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Introduction to the Ogmios Exchange

This month we present an exchange between

- Jim Tozzi, who was the first deputy director of the Office of Information and Regulatory Affairs at the Office of Management and Budget from 1981-1983, and is currently a member of the board of advisors to the Center for Regulatory Effectiveness (<http://www.thecre.com>), and
- Chuck Herrick, who served as associate director of the White House Council on Environmental Quality and assistant director of the National Acid Precipitation Assessment Program, and is currently a Vice President at Stratus Consulting (<http://www.stratusconsulting.com>).

The subject of the exchange is the Data Quality Act. In December 2000, Congress passed a little-known provision known as the Data Quality Act. The Act, which will go into effect next October 1, requires every federal agency to establish "guidelines ensuring and maximizing the quality, objectivity, utility and integrity of information (including statistical information)." Proponents of the Act, who include Mr. Tozzi,

contend that it will improve science-based policy making. By contrast, some critics of the Act are concerned that it will be used to impede environmental information and regulation. For more background, see:

- Center for Regulatory Effectiveness website- the organization that authored the provision (<http://www.thecre.com>)
- National Academy of Sciences, Ensuring the Quality of Information Disseminated by the Federal Government project (<http://www4.nas.edu/webcr.nsf/ProjectScopeDisplay/STLP-Q-02-01-A?OpenDocument>)
- Office of Management and Budget, Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies (<http://www.whitehouse.gov/omb/fedreg/reproducible.html>)
- Andrew C. Revkin, "Law Revises Standards for Scientific Study," New York Times March 21, 2002 (<http://www.nytimes.com/2002/03/21/politics/21DATA.html>)
- Roger Pielke, Jr., Flying Blind: The Data Quality Act and the Atmospheric Sciences (<http://sciencepolicy.colorado.edu/zine/archives/33/editorial.html>), WeatherZine Number 33

And now, on to the exchange ...

Ogmios Exchange

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

Few would argue against the proposition that science is routinely one of the key underpinnings of major regulatory decisions made by the federal government. In light of the significant effects that scientific, statistical, and financial information may have on prioritization and resource allocation in both the public and private sectors, it is crucial that such information be of high quality.

The recently passed Data Quality Act makes major strides in the federal decision making

process by requiring, for the first time, government-wide standards for the quality of information that federal agencies disseminate to the public. There is a clear connection between the Act's mandated standards and the decision making process because most influential public policy decisions will be published in some form and made available to the public.

As will be discussed below, increased confidence in the scientific information available to the government will eliminate one complicating

Ogmius Exchange Continued

factor in the difficult policy decisions which federal officials confront on a regular basis. Additional benefits in terms of transparency and public accountability can be expected as well.

The Data Quality Act and Its Implementation

The Data Quality Act was passed as part of the FY 2001 Consolidated Appropriations Act (Pub. L. No. 106-554, codified at 44 U.S.C. § 3516, note.) The Act requires OMB to develop government-wide standards for data quality in the form of guidelines. Individual agencies must then promulgate their own conforming guidelines based upon OMB's model, taking into account each agency's unique programs and information products. The agencies' conforming Data Quality guidelines are to be issued in final form by September 30, 2002, and must include an administrative mechanism through which the interested public may petition for the correction of information which is inaccurate, misleading, or otherwise not in accordance with the guidelines.

Implementation of the Data Quality Act has generally progressed on schedule, largely because OMB has exercised strong leadership. OMB issued proposed Data Quality guidelines in June 2001, received and evaluated public comments thereon, and issued final guidelines on January 3, 2002 (see 67 Fed. Reg. 369). OMB has directed agencies to issue their proposed Data Quality guidelines and to request public comment thereon by May 1st; to submit draft final guidelines to OMB for approval by July 1st; and to promulgate final guidelines by the statutory deadline.

CRE believes that it is very important that interested parties express their views to the agencies during the public comment period in order to effect a workable, fair, and efficient implementation of the Data Quality Act. How this process is structured may have a significant impact on how scientific information is utilized in the regulatory decision making process. Particularly, attention must be paid to ensuring that the provisions for information quality do not slow down the government's releases of information without justification.

