



Zambia Red Cross employees participate in a climate meet-up. Photo: Bettina Koelle.

## OGMIUS EXCHANGE

CSTPR'S Red Cross/Red Crescent Climate Centre Internship Program (<http://sciencepolicy.colorado.edu/students/redcross>) is featured in this issue of Ogmius. Now in its second year, the program seeks to improve climate change communication and adaptation decision-making in response to climate variability and change within the humanitarian sector. It connects humanitarian practitioners from the Red Cross/Red Crescent Climate Centre, an affiliate of the International Federation of Red Cross and Red Crescent Societies, with science-policy graduate student researchers at the University of Colorado through placements in IFRC regional field offices in Southern and East Africa for approximately 3 months each summer. Leslie Dodson and Drew Zachary, the 2014 interns, discuss their internships below.

The first article is authored by Leslie Dodson. Leslie recently received a Ph.D. in Technology, Media & Society from

the University of Colorado Boulder. Her research involves the design of a communications system for the largest fog water harvesting project in North Africa which will serve hundreds of rural Berber residents in southwest Morocco. Prior to pursuing a Ph.D., Leslie was a senior foreign correspondent for CNBC, MSNBC, NHK-Tokyo and Reuters. Over the course of her 25-year journalism career, she specialized in reporting on climate change, global environmental issues, international development and emerging market economics. Leslie has a Master's Degree in Journalism from Northwestern University; a Certificate in Conservation Biology from the Center for Environmental Research and Conservation at the Earth Institute, Columbia University; and a Certificate in Permaculture Design. Leslie presented a Ted Talk, "Don't Misrepresent Africa," focusing on negative stereotypes and media coverage of the Continent.

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<http://sciencepolicy.colorado.edu/ogmius>

# Promoting Climate Understanding and Adaptation: A Role for Serious Games and Effective Communication Technology

by Leslie Dodson

I had the opportunity to join the Red Cross/Red Crescent Climate Centre this summer working with the Zambia Red Cross Society and with a partner organization, Indigo, in South Africa studying how 'serious' games promote better mid-to-long term decisions regarding climate change adaptation and disaster risk reduction in sub-Saharan Africa. The Climate Centre serves as a research and resource base for the Red Cross/Red Crescent on climate change and disaster risk reduction. Zambia has been a focus area for the Climate Centre because it faces a host of climate change-related challenges that will likely affect the nation's already vulnerable agriculture, forestry, health, water and energy sectors.

In order to help a range of humanitarian stakeholders – policymakers, aid workers, scientists and community members – better understand and grapple with climate uncertainty and climate-related challenges, the Climate Centre has created more than 40 participatory, group-style games. The games, all of which involve a facilitator, stimulate players to become better informed about adaptation by enabling players to "inhabit" the reality of climate-risk management in a captivating and fun way. Some games focus on building team spirit and developing better communication channels, others challenge players to incorporate or respond to increasingly complex circumstances involving climate change and risk reduction. The games are flexible enough to suit a variety of adaptation and disaster risk reduction scenarios. For example, one game might focus on food security, another might educate players on interpreting and acting on climate information, and another might focus on disaster communication and response. The ultimate goal of the games is to help players make better decisions now in order to prepare for climate-related risks and opportunities in the future.



*The Kasaya Satellite Disaster Management Committee of the Zambia Red Cross.  
Photo: Mr. Obbey.*

While in Zambia, I joined in on two Climate Centre and Future Climate for Africa workshops featuring climate games and experiential learning for climate adaptation. (The FCFA initiative is funded by the UK Department for International Development.) The workshops, one in Livingstone and one in Lusaka, sought to elevate forecast-based information into planning and decision-making for Zambia's future. Red Cross/Red Crescent colleagues from around Zambia, along with regional meteorologists, development practitioners, policymakers and journalists participated in game sessions where they anticipated future development scenarios in Zambia that might be affected by a changing climate. Zambia, for instance, will likely face increased rainfall, changes in flood patterns and longer droughts that will affect infrastructure and public works projects such as roads and dams as well as cause shifts in disease patterns or alterations in dietary habits. The serious games helped players understand these complex climate-related relationships.

