Ogmius

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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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Introduction

This issue of Ogmius features an article by Gilberto Corbellini of the Università di Roma "La Sapienza" analyzing the recent failure of a referendum in Italy to repeal a law limiting medically assisted fertilization, and the broader implications for science and technology in society.

For more information:

How Italy Voted on June 12, Who Lost – And Why (http://www.chiesa.espressonline.it/dettaglio.jsp?id=34501&eng=y), S. Magister

Italian Law 40/2004: a view from the 'Wild West' (http://www.ingentaconnect.com/content/repro/rebi/2006/00000012/00000001/art00003), M. Sauer.

The new Italian law on assisted reproduction technology (Law 40/2004) (http://jme.bmjjournals.com/cgi/content/abstract/31/9/536), V. Fineschi, M. Neri and E. Turillazzi

Eurobarometer 224: Europeans, Science and Technology (http://europa.eu.int/comm/public_opinion/archives/ebs/ebs_224_report_en.pdf)

Eurobarometer 225: Social Values, Science and Technology (http://europa.eu.int/comm/public_opinion/archives/ebs/ebs_225_report_en.pdf)

Ogmius Exchange
Reproductive medicine, politics and religion in Italy: Reflections on the 2005 referendum

In June 2005, Italy held a referendum on repealing the law on medically assisted fertilization (Law 40, February 19, 2004), which limits access to artificial reproduction to infertile couples, prohibits the donation of gametes or their use, and forbids the cryopreservation of embryos, preimplantation genetic diagnosis (PDG), and research on human embryos. The referendum was invalidated because turnout was only 25%, well below the 51% quorum required by the Italian constitution. Thus the law remains unchanged.

The Italian scientific community took an active part in the political and cultural debate over the referendum. As with the Swiss referenda concerning research on embryonic stem cells (2004) and GMOs (2005), and the California vote on Proposition 71 (2005), Italian scientists found themselves at

Ogmius Exchange Continued

the center of a heated controversy over whether reproductive biotechnology threatens humankind or whether it just can be abused. They had to face the challenges of communicating rationally and pragmatically with each other and with society on ethically controversial issues, on the aims of scientific research, and on its reliability.

The Italian scientific community proved to be neither influential nor effective. It was divided over empirical questions such as whether adult stem cells have the same potential as embryonic stem cells. In fact, only a few scientists who spoke defended the law and said that there is no need of embryonic stem cells for the new regenerative therapies. But this minority viewpoint was amplified by the media and the Catholic Church to transmit to the public the idea that Italian scientists were split into two equivalent halves. What happened confirms that when scientific data are still uncertain they can be used in the political arena as any other kind of logical-rhetorical argument to uphold a thesis or its opposite. Consequently, what happened in Italy should encourage all scientific communities to reflect on and foresee what effective role science might play in similar types of political and cultural debates.

To better understand the present situation, it is necessary to recall the recent history of science policy in Italy. In the 1960's a few science managers such as Adriano Buzzati-Traverso and Felice Ippolito tried to introduce a merit-based system and results assessment to replace patronage when evaluating scientists who apply for a university position or a grant. But their actions were unsuccessful and research funding, as well as scientific and academic careers, became more and more dependent on political affiliations. Consequently Italian governments started to support scientists mainly on the basis of political-cultural conveniences or of their academic power, rather than on the basis of their specific competency and abilities.

The context of the referendum is a good representation of the political climate in today's Italy. For many years Italy was one of the few countries in the world without a law on medically assisted fertilization because, on the one hand the Catholic Church wanted it outlawed, and on the other lay politicians wanted it regulated. The situation stalled until the majority of representatives in the Italian Parliament were observant Catholics, and realized that one of the two positions could prevail.

The politicians who rely on the Catholic Church's guidance on ethical and regulatory issues, together with liberal right-wing politicians who sought an instrumental alliance with the Church, drafted a law that included all of the Vatican's objections to assisted fertilization. They sought the advice of various experts, physicians and researchers, but the final bill ignored the opinion of those doctors and researchers who denounced the standards which were being proposed as contrary to the prevailing medical opinion on the subject of reproductive medicine.

After the law was passed, some parties and associations sought a referendum to repeal the law. The Italian constitutional court rejected the application for a referendum to repeal the law, but granted four referenda aiming at modifying the main prohibitions.

Having understood that the "yeses " would prevail since polls showed a majority of Italians thought most of the prohibitions were wrong, the Catholic Church cleverly adopted the strategy of persuading people who would have otherwise voted "no" to not vote at all so that the necessary 51% quorum would not be reached.

Another strategy adopted by the Catholic political hierarchy was the creation of a committee called "Science and Life", which maintained that the law's prohibitions were scientifically and medically justified. Bruno Dallapiccola, an eminent Italian geneticist and professor of medical genetics at the University of Rome "La Sapienza" who is also the head of the Mendel Institute, and the physician Paola Binetti were appointed to chair the committee. The latter was then joined by mostly Catholic jurists and gynecologists. Others involved in the abstention campaign included Angelo Vescovi, a professor at Milan's San Raffaele University and author of well-known if controversial studies on the subject, who distinguished himself for the aggressiveness with which he has publicly maintained that research on embryonic stem cells is pointless.