Use of Scientific Information in Regulatory Decision Making Under the Data Quality Act

Passage of the Data Quality Act should not be viewed as implying that prior to the Act all government information was lacking in quality. However, the quality of information sources across agencies, or across programs within an agency, may not have been uniform. Thus, the goal of the Data Quality Act was to bring an important measure of consistency to the quality of government information by codifying the requirements that data used and disseminated by the federal government (both scientific data and other types of information) be objective, unbiased, transparent, and reproducible. Benefits of the legislation will

flow to regulators, the scientists, the regulated community, and the public.

Through OMB's issuance of Data Quality guidelines applicable to all federal agencies, scientists can now know with some certainty the quality standards against which the information they generate will be judged, thereby allowing them to develop internal systems for achieving those standards. In this sense, the guidelines will ultimately reduce administrative burdens on the scientific community, particularly for "influential data" that will be subject to peer review or other forms of heightened scrutiny.

OMB has also stated that third party petitions or other information submissions to federal agencies must meet the standards of the Data Quality Act, if the agency is expected to rely upon or take action pursuant to such information. This requirement will apply to all types of advocacy groups, both from industry and environmentalists, thereby creating a level playing field. Thus, the guidelines will ultimately increase regulatory decision makers' confidence in the validity and reliability of the totality of information upon which they are basing their decisions. In addition, the Data Quality Act will instill confidence among the regulated community and other interested stakeholders that agency rules and pronouncements have a rational basis in science, thereby lessening the frequency of administrative and legal challenges.

Finally, and perhaps most significantly, the Data Quality Act marks the first major legislation dealing with federal rulemaking in the past half century that is truly populist in nature. The Act permits the average citizen to participate more easily in the regulatory process by providing a clear avenue for the correction of information that does not meet the standards established pursuant to the Data Quality Act. Broad public involvement further serves to ensure that regulatory decisions based upon scientific and other types of information are sound. The Act also promotes transparency and public accountability.

In light of the importance of the Data Quality Act and its broad applicability to government information beyond regulations, the Center for Regulatory Effectiveness is working with libraries and educational groups to acquaint them with the opportunities afforded under this landmark statute. CRE is also soliciting scholarly research on the Data Quality topic and reporting the same on its website. The Center invites interested parties to visit the CRE website (<http://www.TheCRE.com>) for further information on the Data Quality Act and the Center's efforts in this important area.

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Ogmius Exchange *Chuck Herrick Responds:*

Jim Tozzi argues that the Data Quality Act (DQA) will result in increased public confidence in the scientific information used in the regulatory decision making process. As Mr. Tozzi sees it, the “goal of the Data Quality Act [is] to bring...consistency to the quality of government information by codifying requirements that data used and disseminated by the Federal government...be objective.” He asserts that this will “instill confidence among the regulated community and other interested stakeholders that agency rules...have a rational basis in science, thereby lessening the frequency of administrative and legal challenges.” I cannot share Tozzi’s optimism.

It strikes me that the rationale for DQA rests upon a fundamental misunderstanding concerning the nature of scientific assessment in a policy context. Scientific assessments in a policy context frequently address complex phenomena such as global warming, HIV/AIDS intervention programs for specific ethnic populations, or mixed-use management of resources in National Forests. These issue areas cannot be adequately characterized by means of one or two variables or metrics of concern. Rather they involve the integration of dozens of different data sets, numerous and varied models, and findings from perhaps hundreds of separate studies. The credibility of a policy decision simply does not hinge upon the “objectivity” of discrete units of information. Rather, policy and regulatory regimes are typically based upon a wide variety of informational inputs, some of which are more robust than others. To judge quality, it is essential to step back and consider the entire mosaic, and perhaps misleading to zero-in on a few individual tiles.

The integration of scientific information to support a particular policy or regulatory regime is a challenging proposition, involving both science and judgment. In such a context, it is probably unwise to pre-stipulate absolute measures of acceptable data quality. Rather, the value of a particular data set is determined by its “fitness for use” in a particular situation. It therefore makes far more sense to speak of the suitability of data than its objectivity.