Part of my work involved videotaping serious game activities in order to produce a series of instructional videos to train game facilitators. I collected video and interviews from gameplay at the Zambia workshops and from a rural community near Nieuwoudtville, South Africa where I traveled to work with the



Playing climate games at the Future Climate for Africa workshop in Lusaka. Photo: B. Koelle.

Indigo development and change NGO (<http://www.indigo-dc.org>). Indigo specializes in participatory climate change adaptation projects with marginalized local communities, many of which involve the use of climate-related games designed by Indigo's director, Bettina Koelle.

In addition to studying how climate-related games can help stakeholders make better decisions about future climate risks and opportunities, I also spent time investigating communication networks and data collection techniques along the Zambezi River basin. My PhD research in Information and Communication Technology for Development (ICTD) at the ATLAS Institute prepared me to conduct a technology assessment of mobile phone use and network availability that can assist the Zambia Red Cross Society in improving early warning and flood preparedness communication in the area. Specifically, I worked with the Zambia Red Cross project analyst from Kazungula to investigate how mobile phones might be used to get flood-related observations and data transmitted to and from affected stakeholders. I also interviewed members of the Satellite Disaster Management Committee of the Zambia Red Cross in Kasaya, who recounted the myriad communication challenges they face including a *lack of data* such as intra-day rainfall data or wind maps that would help them prepare for weather events. They are also challenged by a *lack of access* to existing information, exacerbated by insufficient communication technology. And then there's the persistent *disconnect* between climate

models provided by scientists and forecasters and the needs of information consumers such as rural farmers who want practical, actionable information.

This Red Cross/Red Crescent research opportunity was an invaluable experience on many levels. I discovered the incredible potential the climate games have to help stakeholders develop skills to make better long-range plans, become informed about humanitarian issues, make wise choices and integrate science into decisions. I also saw firsthand how immersive, purpose-driven and playful activities encourage better decision-making. Furthermore, I came away with a greater understanding of how challenging it is to convey climate information and forecasts.

It may seem that games and technology networks have little in common, but through this Red Cross/Red Crescent internship I saw how low-tech serious games and high-tech communication networks both contribute to better communication and understanding of climate risks and opportunities.



Leslie Dodson  
[leslie.dodson@colorado.edu](mailto:leslie.dodson@colorado.edu)

The second article is by Drew Zackary, a Ph.D. student in cultural Anthropology at CU Boulder. Drew received an M.A. in Anthropology from UC Denver and a Bachelor of Sciences in Psychology from Colorado State University. Drew's current interest is how climate change, livelihoods, conservation and culture interact at the local level. His Master's thesis investigated ranching livelihoods outside of Yellowstone National Park after wolf re-introduction. Previously he has used sustainable livelihoods household assessment models to work in teams

investigating agriculture in Ecuador. Drew is additionally interested in how human decision making is constrained by climate change and livelihood options are shaped by sociocultural contexts. One important component of applied scholarship is forging alliances across disciplinary boundaries. Currently, Drew is interested in how practitioners from national governments, non-profits and the natural sciences can work with cultural anthropologists on problem centered program design.

## Climate Change Adaptation: Early-Warning Forecasting in Northern Uganda - Summer 2014

### by Drew Zackary

This summer I was one of the Red Cross/ Red Crescent Climate Centre interns. I worked with the Partners for Resilience NGO consortium in Uganda building case studies on climate change resilience in rural communities and investigating the Early Warning Early Action forecasting system. Recently, NGOs have begun to focus on how to help communities adapt to future conditions that climate change will bring. By pre-emptively working development projects into the fabric of climate change forecasts and emergency preparedness the hope is to build more resilient communities. Rural communities are most vulnerable to disasters and livelihood insecurity. In Northern Uganda there will be an increase in flood risk as well as a shifting in the rain seasons.

The majority of people in northern Uganda are rain fed agriculturalists, pastoralists or a mixture of both. With little in the way of machinery, fertilizers or irrigation most farming families rely on traditional methods of cultivation and weather forecasting. As seasons shift, dry seasons lengthen and rainfall collects into smaller timeframes, leading to increased chances of waterlogging and floods. Partners for Resilience are working on tools to help local communities adapt and act in ways that can make their lives more resilient in the face of these climactic changes. One of those tools is the Early Warning/Early Action system.