A counter-committee was created called "Research and Health." It was joined by hundreds of scientists and physicians who signed a petition in favor of the four referenda. The Research and Health Committee emphasized the law's inadequacy from the viewpoint of good clinical practice, as well as the obvious manipulation of scientific information by those who defended it and who urged citizens not to vote.

The Accademia Nazionale dei Lincei expressed its belated opinion only on the issue of research on extra embryos, insisting that "the loss or elimination of already existing frozen embryos should be avoided" and that "parliament should rapidly pass a law allowing the donation of such embryos, under very strict conditions."

The outcome of the referendum was a defeat for those seeking to repeal the law. The percentage of Italians who went to vote was not much lower than that which allowed the Swiss to authorize research on stem cells (25.9% in Italy and 37% in Switzerland), and the percentage of those in favor of repealing the law was very similar (24.4% in Switzerland and 23.1% in Italy). Compared to the California vote on Proposition 71 last

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November, the Italian referendum campaign was all but unsuccessful: in California, 57% of registered voters went to the polls, and 31.7% of them voted in favor of the proposition. One observation that emerges from a comparison with the Swiss and California cases is the disinterest of the Italian business community. The Swiss and California committees that fought to allow research on embryonic stem cells were consistently and openly supported by corporations, entrepreneurs, and patients associations, but the Italian business community was not supportive of efforts to defend freedom of research and biomedical innovation.

Some possible explanations for the failure of the efforts to change the law come from the two most recent "Eurobarometers" (Special Eurobarometer 224 "Europeans, Science and Technology" and Special Europbarometer 225 "Social Values, Science and Technology") focused on the public perception of science and the moral values that influence science policy. These surveys indicate that the Italian referendum confirms the difficulties scientific research is meeting in European democracies. These Eurobarometers show that in countries with a higher rate of scientific literacy, citizens who are more satisfied with the quality of their lives and who acknowledge the merits of science and technology tend to emphasize the risks of research and innovation including research on stem cells. Among the 25 members of future Europe, Italy remains one of the countries where people are more willing to accept the new applications of genetics and biotechnology (except for GMOs), and in particular stem cell engineering.

Of course, it may be mere chance but the percentage of Italians who went to the polls for the referendum corresponds to the percentage of people who understand how the scientific method works, i.e. about 25 per cent of the population, according to a 2001 Eurobatometer study. It is impossible to judge whether scientific illiteracy, which in Italy is slightly higher than in north European countries, played a role in abstention because people did not really understand what they were asked to vote for or against. Those who advocated a "yes" vote were unable to communicate effectively and to define correctly the terms of the debate, which in the end turned mostly around when life begins, the moral status of the embryo, the menacing nature of scientific research and, above all, the risk of eugenics.

The results of the referendum may be due to the apparent standstill of the process of secularization in Italy. Eurobarometer 225 shows that Italy is one of the most religious countries in Europe with a very low percentage of atheists (6%). This confirms a phenomenon sociologists have already observed: starting from the 1990s, there has been a halt in the process of secularization of the country and in some areas even a reversal of that process. It is true that the Italians are pragmatic people and in order to have healthy children they have always made, and are still making, use of reproductive medicine (mainly prenatal diagnosis and abortion), ignoring the moral precepts of the Church. However, they may have found it difficult to assess the consequences of the proposed legal changes to their personal freedoms as well as the results it can produce in some medical situations.

The consequences of law 40/2004 on reproductive medicine in Italy is becoming apparent. Until last year, Italian clinics and research centers specializing in reproductive medicine were on the cutting edge. Now their level of excellence is bound to collapse and our best gynecologists and geneticists will likely take their competence out of the country. Of course, the couples who can afford to will go abroad. In fact, they have already been doing so in larger numbers for the last two years – from 1,315 in the year before the law to 3,610 in the year after the law. Moreover, since the law went into effect pregnancies declined – from 4,922 in 2003 to 4,613 in 2004 – and early abortions increased by 2-5%, depending on the woman's age.

The calculated aim of the Catholic Church was certainly to discourage the use of assisted fertilization. What is disputable is whether this was also the aim of the majority of Italian citizens, considering what they seem to expect from medicine.

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Visiting Scientist Perspective

Introduction

Melanie Roberts recently completed a Ph.D. in neurobiology at the University of Washington in Seattle. In 2004, she founded the Forum on Science Ethics and Policy (http://www.fosep.org/) (FOSEP), an initiative to stimulate dialogue among scholars, the public, and policy makers about the role of science in society. Melanie is visiting the Center for Science and Technology Policy Research before heading to Washington, D.C. as an AAAS Congressional Fellow.