Mr. Tozzi’s organization, the Center for Regulatory Effectiveness (CRE), recently petitioned the United States Global Climate Change Research Program (GCRP) and the Office of Science and Technology Policy to withdraw the first National Assessment on Global Climate Change “because it violates the objectivity...requirements of the Data Quality Act...” (The CRE petition letter can be viewed at http://www.thecre.com/quality/20020211_climate-letter.html) Among other things, CRE asserts that the report was “published without...development of the underlying science.” I find this claim astonishing. Published by Cambridge University Press,

the U.S. National Assessment is a model-based review of alternative future scenarios designed to identify potential vulnerabilities and adaptation strategies. It is meant to enlighten readers regarding how changes in different climate variables may impact future conditions at the regional scale. Its value is heuristic, not prescriptive. In my view, the whole point of exercises such as the National Assessment is to help us consider the co-development of science and policy.

Science is inherently evolutionary, it advances because researchers publish and critique one another’s work. Publication is our most important mode of communication and interaction, and it is only through publication and dissemination of findings and alternative scenarios that meaningful research dialog can occur. Withdrawal of the National Assessment would retard both research and policy deliberation, assuring only an ignorant status quo.

Like scientific research, policy formulation is not a rote, menu-driven activity. Policy formulation is an evolutionary and experimental enterprise. Strictly speaking, it is impossible to predict with certitude how a given community will react to a particular policy intervention. As Emery Roe points out, the policy formulation process is characterized by uncertainty, complexity, and incompleteness. Issues are uncertain when causal processes are unclear or not easily understood. Issues are complex when they are more numerous, varied, or interrelated than previously understood. Issues are incomplete when interrupted, postponed or left otherwise unfulfilled in some important aspect. This lack of epistemic grounding could result in paralysis, but it tends not to. Policy makers muddle through, usually by appealing to theories and operating within administrative frameworks that can accommodate complexity, uncertainty, and incompleteness. This is especially true in the areas such as public health, economic development, and environmental policy where decision makers frequently utilize adaptive policy instruments (such as the petition process) to enable us to learn from experience. The inchoate nature of the policy arena makes the very notion of a priori standards for data objectivity highly problematic. For both science and policy formulation, the best way to root out errors and assure vigorous improvement is through wide-spread publication and dissemination of data and information. The more eyeballs that review the material, the richer the debate, and the more likely we are to end up with rational, effective, and equitable public policies.

If administered in an aggressive, inflexible manner, the Data Quality Act has potential to chill and stultify public debate and enlightened policy development. On the other hand, if OMB is flexible, recognizes the applicability of existing data quality systems, respects the idiosyncratic nature of information use in a

Ogmios Exchange - Chuck Herrick Responds: Continued

policy context, and treats the DQA as guidelines – and not as a codification of immutable rules – then the Act could have positive consequences. In particular, I am optimistic that the DQA emphasis on error correction will help make agencies less

bureaucratic, more open and transparent, and more responsive to citizen input.

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Ogmios News *What's In A Name?*

The name of this newsletter, “Ogmios”, and our description of Ogmios as the “Gallic god of eloquence,” have provoked some discussion. We are grateful to Peter E. Knox, Chair of the University of Colorado Department of Classics, for providing the following information:

“According to a standard work of reference, *Der Neue Pauly Enzyklopädie der Antike*, Ogmios is attested once by Lucian, the “accomplished belletrist and wit” of the Second Sophistic (born ca. 120 CE). In a passage in the “Herakles”, a preface to an unspecified disquisition written late in life, Lucian describes a painting that he saw in southern Gaul, depicting a very old man, balding, wrinkled, and sunburned, looking like a denizen of the Underworld, but wearing an outfit - lion skin, club, and bow - that looks like Herakles'. He is pictured pulling along a crowd of people whose ears are attached to a thread of gold and amber, the end of which is attached to his tongue. Lucian says that a

bystander, who happened to be a Gaul, told him that the painting represented “logos” or “speech” and that since the speech of old men is especially characterized by wisdom, “logos” is depicted as an old man. There is no other reference to, or representation of, Ogmios from antiquity. Did Lucian make him up? Some think so: Lucian was a satirist, not a reporter or ethnographer. Apparently others think that he may really have seen such a picture, but doubt the “explanation” offered by Lucian's unidentified interlocutor. And it does happen to be the case that Lucian himself was an old man when he wrote this.”

Perhaps it is somewhat of a stretch to describe Ogmios as the “Gallic god of eloquence” as some sources have done. Nevertheless, we find the image of an old man pulling along a crowd of people whose ears are attached to his tongue by a thread of gold and amber a colorful description of what we hope to accomplish through Ogmios the newsletter.

