabbatical leave. Recent Ph.D. recipients and those affiliated with minority institutions are especially encouraged to apply. Selections for this Visiting Fellows Program are based in part on the likelihood of interactions between the Visiting Fellows and the scientists at CIRES and the degree to which both parties will benefit from the exchange of new ideas. To further this goal, priority is given to candidates with research experience at institutions outside the Boulder scientific community.

The program is open to scientists of all countries, and appointments can begin at any time during the year. Salary is commensurate with qualifications, current salary and cost of living considerations. The Fellow will be eligible for benefits, office space, telephone and computer facilities, and a small moving and start-up allowance.

Visiting Fellowships are potentially renewable for a second year, provided supplemental funding is available.

For more information http://cires.colorado.edu/visfell/vf.html.

Center News
Report on Center Graduate Research Assistants Internships

This past summer two of the Center's Graduate Research Assistants interned in fields related to science and technology policy.

Genevieve Maricle, a Graduate Research Assistant for the Center and Western Water Assessment, interned with the House Science Committee staff (http://www.house.gov/science/). The House Science Committee drafts and approves legislation that establishes policy for certain areas of science including climate change. Genevieve studied the decision making processes of the committee to determine what information the research community could provide that would facilitate those processes. She also contributed to specific legislation relating to climate change policy such as identifying the needs of users of climate change science.

Jessica Lang, another Graduate Research Assistant for the Center and Western Water Assessment, interned with the City of Westminster water utility department (http://www.ci.westminster.co.us/gov/depts/pwu/water.htm). Jessica studied how municipal water managers make decisions about water supply and demand in order to identify how climate information could be useful to water managers, and assisted water managers in developing strategies for decision making in the absence of scientific certainty.

Center Publications

Roger Pielke addressed the ongoing debate over whether government should provide weather products and services for the broader public good or those in the private sector should be allowed to sell them in the marketplace in "The Great American Weather War," Natural Hazards Observer Volume XXVII, July 2003 (http://www.colorado.edu/hazards/o/julyo03/julyo03a.htm). Pielke concludes, "There is no magic bullet solution to issues arising over the provision of weather and climate services. Instead, progress will necessarily come from the exercise of leadership and community consensus. The NRC [National Research Council] and AMS [American Meteorological Society] have taken important steps in this direction."

Best practices in prediction for decision making by Roger Pielke and Richard Conant is also now available. Pielke, Jr., R. A. and R. T. Conant, 2003: Best practices in prediction for decision making: lessons from the atmospheric and Earth sciences, Ecology, 84:1351-1358 (http://sciencepolicy.colorado.edu/homepages/roger_pielke/hp_roger/pdf/2003_22.pdf).

Bobbie Klein also has a publication just released. Klein, R., 2003: Someone to Blame: Legal Liability for Weather Forecasts. Weatherwise Magazine, September/October (http://www.weather-wise.org/default.htm).

Science and Technology News
Conference

A conference titled "The Digital Broadband Migration: Toward A Regulatory Regime For The Internet Age" will be held on February 8-9, 2004 at the University of Colorado School of Law, Boulder, Colorado.

For more information see the website at http://www.silicon-flatirons.org. Registration and payment may be made in advance with a check payable to the "University of Colorado" and sent to:

University of Colorado School of Law
Silicon Flatirons Telecom Program
UCB 401
Boulder, CO 80309

For Further Information, call (303) 735-5633 or email Kley Achterhof at kley.achterhof@colorado.edu.

Science and Technology News
CSPO News Update

The Washington, DC, office of the Center for Science, Policy, and Outcomes is closing. For the immediate future, the Center will continue to operate as a virtual network of scholars and projects, and the CSPO web site (http://www.cspo.org) will continue to be a portal to our ideas and products. New and very interesting institutional alliances are in the works, and news about future directions and opportunities should be available in the next few months.