Visiting Scientist Perspective

Updating the social contract for science: A scientist's perspective

By Melanie Roberts, melanie@fosep.org

Science policy scholars agree that it is time to update the social contract for science as outlined by Vannevar Bush in Science, the Endless Frontier. Many policy scholars also assume that scientists are ardent supporters of Bush's linear model of science and are opposed to making the research enterprise more attuned to societal problems. Though empirical research on the attitudes of scientists is lacking, I question that assumption based on my experience in the scientific community. Most of us have heard neither of Vannevar Bush nor of a 'social contract' for science. And many of us – particularly early-career scientists – are frustrated by the tentative connection between our individual efforts and societal outcomes. Thus, many scientists would embrace the concept of a new social contract for science. However, there are few calls for a revolution from within the scientific community because we don't have a good idea of what is broken or how to fix it. Additionally, any talk of change - particularly in funding priorities - creates anxiety in an already highly competitive funding environment. The science policy community can call scientists to action by raising awareness of the need for a change and by working with the scientific community to create tenable, non-threatening policy options to improve the connection between scientific research and societal outcomes.

The current system, characterized by Bush's linear model, holds that the government promotes innovation by funding basic research to increase the reservoir of knowledge. Subsequently, market forces drive industry to use this knowledge to solve societal problems. Though new technologies have improved our lives in many ways, the current system does not do a good job of solving some of our most pressing problems, predicting unintended consequences of new technology, or serving the poor and underrepresented. To adequately address these problems, we will likely need to tweak both inputs to the knowledge reservoir and the outputs from it.

Scientists will be most receptive to strategies that create new outputs and do not require considerable changes in the day-to-day conduct of science. One such strategy is to build and strengthen organizations that serve as bridges between science and society. These organizations could distill information from the knowledge reservoir into a form that is useful to end-users, develop products for underserved populations, and regulate new technologies. Examples of bridge organizations include Ethical, Legal and Social Implications (ELSI)-funded programs and the defunct Office of Technology Assessment. Others may have very different structures, such as non-profit companies, interdisciplinary university centers, or government agency offices. Successful bridge organizations will involve an interdisciplinary team, including scientists, end-users, science policy scholars, economists, and others. Bridge organizations can also be critical players in modifying inputs to the knowledge reservoir. For example, the Bill and Melinda Gates Foundation (http://www.gatesfoundation.org/default.htm) has influenced the inputs to the knowledge reservoir in international health by funding research grants that address a list of Grand Challenges.

Creating drastic changes in the knowledge reservoir or asking scientists to create outputs other than the scholarly publications that are currently seen as the 'basic research' product will require modifications to the organization, culture, and reward structure of the scientific enterprise itself. This will not be an easy task in such a deeply entrenched system. But, just as the culture of society at large changes over time, so can science. Such changes will require a mix of top-down and bottom-up strategies and a gradual implementation. The best place to begin a cultural transformation is in the educational system. Training programs should strive to create a more cosmopolitan scientist who sees his or her role not as a creator of knowledge who is detached from society, but as a public servant who should make an important contribution to society. To do this, undergraduate and graduate science education should include prerequisites in science studies, and existing research ethics training should combine microethics topics in research integrity with macroethics topics that explore the responsibility of science to society. Further, service learning projects that introduce students to some demonstrated mechanisms that connect science and society should be emphasized and rewarded.

By definition, negotiating a new contract between science and society requires the agreement of both parties. Scientists are ready to embrace gradual changes that will increase the social benefits of their work. However, scientists don't have a clear enough understanding of the relationship between science and society to negotiate the contract by themselves. The science policy community will play a critical role as an arbiter of the new contract between science and society.

Center News

Roger Pielke, Jr. and Rad Byerly to speak at 2006 Gordon Research Conference on Science and Technology Policy August 13-18

Roger Pielke, Jr. will lead a panel discussion with David Guston and Robert Lempert titled "Decision making in a world of uncertainty."

Abstract: *Uncertainty means that more than one outcome is consistent with one's understandings. Often decision makers seek to reduce uncertainty in hopes of clarifying understandings of the relationship between alternative possible courses of action and their outcomes. Science too focuses on reducing uncertainty. This convergence on uncertainty makes for a convenient marriage of science and decision making. But there are times when the marriage is strained, such as when policy makers substitute science for action in cases where uncertainty is irreducible or when scientists coalesce around a gridlocked political debate, when effective policy making might require new policy options be introduced into debate. This closing session will focus on case studies in which decision making under uncertainty is examined from the perspectives of science, policy and politics.*

Rad Byerly will participate in a session titled "What is science and technology policy?" He will address "What are the issues involved with science for policy versus policy for science?"

For more information visit the Gordon Conference website (http://www3.utsouthwestern.edu/ethics/STP-GRC.htm).

Roger Pielke Jr. to Speak at "Climate Change and the Future of the American West" Conference June 8 and 9 at the University of Colorado

Roger Pielke, Jr., will moderate a session June 8 at 2:00 pm titled "Finding Solutions, State and Local Initiatives," and will participate in a panel on June 9 at 10:45 am titled "'Doing Something'" About Climate Change. Taking the Long View: Climate Change and the Future of the American West." Both events are part of the "Climate Change and the Future of the American West" conference sponsored by the Natural Resources Law Center at the University of Colorado. For more information see the workshop website (http://www.colorado.edu/law/centers/nrlc/summerconference/index.htm).