One of my tasks this summer was investigating the ways in which PFR's Early Warning/Early Action (EW/EA) system is being used by local communities to take disaster risk reducing actions to increase resilience. The PFR partners in each project area facilitate the EW/EA system. Basically, the philosophy behind EW/EA is to get reliable forecast information to local people, institutions, and aid structures *before* a disaster occurs, thus lowering the morbidity and mortality of these events. As the PFR partner Red Cross states in one of its guiding



*Drew Zackary in Karimoja. Photo: Emmanuel Akol*

documents, EW/EA means; "Routinely taking humanitarian action *before* a disaster or health emergency happens, making full use of scientific information on all timescales."

The PFR partners in both Otuke and Napak were using an EW/EA "matrix" to integrate traditional forecasting knowledge with scientific forecasts. The matrix is filled in during focus groups in the project communities. When the scientific forecast is given to communities, at 3-month intervals, the matrix is then used to discuss decisions and actions to be taken. Here is an example of the matrix being deployed:

Scientific Information	Traditional Information	Sector	Possible Impact	No-Regret Action	Resources Required	Responsible Person
Wet season with increased rain	Appearance of birds: Arum, Ibanga	Agriculture	Water logging of gardens, destruction of crops	Establish water catchments, tarps for vegetables	Funds, tauralpins, garden tools	Households, community, NGO's

*EW/EA Matrix for Amunga Parish-Olilim sub-county. 2012*



*Red Cross/Red Crescent Climate Centre Intern Drew Zackary in Otuke. Photo: Jasper Odwall.*

Due to many different incidents and complications the dissemination of the forecasts to the communities I worked in all summer never occurred for that 3 month period. This was mainly due to the delay from the central Ugandan governmental ministries. At any rate, I was able then to find out how forecasting occurred and affected decision making during the 3 month period in the absence of PfR facilitation. I spent much of my time listening to people about what programs, such as goats or banana cuttings, were working best. I also continued to gather traditional categories of weather patterns and seasonal predictions.

My first stop was the remote village of Otuke in the Lango sub-region. Northern Uganda has a complicated and often tragic history. The people who live here in the Lango sub-region, mainly the Langi, have experienced marginalization and violence since the colonial era. Most recently the Lords Resistance Army led by Kony pushed people into IDP (Internally Displaced Persons) camps and destabilized the region for a generation. It is only since 2007 that this area has been secure. With multiple initiatives from the Ugandan government, World Bank, USAID, DFID (British government AID) and multiple NGOs, humanitarian development and governance work has shifted into high gear. The people who live in Otuke district are working hard at reclaiming traditional lands and developing infrastructure, effective governance, and resilient livelihoods. The Partners for Resilience project has worked very hard on developing hazard maps and early

warning systems in the parishes of Otuke. (A parish is the smallest unit of governance in Uganda.)

The passing on of traditional knowledge of agricultural practices, forecasting and land boundaries combined with climate change aware practices and new knowledge about risk reduction is essential for producing resilient communities. It is here that resilience is more than a proxy for hope. The Langi of Otuke have been resilient in the face of near cultural elimination. The farmers ask, not for handouts, but as Langi farmer Peter Otim said to me, "We need more training, we need more knowledge." Resilience is work, from the ground up.

The use of effective Early Warning/Early Action systems here is increasingly becoming a reality. PfR have facilitated the dissemination of quarterly (3 month) forecasts directly to the local people in Otuke and Irriri (Napak). In the past, officials rarely broadcast anything more than daily forecasts. PfR has worked with the meteorologist in Lira to take a Langi translated forecast to the district for dissemination. With this system trust is building. While many farmers said that they only used traditional forecasting, a few said that they used a combination of methods now that the information is given to them in a local language directly. In the coming year a new weather station in the district headquarters will be fully operational. There is hope that a streamlined system and newly hired technocrats will be able to get forecasts to farmers quickly before planting season's start.