Ogmios News *Living with the Genie, March 5-7, 2002*

Seven members of the Center for Science and Technology Policy Research's SPGrads group (http://sciencepolicy.colorado.edu/sp_grads/index.html) attended Columbia University's “Living with the Genie” conference March 5 – 7, 2002. Here are the impressions of two of the students:

As the development of science and technology rapidly continues, it's hard to ignore the question of whether this progress could get out of control. Images of cloned Frankensteins and nuclear Holocausts aside, there is talk among leaders of the scientific, political, and academic communities that the progression of science and technology should be more thoughtful and deliberate, and so more beneficial to society.

This process of trying to manage science and technology was the focus of the “Living with the Genie” conference last March at Columbia University in New York. Eleven University of Colorado students and faculty members, coming from fields as diverse as public policy, journalism, and atmospheric science,

attended the conference. In addition to the conference's innovative design, which imitated real conversation by substituting traditional conference lectures with impromptu panel discussions and small group meetings, the conference's focus on science and technology policy was unique.

“As far as content goes, I found the meeting very stimulating,” said Tara Fortin, a graduate student in chemistry at the University of Colorado, Boulder. “It really got me thinking about personal and institutional responsibility and the sheer complexity of trying to direct the ‘genie’ that is science and technology.”

This “genie” of science and technology is threaded throughout modern society, and so, conference participants said, is something society should learn how to live with and to manage. Proposals for accomplishing that goal varied from establishing legal control for the funding and development of science, to developing technology that is advanced enough to govern itself. Many of the discussions during the three-day conference focused

Ogmius News Continued

on whether there is a problem with science and technology. Panels and working groups covered issues such as the history of science and technology, the best goals for science and technology, and the optimal way to govern scientific and technological progress in the modern world.

Although participants did not reach concrete conclusions, they considered several key ideas. First, science and technology progress is already restrained, typically by funding organizations; second, the development of science and technology is faster and more complex than it has been in the past; and third, this development often evades issues of human values and ethics. "Yes, I want TV. Yes, I want a helicopter. But beyond that, I want tranquility," said Thomas Odhiambo, the founder of the African Academy of Sciences and of the Forum for Science-led Development in Africa, during a panel discussion. "We should be looking at what really makes us human. And what really

makes us human is spirit, and we have forgotten that... It is the spirit that I'd like to bring back to science and technology." Performances of musicians and other artists throughout the conference symbolized this creative human spirit behind scientific and technological discovery.

By the end of "Living with the Genie," most participants had a sense that the conference was only a starting point for redirecting science and technology innovation so it is more beneficial to society. The discussion the conference initiated will continue in the future, and is intended to spark a movement toward developing better guidelines for managing the relationships between science, policy, and technology.

For more information, go to <http://www.livingwiththegenie.org>.

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Ogmius News Center Staff Testify Before Congress

Center staff members were busy this spring sharing their views on science and technology policy matters with members of Congress:

On March 13, 2002, Center Director Roger Pielke Jr. testified before the United States Senate Committee on Environment and Public Works. The subject of his testimony was the economic and environmental risks associated with increasing greenhouse gas emissions. For more information and to download a copy of Roger's remarks, see

http://sciencepolicy.colorado.edu/pielke/rp_senate/13_2002/index.html.

On April 17, 2002, Visiting Scholar Rad Byerly testified before the United States House Science Committee. The subject of Rad's testimony was "New Directions for Climate Research and Technology Initiatives." For more information and to download a copy of Rad's remarks, see

http://sciencepolicy.colorado.edu/homepages/rbyerly/house_testimony_apr_2002/index.html.

Ogmius News Wanted: Next Generation of S&T Policy Leaders

The Center for Science, Policy, & Outcomes (CSPO) announces the "Research Symposium with the Next Generation of Leaders in Science and Technology Policy," to be held in Washington, DC on November 22 and 23, 2002. This conference is a joint project of the American Association for the Advancement of Science (AAAS), the Edward J. Bloustein School of Planning and Public Policy at Rutgers University, and CSPO.

In supporting the newest leaders in science and technology policy, the program committee is accepting proposals for papers from scholars and practitioners who have received their terminal degree no earlier than 1995, as well as those who have completed all degree requirements with the exception of a thesis (ABD or equivalent). Two papers will be chosen to represent

eight themes in science and technology policy, as described in the proposal request. Authors whose proposals are accepted will receive travel funding to attend the workshop and will be given an honorarium of \$750 upon presentation of a completed paper, which will be published in a multi-authored volume from the Symposium.