Faculty Affiliate Lisa Keränen Wins Award

Faculty affiliate Lisa Keränen (http://sciencepolicy.colorado.edu/about_us/meet_us/lisa_keranen/) (as first author) and her co-authors won the Wrage-Baskerville award for their paper: "Myth, Mask, Sword, and Shield": Dr. John H. Marburger III's Rhetoric of Neutral Science for the Nation," judged this year's best in the large public address division. The paper was based on a lecture given by Dr. Marburger as part of the Center's presidential science advisor lecture series.

See Keränen, Lisa, Lisa Irvin, Jason Lesko, and Alison Vogelaar, "'Myth, Mask, Sword, and Shield': Dr. John H. Marburger III's Rhetoric of Neutral Science for the Nation." Paper to be presented at the annual meeting of the National Communication Association, San Antonio, Texas: Nov., 2006. Winner of the 2006 Wrage-Baskerville Award for Top Paper in Public Address.

CIRES Outstanding Service Award

The Center's Ami Nacu-Schmidt, Linda Pendergrass, and Bobbie Klein have received the CIRES Outstanding Service Award for their efforts in organizing the presidential science advisor lecture series.

"Coping with Climate Change: A Symposium Highlighting Activities at the University of Colorado to Help Decision Makers Prepare for the Future"

Bobbie Klein organized a symposium titled "Coping with Climate Change: A Symposium Highlighting Activities at the University of Colorado to Help Decision Makers Prepare for the Future." Held on April 4 and sponsored by the Western Water Assessment, the symposium featured ten presentations about climate change-related activities at CU. For more information and to view the presentations visit the symposium website (http://wwa.colorado.edu/links/climate_change_symposium.html).

Center Website Visitation Way Up

In March 2006, an average of approximately 10,000 people visited the Center's website (sciencepolicy.colorado.edu) each day. Website traffic has grown steadily since the Center's inception. Our site received an average of 325 unique visitors per day in 2002, approximately 750 visitors per day in spring 2003, 1,000 visitors per day in spring 2004, and approximately 2800 visitors in spring 2005.

Prometheus Kudos

A recent article in Science about the "blogging" phenomenon, Environmental Science Adrift in the Blogosphere (http://www.sciencemag.org/cgi/content/full/312/5771/201), by Alison Ashlin and Richard J. Ladle, referred to the Center's weblog, Prometheus, as an example of one of ten "excellent, informative" science blogs.

Project News

Science Policy Assessment and Research on Climate ("SPARC")

http://sciencepolicy.colorado.edu/sparc

SPARC has had a very busy past few months. It held its first team workshop in December. Elizabeth McNie successfully defended her Ph.D dissertation prospectus which focuses on evaluating the role of science policy decision making in RISA programs, building upon the 2005 SPARC RISA Hawaii Workshop. A draft report of the 2005 RISA Workshop will be available this summer. Roger Pielke and Dan Sarewitz will be editing a special issue of Environmental Science and Policy titled Reconciling the Supply of and Demand for Science: The Case of Carbon Cycle Research. A draft report of the June 2005 workshop "Practical Strategies to Reconciling the Supply of and Demand for Carbon Cycle Science" has been sent to all participants. And it has several new publications:

- Pielke, Jr., R. A. 2006. Disasters, Death, and Destruction: Account for Recent Calamities (http://sciencepolicy.colorado.edu/admin/publication_files/resource-2449-2006.02.pdf), a short essay distributed to accompany the 7th Annual Roger Revelle Commemorative Lecture, Ocean Studies Board, National Research Council of the National Academy of Sciences, held 15 March at the Baird Auditorium, Museum of Natural History, Smithsonian Institution, Washington, DC.
- Pielke, R. A., 2005. Attribution of Disaster Losses (http://sciencepolicy.colorado.edu/admin/publication_files/resource-1840-2005.47_correction.pdf), Science, Vol. 310, December 9, pp. 1615. Response to "Attribution of Disaster Losses" by Evan Mills on pp. 1616.
- Pielke, Jr., R. A., C. Landsea, M. Mayfield, J. Laver and R. Pasch, 2005. Hurricanes and global warming (http://sciencepolicy.colorado.edu/admin/publication_files/resource-1766-2005.36.pdf), Bulletin of the American Meteorological Society, 86:1571-1575.