My second fieldsite was in Karamoja, in the Napak district. Here the ecosystem and socio-cultural contexts are very different from Otuke. The Karamojong are mainly pastoralists, with increasing numbers of agriculturalists and agro-pastoralists. The language and social structures differed widely from the Langi people. One thing remained certain, though: climate change will affect their livelihoods in detrimental ways unless clear forecasting information and sustainable and resilient practices adapt to the shifts.

To investigate the traditional forecast systems I carried a sheet of paper with the translated matrix with me into the field, as well as copies of the older ones at each fieldsite, Otuke and Napak. The original stayed with the local community leader. I interviewed people about traditional weather and seasonal forecasting signs to figure out how they made decisions based on this matrix and how they used the scientific forecast. I would then follow up and ask about the actions taken based on the forecast. Like most research agendas, I got pleasantly stuck on the first steps. Multiple names for similar phenomena abounded. Birds, I found, had two names at times. There were disagreements between people in interviews about how much time before or after a season certain events occurred, such as the flowering of a species of tree. On top of this, there was no English equivalent for many animal and plant names. I made an attempt to triangulate solutions using dictionaries, follow up interviews with priests and cultural leaders about categories and attending innumerable “sensitization” events about many topics the entire summer.

I ended up with so much data it was difficult to decide what was interesting and useful. For some the seasonal charts and remade matrix may seem peripheral to getting food and clean water to a disaster area. But I found the local PfR staff intensely interested in our discussions, and very happy to constantly “school me” in the ways that adaptation is a long-term battle that both academic interns and practitioners can fight together.

One of the biggest battles for graduate internships is efficacy versus intellectual enrichment. NGOs often privilege technocratic knowledge. PfR are actively utilizing community based adaptation ideas and workshops to negotiate a new way of building resilience. It has the potential to move beyond tired quantifiable measurements of binary success/failure of inputs and outputs. This requires a lot of patience and listening between communities, researchers,



*Red Cross/Red Crescent Climate Centre Intern Drew Zackary in Karimoja.  
Photo: John Bosoce.*

technocrats, politicians and others. The intern is pushing his/her knowledge base in order to form new questions and ideas based on the holistic picture emerging in development and climate change governance. The coming shifts in climate will only highlight the creaky epistemological breaks between concepts of humanitarianism, sustainable development, climate adaptation and those ideas that work within critical circles of thought. It was to my delight that the PfR internship showed me how ground-level, community organized programs can be integrated horizontally to increase resilience in previously marginalized areas. Climate governance has ways of integrating indigenous rights and democracy. It just takes an insane amount of work.

The greatest gift an intense summer like this offers is the opportunity to constantly be out of one’s element, to be forced into mental silence and listen to those people who will need empathetic collaborators able to facilitate co-production of knowledge. Most of all, I learned that the peasants, so easily forgotten in our larger political battles in the US, deserve equal footing in development in the coming century of dynamic and dangerous shifts in our shared ecology. PfR is a program that showcases one way of accomplishing this. That’s no small feat, and I am glad to have witnessed it. Even if that meant struggling to learn about rare species of birds and how goats are given to friends.



Drew Zackary  
[burditt.zackary@colorado.edu](mailto:burditt.zackary@colorado.edu)

# RESEARCH HIGHLIGHT

Our Research Highlight focuses on a study conducted by CSTPR's Max Boykoff along with Adriana Raudzens Bailey and Lorine Giangola that examined the use of "hedging" language - language that conveys uncertainty - when journalists reported on assessment reports of the Intergovernmental Panel on Climate Change (IPCC). Max is an Associate Professor in the Center for Science and Technology Policy Research, which is part of the Cooperative Institute for Research in Environmental Sciences at the University of Colorado Boulder. He teaches in the Environmental Studies program and is adjunct faculty in the Geography Department. He holds a Ph.D. in Environmental Studies from the University of California-Santa Cruz and Bachelor of Sciences in Psychology from The Ohio State University. Lorine is a Ph.D. graduate of CU-Boulder's Environmental Studies program, with a focus in natural resource conservation management and policy. Her dissertation "The cost of cleaner water: Linking farmer incentives to conservation outcomes" developed an interdisciplinary method for estimating the costs of achieving certain water quality improvements in agricultural watersheds. Lorine is currently the STEM Coordinator and NSF-CIRTL Coordinator with the University of Colorado Boulder's Graduate Teacher Program, and she works across campus with STEM graduate students and postdocs to build their skills in teaching science and communicating their research with general audiences. Adriana is a Ph.D. candidate in Atmospheric and Oceanic Sciences at the University of Colorado Boulder. Her dissertation research uses stable isotopes in vapor to distinguish important water cycle processes in the lower atmosphere. Previously Adriana served as the principal media officer for the Cooperative Institute for Research in Environmental Sciences. She's enjoyed combining her dissertation research skills and past experience with science journalism to investigate how newspapers communicate and construct climate change uncertainties.