The Symposium is supported by the National Science Foundation under Grant No. SES-0135170. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation. For more information about the Symposium please visit its web site, <http://www.cspo.org/nextgen/index.html>.

Project News

Global Climate Change and Society (<http://sciencepolicy.colorado.edu/gccs/>)

The second year of the Global Climate Change and Society program begins June 17. Out of 130 applications, thirteen students were offered admission. All thirteen have accepted--the thirteenth student bringing his own funding from Queens University in Ontario. This year's students are a diverse lot--their majors include geology, philosophy, women's studies, physics, biology, environmental policy, meteorology, and English.

Over an eight-week period these students will explore the nature of scientific knowledge--its epistemological character, and its social and philosophic implications--and the contribution that social scientific and humanistic perspectives play in public policy debates through an examination of the issues surrounding the computer modeling of global climate change.

GCCS is a summer research program for undergraduates sponsored by the National Science Foundation (<http://www.nsf.gov/>).

Western Water Assessment (<http://sciencepolicy.colorado.edu/wwa/>)

A primary goal of the Western Water Assessment project is to understand societal sensitivity to climate extremes. We are interested in the combined impacts of climate variability and regional growth on water resources. Most of the WWA research effort on this topic has been devoted to the development and application of an integrated assessment model to assess the potential for water shortages in cities and agriculture, and also the potential for insufficient water for environmental needs.

The 2002 drought provides us with an opportunity to observe the actual impacts of drought on regional water resources. A suite of activities are planned, including an assessment of the environmental impacts of the drought and of the effectiveness of water restrictions and water conservation programs in various towns and cities, and a case study that uses the drought to learn more about water transfers. These activities will provide important data to validate future modeling activities.

Jobs

Professional Research Assistant in Hydro-Climatology

The Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado at Boulder has an immediate opening for a Professional Research Assistant at the CIRES Center for Science and Technology Policy Research. This position will support research in developing experimental techniques to predict streamflow.

Duties

The qualified individual will assist in:

- Statistical downscaling of numerical weather prediction output to local scales
- Configuring and running a suite of hydrologic models in river basins throughout the contiguous USA
- Evaluation/validation of experimental forecasts
- Discussion of experimental forecast products with reservoir managers
- Preparing scientific publications and presentations.

Requirements

- Excellent computational skills (Fortran in a UNIX environment; knowledge of Java is a plus).
- Experience with both statistical methods and modeling

approaches in surface-water hydrology.

- Experience with mapping and graphical packages (e.g., GrADS, IDL, ArcInfo).
- Good oral and written communication skills.
- BS or MS in meteorology, hydrology, computer science, or a related discipline.

For further information about this position, please contact Dr. Martyn Clark (e-mail: clark@vorticity.Colorado.EDU).

The position will be filled as a Professional Research Assistant at the University of Colorado, and will be eligible for employee benefits, including 22 days of vacation per year. The review of applications will start immediately and continue until the position is filled.

To apply, mail or fax (303.492.1149), or email Jobs@cires.colorado.edu resume, salary history and a list of three references to:

CIRES Human Resources
Job Code PL-1
216 UCB
Boulder, CO 80309-0216

Jobs

The 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.

A new fall 2002 program session has been added—expanding the program beyond its current summer and winter sessions. The fall 2002 program will take place from September 9 until November 27, 2002.

To apply, candidates should submit an application and request their mentor fill out a reference form. Both are available at <http://national-academies.org/internship>. **The deadline for the September Program is June 1, and for the January Program is November 1.** Additional details about the program and how to join our mailing list are also available on the Web site. Questions should be directed to: internship@nas.edu.

Here is what four former interns said about the program:

"This is an important career building opportunity for people

interested in the scientific community outside academia. Even if you plan to pursue a traditional academic track, seeing science from a policy perspective is very enlightening. There is something valuable in this experience for first year grad students to recent PhD's. Come with an open mind and expect to learn more than you bargained for."