SPARC presentations:

- Dilling, L., Maricle, G., and Pielke, Jr., R. "Applying science policy research: The case of the carbon cycle science program." American Meteorological Society Annual Meeting, 29 January-2 February, 2006.
- Dilling, L., Pielke Jr., R. and Sarewitz, D. "Assessing science policies for climate research: New options for organizing research in support of decision making under uncertainty." American Meteorological Society Annual Meeting, 29 January-2 February, 2006.
- Dilling, L. "Usable" Carbon Cycle Science: Creating science policies that facilitate the use of research in decision-making. Natural Resources Ecology Laboratory, University of Colorado, 27 January, 2006.
- Dilling, L. "Alternatives to the Linear Model: Implications for climate science policies." Consortium for Science, Policy and Outcomes, Arizona State University, 19 January, 2006.
- Dilling, L., Pielke Jr, R., and Sarewitz, D. The missing link: Creating science policies that facilitate the use of research in environmental and water-related decision-making. American Geophysical Union Fall Meeting, 5-9 December 2005.
- Maricle, G. 2006. Science Policy Assessment and Research on Climate, Coping with Climate Change symposium, 4 April, 2006, Boulder, CO.
- Pielke, Jr., R. A. 2006. The role of societal and climate factors in historical U.S. hurricane damage, Workshop on Tropical Cyclones and Climate Change, IRI Lamont-Doherty Earth Observatory, Columbia University, 28 March, New York.
- Pielke, Jr., R. A. 2006. Normalized Hurricane Damage in the United States: 1900-2005, Workshop on Hurricane Research Priorities, National Science Board, 7 February, Boulder, CO.
- Pielke, Jr., R.A., 2006. Disasters and Climate Policy, Nicholas School of the Environment, Duke University, Durham, NC, 9 March 2006.

Upcoming SPARC Workshops

Climate Change and Disaster Losses Workshop: Understanding and Attributing Trends and Projections (http://sciencepolicy.colorado.edu/sparc/research/projects/extreme_events/munich_workshop/index.html), May 25 and 26, 2006, Hohenkammer, Germany. Cosponsored by Munich Re Company, the GKSS Institute for Coastal Research, and the Tyndall Centre for Climate Change Research, this workshop will bring together experts from around the world to summarize and address the following questions: (1) First, what factors account for the dramatically increasing costs of weather-related disasters (specifically, floods and storms) in recent decades? (2) And, second, what are the implications of these understandings, for both research and policy? A report and peer-reviewed publication will be produced.

Project News Continued

Decision Making Under Uncertainty: Scientists' Ranking Stressors on the Central Arizona Water Supply. Fall 2006, Arizona State University.

Population growth, economic development, and recreational needs compounded by scientific uncertainty associated with climate variability and change are increasing the complexity of water management issues in Central Arizona. While climate variability and change can affect supply of water, other, local factors can have multifaceted (and sometimes deleterious) stress on water resources. These factors include land-use/land cover change, pollutant loading, inefficiencies in water supply system, growing demand for landscape watering, and the persistence of water-intensive agricultural systems. Given the large degrees of uncertainty about climate change and associated variability evaluating sensitivity to other stressors from regional and local levels would be appropriate for assessing societal vulnerability of water resources. It is in this connection that CSPO is convening a 1 ½ day workshop of scientists (20-25) studying stress on water resources of the arid region of the United States, as part of the Science Policy Assessment and Research on Climate (SPARC) project. The goals of this workshop are: 1) to generate a ranking based on the relative importance of the various stressors; 2) to identify deficit in current research portfolio, and 3) to increase collaborative research among the scientists. For more information, contact cspo@asu.edu.

Project News

Presidential Science Advisor Lecture Series

http://sciencepolicy.colorado.edu/scienceadvisors

The Center's lecture series, "Policy, Politics, and Science in the White House: Conversations with Presidential Science Advisors," concluded on April 11 with a talk by Dr. Frank Press, science advisor to President Jimmy Carter from 1977-1980. Dr. Press addressed a crowd of about 100 people at the University of Colorado and discussed successful and failed efforts to provide science advice to policymakers. The series has also included talks by Drs. John Marburger (G.W. Bush), John Gibbons (Bill Clinton 1st term), Neal Lane (Bill Clinton 2nd term), George Keyworth (Ronald Reagan), Edward David (Richard Nixon), and Donald Hornig (Lyndon Johnson).

Dr. Frank Press

For more information including transcripts and webcasts of past talks visit the series website (http://sciencepolicy.colorado.edu/scienceadvisors/). Each science advisor forum will be broadcast on Boulder Municipal Channel 8 television station and also as a live webcast – check the Channel 8 schedule (http://www.ci.boulder.co.us/channel8/schedule.html) for more information.

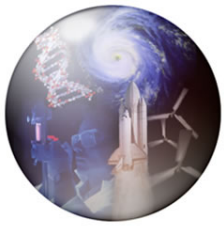
The Center is compiling a book based on the series featuring contributions by each of the advisors who appeared in the series and chapters by other authors addressing science and technology policy issues at the federal level. Publication is expected to occur sometime in 2007.

Project News

Science and Technology Policy Certificate Program

http://sciencepolicy.colorado.edu/stcert

The Science and Technology Policy Certificate Program (http://sciencepolicy.colorado.edu/stcert/) is now entering its 3rd year. Ten graduate students have completed the program. One program alumnus serves on the staff of the House Science Committee, and another will be interning for the second summer with the Office of Management and Budget (OMB).