Their paper has been widely reported in the media including the Boulder Weekly, Daily Camera, Summit County Citizen's Voice, Star Tribune, Aljazeera, Science Daily and Mother Jones.



## Is Climate Journalism Becoming More Cautious? Maybe So

A University of Colorado Boulder research team led by CIRES doctoral student Adriana Bailey, with CSTPR's Max Boykoff and ENVIS Ph.D. graduate Lorine Giangola - examined the "hedging" language - language that conveys uncertainty - used by journalists when reporting on the Intergovernmental Panel on Climate Change (IPCC) assessment reports. The team found that newspapers increased their use of hedging language over time, even though scientific consensus about climate change and its causes has strengthened.

The team tracked "epistemic markers" in four major newspapers - the *New York Times* and *Wall Street Journal* from the U.S., and *El País* and *El Mundo* from Spain - in 2001 and 2007, the years in which the IPCC released its third and fourth assessment reports. Their analysis focused on articles about the IPCC and about the physical science of climate change, but did not evaluate news reports about the potential responses to climate change.



Epistemic markers included any words or expressions that suggest room for doubt about the physical science of climate change, the scientific quality of the IPCC assessment reports, or the credibility of the panel. The research team counted words like *speculative*, *believe*, *controversial*, *possible*, *projecting*, *almost*, and *largely*, and modal verbs like *could*.

## RESEARCH HIGHLIGHT

They argued that the context in which these words appeared was also important. For example, the word *uncertainty* was marked as epistemic in the phrase "...substantial uncertainty still clouds projections of important impacts..." but it was not counted in the phrase "...uncertainty was removed as to whether humans had anything to do with climate change..." Both phrases appeared at different times in the *New York Times*.

The U.S. newspapers used more hedging words than the Spanish newspapers in both years. In the 2001 articles, they counted 189 epistemic markers per 10,000 words in the U.S. newspapers, and 107 in the Spanish newspapers. In 2007, the density of epistemic markers increased to 267 in the two U.S. newspapers and to 136 in the Spanish newspapers.

While the difference between the two countries was not surprising, given the divergent approaches that the U.S. and Spain have taken toward developing national climate policies, the researchers nonetheless did not expect to find an increase in hedging language over time. Though the study did not investigate why journalists started using more hedging language in climate reporting, the team identified multiple potential influences, including increased politicization of climate change and its impacts on journalism and public discourse, and the reporting of more detailed scientific findings and uncertainties.

The researchers also found that reporters construct additional uncertainty by highlighting *changes* and *surprises* - describing differences between IPCC assessments or between scientific predictions and observations - without providing sufficient explanatory context as to why they occur.

By identifying journalistic trends that construct uncertainty in climate science reporting, the study highlights