"The National Academies Internship has been one of the most valuable life experiences I have had thus far. The scope of the influence of the Academies in helping shape science, medical and engineering related policy is amazing to witness. Through this internship, I have learned more about my work as a social scientist than I imagined, and I have a better sense of how my research can relate to public policy."

"The Internship program provides an exceptional opportunity for scientists to explore various facets of scholarly research and policymaking. As an intern, you will work with an eclectic mix of highly educated, diverse intellectuals who help advance the future of science. You will leave not only armed with important and influential contacts but also with invaluable skills and experiences."

"This program will open your mind to a world rarely envisioned from the confines of laboratory bench work. I learned an immeasurable amount about the policy and politics behind science and after the internship opens your mind, it opens career doors."

Upcoming Events

Water Conference Features Free Sessions

The Natural Resources Law Center at the University of Colorado (Boulder) hosts its 23rd annual conference, "Allocating and Managing Water for a Sustainable Future: Lessons from Around the World" on June 11-14. Tuesday, June 11 sessions are free and open to the public, including an opening plenary panel and the evening's keynote address. **There is no charge to attend the Tuesday Events, but pre-registration is appreciated.**

Patricia Wouters, director of the International Water Law Research Institute at the University of Dundee, Scotland, leads a panel discussion beginning at 8:30 a.m., "Global Water Issues: Reconciling Values and Realities in the Developed and Developing World," followed by concurrent sessions of contributed papers from international scholars and experts. Focus areas are: transboundary and transbasin management;

market mechanisms and modeling; management strategies, from local institutions to national plans; and balancing water for people and the environment. Luncheon speaker David Hayes (Latham & Watkins, Washington, DC) will speak on "Federal-State Decisionmaking on Water." The evening keynote address by Peter Gleick of the Pacific Institute for Studies in Development, Environment and Security (Oakland, CA) sets the stage for the remainder of the conference: "Overview of Global Water Issues and Challenges."

For a complete agenda, please click on <http://www.colorado.edu/Law/NRLC/2002Conference.html>. To register for the free sessions and/or the full conference, contact jpatton@spot.colorado.edu or phone 303.492.1288. Note that the early registration deadline (of May 10) has been extended until the end of the month.

Recent Publications

Roger Pielke's article, "Science policy: Policy, politics and perspective," appeared in the March 28, 2002 edition of Nature (http://www.nature.com/cgi-taf/DynaPage.taf?file=/nature/journal/v416/n6879/full/416367a_fs.html). The article has been quoted in the San Francisco Chronicle (<http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2002/04/01/MN13668.DTL>).

Bob Frodeman's article, "Undergraduates Study Climate Change

Science, Philosophy, and Public Policy," appeared in the January 15, 2002 issue of EOS (<http://sciencepolicy.colorado.edu/gccs/article.pdf>)

Martyn Clark's article (with F. Lo), "Relationships Between Spring Snow Mass and Summer Precipitation in the Southwestern USA Associated with the North American Monsoon System," appeared in Journal of Climate, vol. 15, n. 11, pp. 1378-1385 (2002).

SPGrads

The Center for Science and Technology Policy Research hosts an interdisciplinary group of graduate students and early career scientists interested in science and technology policy issues known as "SPGrads." SPGrads meets approximately once a month to hear talks by experts in the science and technology policy field, and to discuss issues of concern to the participants. Over the past several months, SPGrads has had an impressive line-up of speakers: on December 14, Rad Byerly, Center Visiting Scholar and former Chief of Staff of the House Committee on Science and Technology, described the federal budget process for scientists; on January 23, Hunter Lovins of the Rocky Mountain Institute discussed the concept of natural capitalism; on March 8, Doug

Kenney of the University of Colorado's Natural Resources Law Center presented a talk entitled "Water Resources Decision-Making in Colorado in the Face of Growth and Climate Change;" and on April 26, Professor William Lewis of the University of Colorado (and also the chair of the National Academy of Sciences Committee on Endangered and Threatened Fishes in the Klamath River Basin) gave a talk on "Policy, Politics, Law, and Science: Elements in the Fate of Endangered Fishes of the Klamath River Basin." The Center also sponsors a listserv and website for SPGrads which includes an extensive list of links to jobs around the world. Click here (http://sciencepolicy.colorado.edu/sp_grads/index.html) to visit the SPGrads site.

About Us

Ogmios is the newsletter of the Center for Science and Technology Policy Research to be 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.

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