Graduate Student News

The Center for Science and Technology Policy Research is home to several graduate students studying the interface of science and policy. Here's what some of them are up to:

Adam Briggle (http://sciencepolicy.colorado.edu/about_us/meet_us/adam_briggle/), an Environmental Studies Ph.D. candidate, is writing his dissertation titled "The President's Council on Bioethics: Science, Democracy, and the Good Life." His short-term future prospects are highly uncertain.

Erik Fisher (http://sciencepolicy.colorado.edu/about_us/meet_us/erik_fisher/) will defend and hopes to graduate in May with a Ph.D. in Environmental Studies. The tentative title of his dissertation is "Midstream Modulation: A Case Study in the Implementation of US Federal Nanotechnology "Ethics Policy."" Erik has a fellowship to study technology assessment in the Netherlands this summer and plans to start as a post-doc at ASU jointly for the Consortium for Science, Policy, and Outcomes (CSPO) and the Center for Nanotechnology and Society (CNS).

Joel Gratz (http://sciencepolicy.colorado.edu/about_us/meet_us/joel_gratz/) is completing both his MBA and his M.S. in Environmental Studies this May. Joel hopes to stay in Boulder and to continue working for ICAT, a Boulder-based hurricane and earthquake insurance company, in a role that combines both science and business responsibilities.

Jimmy Hague (http://sciencepolicy.colorado.edu/about_us/meet_us/jimmy_hague/) is finishing up his first year in Environmental Studies with plans to graduate next May. This summer he will be traveling to London to do an internship with the U.S. State Department. He will serve as the science and environment intern at the American Embassy.

Nat Logar (http://sciencepolicy.colorado.edu/about_us/meet_us/nat_logar/) recently passed his preliminary examinations in Environmental Studies and is planning to defend his prospectus at the end of the spring semester.

Genevieve Maricle (http://sciencepolicy.colorado.edu/about_us/meet_us/genevieve_maricle/) successfully passed her comprehensive exams in March, and is now set to spend many long days and nights staring at her computer struggling with her dissertation (titled: "Shaping Science: How to Turn Science Studies into Science Action") this coming year. She was also recently appointed chair of the campus-wide Environmental Justice Initiative.

Elizabeth McNie (http://sciencepolicy.colorado.edu/about_us/meet_us/elizabeth_mcnie/) recently defended her prospectus and is now working full-time on her dissertation titled "Co-producing useful scientific information for climate policy: Informing science policy and decision support." She will graduate in May 2007.

Shali Mohleji is working on her Ph.D, focusing on homeland security policy. She will be interning for her second summer at the Office of Management and Budget.

Elizabeth McNie Presentations

In March, ENVS Ph.D candidate Elizabeth McNie (http://sciencepolicy.colorado.edu/about_us/meet_us/elizabeth_mcnie/) presented a poster at the 36th Annual Arctic Workshop, held at the Institute of Arctic and Alpine Research at the University of Colorado titled, "Exploring Climate Change Issues in Iceland: The Perils and Promise of Interdisciplinary Research." The poster highlighted preliminary findings on paleoclimate research and climate policy research conducted with an interdisciplinary team during the summer of 2005 with co-authors Yarrow Axford, Amanda Haag, and Hillary Rosner. In April, Elizabeth presented a poster titled, "Linking Science with Policy: Are Boundary Organizations the Answer?" at the Cooperative Institute for Research in Environmental Sciences (CIRES) Member's Council All-Institute Symposium. This poster highlighted research related to Elizabeth's dissertation with regard to organizations that span the gap between the culture of science and the culture of policy in order to increase the utility of scientific information for policy decisions. Elizabeth also recently presented a workshop for the Lead Graduate Teacher Program called, "Building Healthy Group Dynamics in the Classroom."

Center Students Present Posters at CIRES Symposium

In addition to Elizabeth McNie, two other Center graduate students presented posters at the first institute-wide symposium sponsored by CIRES:

- Science Policy Assessment and Research on Climate by Genevieve Maricle
- Integrating Societal Concerns into Nanotechnology Research by Erik Fisher

Marilyn Averill Presentations

ENVS Ph.D candidate Marilyn Averill (http://sciencepolicy.colorado.edu/about_us/meet_us/marilyn_averill/) gave the following two presentations this spring.

Averill, M. "Climate Litigation: Democratic Participation, and Civic Education." Western Political Science Association

Graduate Student News Continued

Annual Meeting, March 19, 2006.

Abstract: *This paper will consider the implications of current climate-related litigation for democratic participation and policy development. Joseph Sax describes environmental litigation as "a means of access for the ordinary citizen to the process of governmental decision-making." Sheila Jasanoff emphasizes the importance of litigation in civic education and in providing information "about the epistemological, social, and moral dilemmas" associated with science and technology issues. Others argue that environmental litigation undermines democracy by shifting decisions away from elected officials. Robert Kagan maintains that adversarial legalism can block cooperation and frustrate justice. Much of the work on environmental litigation focuses on cases filed under citizen suit provisions in environmental laws. Current U.S. climate litigation includes cases based on a variety of legal theories and allows study of the role of the courts in an area where Congress has not yet provided explicit legislation. Climate litigation, as publicized by the media, may serve to educate the public about the science of climate change, alert people to possible impacts from a changing climate, identify possible winners and losers and illuminate equity issues, raise questions about responsibility for injuries resulting from climate change, and stimulate debate about how society should balance environmental and economic costs and benefits and how to make decisions when science is uncertain.*

Averill, M. "Climate in the Courtroom." Presentation at "Coping with Climate Change: A Symposium Highlighting Activities at the University of Colorado to Help Decision Makers Prepare for the Future", April 4, 2006.