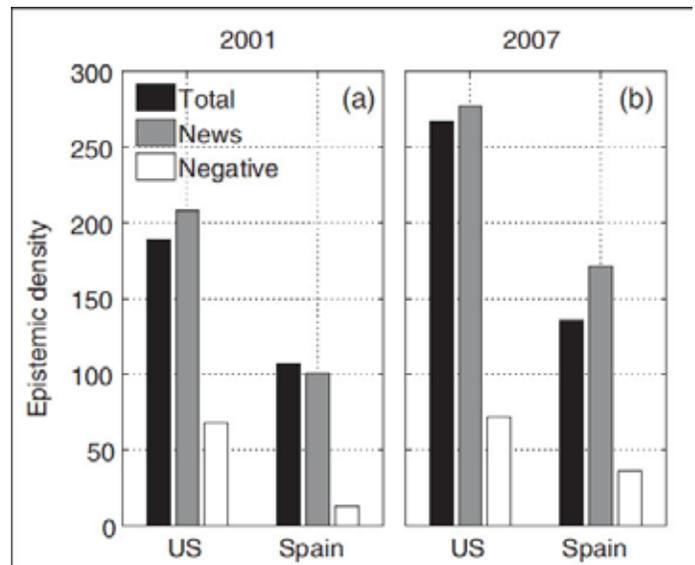


Figure above: The epistemic density (number of epistemic markers per 10,000 reported words) of all news and opinion articles (black), the epistemic density of news articles alone (gray), and the density of epistemic markers with negative tone (white) differentiated by country for both 2001(a) and 2007(b) (Bailey et al. 2014).

linguistic patterns that can subtly shape climate science communications and help guide future discourse on climate science in the media.

An article from the project was published in the journal *Environmental Communication* in Spring 2014: <http://www.tandfonline.com/eprint/Ulcefrq3FqfcVt8pEeAf/full>. A related book chapter will appear in the Spanish text *Periodistas, medios de comunicación y cambio climático* in Winter 2015.

Lorine Giangola  
[giangola@colorado.edu](mailto:giangola@colorado.edu)

## CENTER NEWS

### Lisa Dilling New Director of Western Water Assessment

Lisa Dilling, assistant professor of Environmental Studies, Fellow of the Cooperative Institute for Research in Environmental Sciences (CIRES), and member of CIRES' Center for Science and Technology Policy Research at the University of Colorado Boulder, was recently named director of the Western Water Assessment (WWA) (<http://wwa.colorado.edu>), an applied research program at CU-Boulder that addresses societal vulnerabilities related to climate, particularly in the area of water resources. WWA is funded primarily by NOAA's Regional Integrated



Sciences and Assessments Program (<http://cpo.noaa.gov/ClimatePrograms/ClimateandSocietalInteractions/RISAProgram.aspx>).

Dilling's research focuses on decision making, the use of information and science policies related to climate change, adaptation, geoengineering and carbon management. Her current projects examine drought in urban water systems, water governance and climate change, municipal adaptation to hazards, decision making in public lands management, and knowledge for adaptation in Tanzania. Dilling has authored numerous articles and is a co-editor of the book *Creating a Climate for Change: Communicating climate change and facilitating social change* from Cambridge University Press.

## CENTER NEWS

### Roger Pielke, Jr., Participates in International Conference on Science Advice to Governments

CSTPR director Roger Pielke, Jr., was an invited participant at the "Science Advice to Governments" conference in Auckland, NZ August 28-29. The 200 participants at the conference included science advisors, senior officials, representatives of national academies, experts and scholars from more than 40 countries across the world. Roger participated in a panel titled "Science Advice in the context of opposing political/ideological positions." His article for *The Guardian*, "Government science advice: Where are the honest brokers?" (<http://www.theguardian.com/science/political-science/2014/aug/26/government-science-advice-honest-brokers>), which came out concurrently with his attendance at the conference, argues that "strengthening science advice depends upon a willingness by at least some of our scientific and political leaders to focus more of their attention on the integrity of advisory processes, rather than the hot political issues of the day."



### Center Poster Presentations at CIRES Rendezvous May 2

Center staff and students presented 4 posters at the annual CIRES Rendezvous on May 2 highlighting active areas of research at the Center:

*Mapping Climate Communication* by Dr. Joanna Boehnert, Center for Science and Technology Policy Research

*Cooking Up Clean Air: Demand for Improved Cookstoves and Implications for Air Quality and Health in Ghana* by Katherine Dickinson (1,2), Christine Wiedinmyer (2), Mary Hayden (2), Andrew Monaghan (2), Mike Hannigan (3), Vanja Dukic (4), Abraham Oduro (5), Ernest Kanyomse (5)



(1) CIRES Center for Science and Technology Policy Research, (2) National Center for Atmospheric Research, (3) CU-Boulder Engineering, (4) CU-Boulder Applied Math, (5) Navrongo Health Research Centre