Meanwhile, Living with the Genie: Essays on Technology and The Quest for Human Mastery has just been published by Island Press. This collection includes essays by Alan Lightman, Richard Rhodes, Lori Andrews, Richard Powers, Philip Kitcher, and many more. For more information about the book, and to order a copy, go to:

http://www.islandpress.org/books/detail.html?cart=1066247767125523&SKU=1-55963-419-7.

Job Opportunities
Postdoctoral Position Focused on Impacts of Improved Forecasting of Energy Load and Precipitation

The Cooperative Institute for Research in Environmental Sciences (CIRES) is seeking a research scientist to conduct research on the use and value of forecasts at the Center for Science and Technology Policy Research (CSTPR) at the University of Colorado/CIRES and the NOAA Environmental Technology Laboratory (NOAA/ETL). There are two research foci for this position. First is to study the use and value of load forecasts for the energy sector based on surface temperature forecasting in New England, and second is to study water management information needs in the Western U.S. in the context of the relationship of flood control and water supply and hydrometeorological forecasting. The focus on forecasts includes evaluations based on existing forecast accuracy, as well as on potential improvements in accuracy. Regional spatial scales and short forecast lead times (0-48 h) will be emphasized.

Duties

- Develop understanding of how weather forecasting information is used in (1) load forecasting for the New England energy sector, and (2) various aspects of water supply, flood control, and endangered species management associated with Western U.S. water.
- Identify opportunities for and obstacles to the use of improved regional, short-term temperature and precipitation forecasts, including the use of probabilistic information.
- Quantify the value of regional, short-term surface temperature and precipitation forecasts, including quantitative estimates of uncertainty in the valuations.
- Meet regularly with the various users of weather information in the New England energy sector and in the Western water management community.
- Help design and carry out proof-of-concept demonstrations that show the link between forecasts, technology, public and private weather services and user decisions as part of a testbed approach.
- Provide feedback to NOAA on energy sector and water manager needs for improvements in NOAA's services.

Requirements

- A Ph.D. in a relevant physical or social science.

Job Opportunities Continued

- Knowledge and experience with data collection and analysis techniques in the context of research on decision making.
- Experience with statistical techniques.
- Ability to communicate effectively with both the users and providers of weather forecasts as well as with those who conduct atmospheric research.
- Ability to present results at technical meetings and to publish in peer-reviewed literature.

For further information, please contact Dr. Roger Pielke Jr. (pielke@cires.colorado.edu) or Dr. F. Marty Ralph (marty.ralph@noaa.gov).

To apply, please send your resume, salary history, and a list of three references by e-mail (jobs@cires.colorado.edu), fax (303-492-1149), or regular mail:

Human Resources: CIRES, 216 UCB, University of Colorado, Boulder, CO 80309-0216.

Job Opportunities
Climate Science and Impacts Staff Scientist

The Union of Concerned Scientists seeks an individual to serve as climate change staff scientist and member of the Sound Science Initiative project team.

Responsibilities:

- Provide substantive guidance of UCS work to assess and publicize the ecological and societal impacts of climate change in specific regions of the United States.
- Design and guide collaborative analyses of the projected impacts of climate change on key sectors (agriculture, water resources, tourism, coasts, etc.).
- Lead production of report(s) and participate in the design and implementation of outreach and media strategies.
- Help craft project grant proposals and reports and manage relevant budgets. Initial focus will be on California with likely expansion to climate impacts activities in other regions of the United States.
- Identify, develop, and implement activities to strengthen public and policymaker understanding of climate change, the effectiveness of key climate science institutions, and the sound representation of climate change science and impacts in the media, including activities to support the work of the Intergovernmental Panel on Climate Change.
- Maintain strong working relationships with prominent scientists in climate-related fields and engage members of the scientific community in UCS activities.
- Provide technical review of scientific and policy aspects of UCS climate change materials. Tailor the style and content of materials for technical and/or general audiences as appropriate.
- Serve as media spokesperson on climate science and impacts issues.
- Maintain knowledge of developments and trends on key aspects of climate and global change science and help determine appropriate UCS activities.
- Maintain awareness of role as UCS representative and perform other related functions as directed.