Abstract: *Citizens concerned about climate change are turning to the courts to resolve climate-related issues. Litigants will use law, science, economics, ethics, policy, and other fields in arguments to support of their claims. Climate litigation provides a laboratory for study of how courts integrate these factors to influence policy and how court decisions may shape perceptions about the components themselves.*

Each court decision will shape climate policy and have implications far beyond the courtroom. Challenges against state and federal governments will clarify their authority and responsibility to address climate issues under existing law. Claims against industry will determine whether corporations should be held responsible for actions contributing to the greenhouse effect. When publicized by the media, climate litigation can educate the public about the science and possible impacts of climate change, illuminate issues about fairness and responsibility, and stimulate debate about how society should respond. In addition, court decisions about expert testimony and the treatment of uncertainty can affect perceptions of the legitimacy, credibility, and salience of climate science, both inside and outside the courtroom.

Marilyn also has been involved with the planning committee for the Energy, Poverty Reduction, and Gender sessions for the World Renewable Energy Congress (WREC IX) conference in Florence, Italy in August and will give a paper there.

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Recent Center Publications

Fisher, E., and R. Mahajan, 2006. ***Contradictory intent? US federal legislation on integrating societal concerns into nanotechnology research and development*** (http://sciencepolicy.colorado.edu/admin/publication_files/resource-2452-2006.03.pdf), Science and Public Policy, Volume 33, Number 1, February 2006, pp. 5-16.

Abstract: *This paper argues that the 21st Century Nanotechnology Research and Development (R&D) Act embodies an unresolved tension between two policy trends that pose a growing dilemma for future science and technology (S&T) policy makers: the imperative towards rapid technological implementation; and mounting pressure to conduct technology development with more effective regard to societal considerations. The tension emerges when comparing various Program Activities' set forth in the Act that require divergent policy models, by which the legislation attempts to balance international competition with concern over the perceived risks of nanotechnology applications. By prescribing the integration of societal and technical concerns during nanotechnology R&D, the Act could mark a radical shift in S&T policy in so far as it allows the consideration of societal concerns to influence technological activities and outcomes.*

Pielke, Jr., R. A., 2006. ***Disasters, Death, and Destruction: Account for Recent Calamities*** (http://sciencepolicy.colorado.edu/admin/publication_files/resource-2449-2006.02.pdf), a short essay distributed to accompany the 7th Annual Roger Revelle Commemorative Lecture, Ocean Studies Board, National Research Council of the National Academy of Sciences, held 15 March at the Baird Auditorium, Museum of Natural History, Smithsonian Inst., Washington D.C.

Excerpt: *A disaster happens when an extreme event occurs in the context of societal vulnerability. Nowhere is the meeting of vulnerability and extreme more tangible than where the land meets the sea. This was horrifically apparent on 26 December 2004 when a powerful earthquake under the eastern Indian Ocean resulted in a massive tsunami that killed more than 280,000 people and caused billions of dollars in damage. Other disasters at the ocean-land boundary are similarly fresh in our minds — the U.S. hurricane seasons of 2004 and 2005 resulted in hundreds of billions of dollars in damage and more deaths than in the previous 35 years combined. We will be responding to Hurricane Katrina for years to come.*

Vogel, J.M., 2005. ***Perils of paradigm: Complexity, policy design, and the Endocrine Disruptor Screening Program*** (http://sciencepolicy.colorado.edu/admin/publication_files/resource-1845-2005.53.pdf), Environmental Health: A Global Access Science Source 2005, 4:2.

Abstract: *The Endocrine Disruptor Screening Program (EDSP), mandated by the United States Congress in the Food Quality Protection Act of 1996, attempts to protect public health from adverse endocrine effects of synthetic chemical compounds by establishing a new testing regime. But the complexities and uncertainties of endocrine disruption and its broader regulatory and social context all but ensure the failure of this policy. This article addresses the issues facing EDSP comprehensively and in detail, in order to move beyond the current regulatory paradigm and foster discourse on a positive role for scientists in support of EDSP's end goal: to protect public health.*

Center Staff in the News

Roger Pielke, Jr. was quoted in an April 9, 2006 Daily Camera article on the role of academic earmarks on climate research, ***'Pork' pares research: NOAA climate-study projects hurt by federal earmarking*** (http://www.dailycamera.com/bdc/science/article/0,1713,BDC_2432_4608242,00.html), by Todd Neff.