*Risk Perceptions, Management Regimes, and Wildfire Mitigation Behavior in Wildland-Urban Interface Zones: A Cross-Case Analysis* by Elizabeth Koebele (1,2), Deserai A. Crow (1,2), Lydia Dixon (1,2), Adrienne Kroepsch (2), Rebecca Schild (1,2), and Katherine Clifford (2)

(1) Center for Science and Technology Policy Research, (2) Environmental Studies Program

*The Inevitability of and Responsibility for Catastrophic Sea Level Rise* by Jordan Kincaid, Center for Science and Technology Policy Research

## GRADUATE STUDENT & ALUMNI NEWS

### Examining Processes of Knowledge Co-production for Climate Adaptation in East Africa

CSTPR graduate student Meaghan Daly, along with Lisa Dilling (CSTPR/ENVS), Mara Goldman (Geography), and Eric Lovell (Geog), received a National Science Foundation award to study the role of indigenous climate knowledge in climate change adaptation. This research aims to understand how knowledge is produced and incorporated by actors across scales and with varying epistemologies, and to understand how power and the processes of co-production affect the salience, credibility and legitimacy of knowledge. The project will utilize a mixed-method case study design, which will incorporate multiple embedded units of analysis



situated at 3 different institutional scales in Tanzania, East Africa.

### Center Alum Shali Mohleji Talk on How Scientists Can Engage in the Policy Process

Shali Mohleji (Ph.D., ENVS, 2011), who worked with Roger Pielke, Jr., at CSTPR and is now a senior policy fellow with the American Meteorological Society, spoke at CIRES on June 19 about some of the nuances in connecting science to society and the sensitivities at the intersection of science and policy. Shali also described different paths through which scientists can engage in the policy process and how to navigate such engagement responsibly and effectively.

### Marilyn Averill Talk

Marilyn gave a talk at the International Political Science Association World Congress in Montreal titled "Protecting Rights through Climate Litigation."

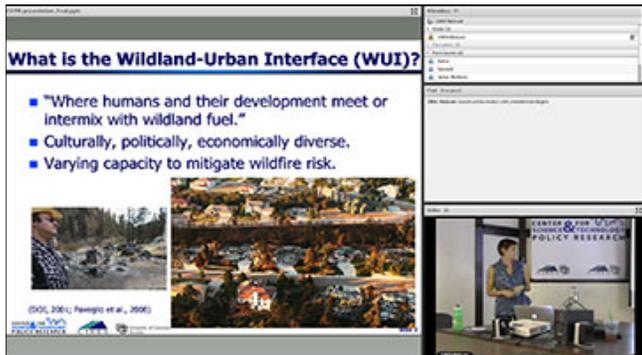
# CENTER EVENTS

Our fall 2014 noontime seminar features several exciting talks about science policy-relevant topics. All talks are free and open to the public and will be held at 12:15 pm the CSTPR conference room unless otherwise noted, as well as available via live webcast. Join our mailing list to receive notification of upcoming talks and a link to the webcast by entering your email under "Join our Mailing List" on the left



hand column at <http://sciencepolicy.colorado.edu>. Webcasts from past seminars can be viewed here: <http://sciencepolicy.colorado.edu/news/webinars>.

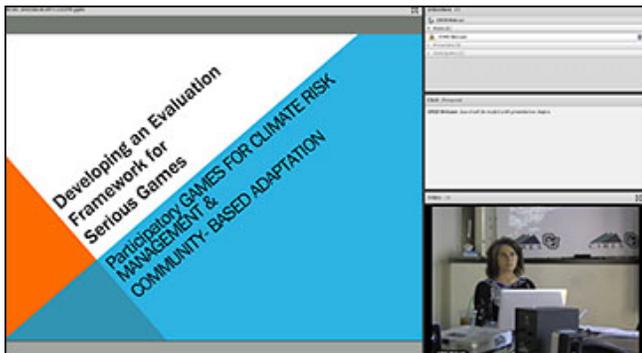
**September 29**  
**Assessing Wildfire Mitigation Outreach Strategies in the Wildland-Urban Interface**



Deserai Crow, Center for Science and Technology Policy Research and Environmental Studies, University of Colorado Boulder

Adrienne Kroepsch, Elizabeth Koebele, and Lydia Dixon, Environmental Studies, University of Colorado Boulder