Qualifications: This position requires in-depth knowledge of climate change science, including the ecological and/or societal impacts of climate change, generally acquired through completion of a doctoral program in a relevant field. This position also requires demonstrable skills in project management, as well as an ability to understand the public policy aspects of climate change and the role of technical analyses and advocacy in shaping public opinion and policy debates. This position also requires strong public speaking skills, a demonstrable ability to write for general audiences, and the ability to work independently and as a member of a multidisciplinary team.

Experience: At least two years of progressively responsible related professional experience is required, including experience in communicating science to non-specialists and in developing and guiding collaborative projects. Supervisory experience is highly desirable. Up to one year of on-the-job training may be necessary to become familiar with UCS organization, philosophy, programs, and constituencies.

Position details: This position will be based in UCS's Cambridge office. Some travel will be required. Salary commensurate with training and experience. Excellent benefits and rewarding working environment. UCS is an equal opportunity employer that continually seeks to diversify its staff.

To apply: Please send cover letter, vita, writing sample, and names of three references to:

Deputy Director
Global Environment Union of Concerned Scientists
Two Brattle Square
Cambridge, MA 02238
Email: ncole@ucsusa.org

Job Opportunities
Post-Doctoral Position in Atmospheric or Oceanic Sciences

BBSR seeks outstanding candidates for a unique post-doctoral position that allows the scientist to combine their research interests with activities that enhance interactions between the scientific and business communities. The successful applicant's time will be divided between their own research, which will be undertaken independently or in collaboration with other scientists at BBSR, and activities associated with the Risk Prediction Initiative. Applicants should enjoy the challenge of making a wide range of science understandable and relevant to nonscientists. We encourage candidates from a broad range of backgrounds to apply. The position is for one year with renewals contingent upon satisfactory progress.

Scientists at Bermuda Biological Station for Research, Inc. (BBSR) study a wide variety of atmospheric and oceanographic processes and support atmospheric and oceanographic time series stations. The BBSR is a US incorporated 501(c)(3) 'not-for-profit' marine research and education institution incorporated in New York State and based in Bermuda since 1903. Additional information on BBSR can be found at http://www.bbsr.edu.

The Risk Prediction Initiative (RPI) is a unique science-business partnership based at BBSR and sponsored by a group of insurance and reinsurance companies. The RPI funds research on extreme events of interest to the catastrophe reinsurance industry (e.g., tropical cyclone landfall, European wind storms, and earthquakes) and promotes communication between the business and science communities through products such as workshops and publications. Additional information can be found at http://www.bbsr.edu/rpi/.

For further information please contact Gillian Hollis (tel: 441-297-1880 ext. 237; email: gillian@bbsr.edu).

Applicants should send a C.V., contact information for three references, and a description of their research interests to:

Dr. Anthony Knap, Director
The Bermuda Biological Station for Research, Inc.
17 Biological Lane
St. George's, GE01 BERMUDA

BBSR is an equal opportunity employer and operates a drug-free workplace and learning environment.

Job Opportunities
Project Scientist III - NCAR

This is a new, full-time position with the Research Applications Program (RAP) and Environmental and Societal Impacts Group (ESIG) at the National Center for Atmospheric Research. The position provides leadership in establishing a program at NCAR on the societal impacts and benefits of improved weather information. Through a process emphasizing extensive collaborative dialogue and community building, he or she will identify, coordinate, cross fertilize and actively engage researchers and organizations that conduct research related to understanding the societal impacts and benefits of weather information. He or she will establish, manage and coordinate research efforts within and across participating organizations within and outside NCAR.