Excerpt: *Earmarking takes the job of prioritizing research away from lab directors and makes it "almost entirely political," said Roger Pielke Jr., director of the Center for Science and Technology Policy Research at the University of Colorado. "Science has a long track record of being merit-based," Pielke said. "Earmarking pits jobs and moving money against excellence, and we shouldn't be surprised when excellence suffers when that occurs."*

CU's Pielke said universities should also take action against certain earmarking. He cited the University of Michigan as an example of an institution with strict policies that limit earmarking. "I don't see Congress necessarily making a distinction between a science project and a road project," Pielke said. "So it's up to the universities on this issue." On a Web page explaining its policy, Michigan officials say scientific earmarking "wastes taxpayer money and slows the scientific progress that would be made if the same sums were allocated on a merit basis." "It's something I've pushed at the University of Colorado," Pielke said. "It hasn't gotten legs so far."

Research by Center graduate student Joel Gratz about lightning and college football stadiums was discussed in an article in the Winter 2005-06 UCAR Quarterly, ***Storms and Stadiums*** (http://www.ucar.edu/communications/quarterly/winter0506/storms.jsp), by Bob Henson.

Excerpt: *Although tornadoes are the worst fear of severe-weather planners on many campuses, lightning is a widespread and serious threat in its own right. The lightning threat to sports fans gets precious little attention, according to Joel Gratz, a master's student*

Center Staff in the News Continued

in environmental studies and business at the University of Colorado. Gratz attended a CU game in Denver in August 2003 with fellow CU students Ryan Church and Erik Noble. A lightning-studded storm interrupted the game for the better part of an hour, but stadium officials gave no instructions to spectators, many of whom stayed in their seats throughout the downpour. "We wondered why the event managers gave no direction to protect 76,000 people from the danger of lightning," says Gratz.

That soggy night led the three students to delve further into the topic and to write an article for Weatherwise magazine. They now have a paper on stadium safety and lightning soon to appear in the Bulletin of the American Meteorological Society. One finding was that the nation's biggest college football stadiums happen to coincide with some of the areas of greatest lighting frequency, from the upper Midwest to the Southeast and Great Plains. Gratz and his colleagues note that the usual rule of thumb—take shelter if thunder follows lightning by less than 30 seconds—can be hard to employ when the noisy crowds and bright lights of a big game make it hard to see and hear what's going on with the weather.

S&T News

Managing Drought and Water Scarcity in Vulnerable Environments: Creating a Roadmap for Change in the U.S., 18–20 September 2006 • Boulder, Colorado

Drought-related impacts can be expected to increase in intensity in the twenty-first century as human population increases and land uses change. To evaluate current drought-related problems and anticipate future issues, GSA and its partners announce a participatory conference to be held 18–20 September 2006 near Boulder, Colorado. While broad in scope, the meeting will focus on identifying successful strategies for drought and water scarcity management and on developing a clear and decisive action plan. The goals of this meeting are to create an integrated, interactive, future-oriented forum for understanding and improving our management of drought and water scarcity in the United States and to stimulate national debate through the publication and wide distribution of a science- and policy-based discussion document.

This meeting is designed to promote collaboration between the policy and science communities. Through a combination of plenary and invited talks, interactive roundtable and breakout group discussions, and poster presentations of case studies and innovative research and outreach efforts, participants will derive key lessons learned from national and relevant international experience and current policies and practices (e.g., factors involved in decision making, facilitators and barriers to implementing action, and treatment of underlying causes versus symptoms).

Registration limited to 250 people. Abstracts may be submitted 1 April 2006 through 26 June 2006. See http://www.geosociety.org/meetings/06drought/ for details, including abstract submission, registration, and lodging. For more information or if you have any questions, please contact Deborah Nelson, 303-357-1014, dnelson@geosociety.org.

Jobs

Supervisory Physical Scientist or **Supervisory Social Scientist**, Salary range: $107,521-139,774.

The Climate Program of the National Oceanic and Atmospheric Administration (NOAA) is seeking an energetic individual with considerable experience in outcome-oriented, applied environmental research to lead a new division known as Climate Assessments and Services. The incumbent is responsible for managing a division that leads the effort to connect climate assessments, research and services to broader public interest goals associated with adapting to climate variability and change. The ideal candidate will have demonstrated themselves to be an innovator and initiator, will have experience working across public and private sector organizations, will have worked in the field of applied climate and environmental research or in a setting which required on-going interaction with the environmental research community, and will have a vision for the implementation of federal investments linking new climate-related interdisciplinary research with national needs for building adaptive capacity for climate variability and change. Excellent verbal and written communication skills are essential as is the ability to work in a team of senior program managers in support of agency goals and mission requirements. Ph.D. or equivalent experience required.

Detailed job information and applicant instructions will be found at https://jobs1.quickhire.com/scripts/doc.exe under vacancy numbers OAR-HQ-2006-0092, 93, 94 and 96. Open to all U.S. Citizens. Posting dates: May 12 to June 26. The U.S. Department of Commerce is an Equal Opportunity Employer.

About Us

Ogmius is the newsletter of the Center for Science and Technology Policy Research which is published four 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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