Duties Include:

- Establishes, leads, and manages collaborative program, coordinates research efforts within and across participating organizations, and works closely with sponsor(s) to ensure the successful completion of tasks.
- Actively manages, mentors and develops team members and other staff.
- Actively engages researchers and organizations conducting societal impact related research to facilitate information transfer to the community.
- Coordinates, synthesizes and organizes relevant data and information and ensures that the results are made accessible in a timely manner to the research community and policy makers.
- Represents the societal impacts aspects of weather research programs and activities at U.S. and international fora (e.g., conferences, working groups, task forces, etc.).
- Ensures that societal impact analyses are considered in the planning of national and international weather-related research programs (e.g., THORPEX).
- Pursues appropriate funding sources.
- Responsible for identifying funding opportunities and

Job Opportunities Continued

managing the proposal process.

- Writes and/or coordinates proposal submission.
- Writes peer-reviewed journal articles, technical reports, conference papers.
- Makes presentations at meetings and conferences.

Requirements, Education and Experience Include:

- Ph.D. in a social science or atmospheric science; plus
- at least 7 years' of progressively responsible, relevant research and program development experience;
- or an equivalent combination of education and experience.

Knowledge, Skills and Abilities:

- Demonstrated skill in leading and managing complex, multi-year scientific/technical programs.
- Experience in leading and managing a diverse staff.
- Demonstrated skill in developing employees.
- Demonstrated understanding of the utility of weather information to the needs of various economic sectors and the ability to design and develop new research programs to explore and address them.
- Demonstrated skill in working effectively with the societal impacts research community.
- Demonstrated ability to work in a schedule-driven environment and produce high-quality deliverables on time.
- Demonstrated skill in representing the program to a diverse group of agency sponsors, other research laboratories, and potential sponsors and collaborators.
- Demonstrated knowledge of operational and research practices within the atmospheric sciences community.
- Skill in conceiving, developing, and writing new proposals for outside funding.
- Excellent oral and written communication skills.
- Willingness and ability to travel frequently.

Online: Apply through WebHire at:

http://resumebuilder.webhire.com/resume_add.asp?company=ucar.ncar

Standard Mail:

Send your paper resume to:
UCAR Human Resources
3065 Center Green Drive
Boulder, Colorado 80301

Initial consideration will be given to applications received prior to Friday, October 24, 2003. Thereafter, applications will be reviewed on an as-needed basis. For more information see http://www.fin.ucar.edu/hr/careers/uco.cfm?do=jobDetailExt&job_ID=127.

Internship Opportunities

Christine Mirzayan Science and Technology Policy Internship Program of the National Academies, Washington, D.C.

This Internship Program of the National Academies--consisting of the National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council--is designed to engage graduate and postdoctoral students in science and technology policy and to familiarize them with the interactions among science, technology, and government. As a result, students in the fields of science, engineering, medicine, veterinary medicine, business, and law develop essential skills different from those attained in academia, which will help them make the transition from being a graduate student to a professional.

Applications are now being accepted for the 2004 program. This year, the internship program will comprise three sessions:

- Winter: January 12 through April 2 (12 weeks with a possible 4 week extension).
- Summer: June 1 through August 6 (10 weeks).
- Fall: September 7 through November 24 (12 weeks).

To apply, candidates should submit an application and request their mentor fill out a reference form. Both are available on the Web at http://national-academies.org/internship.

The deadline for applications is November 1 for the Winter program, March 1 for the Summer program, and June 1 for the Fall program. Candidates may apply to all three programs simultaneously.

Additional details about the program and how to join the mailing list are also available on the Web site. Questions should be directed to: internship@nas.edu.

THE NATIONAL ACADEMIES
Advisers to the Nation on Science, Engineering, and Medicine

About Us

Ogmius is the newsletter of the Center for Science and Technology Policy Research which is published three times a year. The Center is within the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado-Boulder. The mission of CIRES, which was established in 1967, is to act as a national resource for multidisciplinary research and education in the environmental sciences. CIRES is jointly sponsored by the University of Colorado-Boulder and the National Oceanic and Atmospheric Administration.

On-Line Version

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