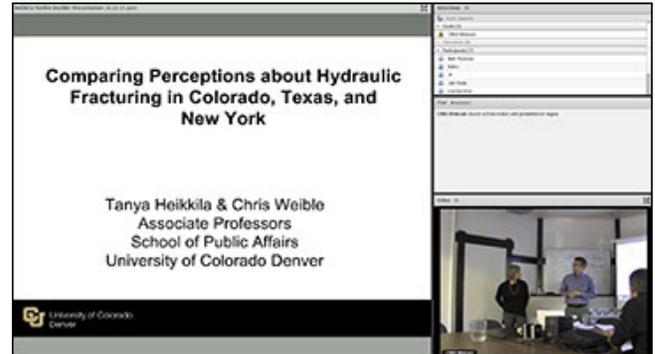
**October 6**  
**Red Cross/Red Crescent Climate Centre Internship Program Summer 2014 Panel Discussion**



Leslie Dodson, ATLAS Institute, College of Engineering and Applied Science, University of Colorado Boulder

Drew Zackary, Anthropology, University of Colorado Boulder

**October 13**  
**Mapping the Political Landscape of Hydraulic Fracturing in Colorado**



Tanya Heikkila and Chris Weible, Associate Professors, School of Public Affairs, University of Colorado Denver

**October 22 at 12:00 PM**  
 (\*Please note that this talk will start at 12:00 pm)  
**The Argument for Changing the Electric Utility Business Model**

Heather Bailey, Energy Strategy and Electric Utility Development, City of Boulder

**October 27**  
**Is This (Our) Risk? The Science and Politics of Catastrophe Insurance**

Jessica Weinkle, Center for Science and Technology Policy Research, University of Colorado Boulder

**November 3**  
**Blind Spots: Electronics Firms, and the Social and Environmental Harms of the Electronics Commodity Chain**

Lucy McAllister, Environmental Studies, University of Colorado Boulder

**November 10**  
**Let's Hear from the People: A Study on Media Impact on Climate Protection and Climate Adaptation**

Gesa Luedecke, Faculty of Sustainability Sciences, Leuphana University, Luneberg, Germany

**November 17**  
**Climate Smart Agriculture in Asia: Measurements, Implementation Strategy and Challenges**

Kritee Kritee, Senior Scientist, International Climate, Environmental Defense Fund

# CENTER PUBLICATIONS

Below is just a sample of the many recent publications by CSTPR authors (CSTPR authors in bold).

## How Grammatical Choice Shapes Media Representations of Climate (Un)certainty

by Adriana Bailey, Lorine Giangola and **Max Boykoff**

*Environmental Communication*, Volume 8, No. 2, April 2, 2014.

See *Research Highlight* above for description.



## What Do Stakeholders Need To Manage for Climate Change and Variability?

by **Lisa Dilling** and **John Berggren**

*Regional Environmental Change*, August 18, 2014

Resource managers and governments at all scales are becoming more aware of the challenges and opportunities that climate change and variability pose for their operational goals. At the same time, providers of climate information are learning that simply creating and disseminating information without context does not necessarily serve the needs of decision makers. As a result, calls for new ways of supporting decision making and supplying information abound. Many of these calls suggest that much more consultation with stakeholders is necessary in order to effectively serve their needs and provide usable information. While this is undoubtedly true, there is also in many cases an existing wealth of experience understanding needs of stakeholders that could be assessed before additional interaction is warranted. The goal of this study was to produce a baseline of stakeholder needs with respect to climate-related decision making from existing documents in three interior western states in the USA to examine patterns of needs and avoid stakeholder fatigue. Read more: [http://sciencepolicy.colorado.edu/admin/publication\\_files/2014.21.pdf](http://sciencepolicy.colorado.edu/admin/publication_files/2014.21.pdf).



## Wolf Reintroduction: Ecological Management and the Substitution Problem

by Adam Pérou Hermans, Alexander Lee, Lydia Dixon and Benjamin Hale

*Ecological Restoration*, Vol. 32, No. 3, 2014

Elk overgrazing in Rocky Mountain National Park (RMNP), understood largely to be a consequence of wolf extirpation, poses not only a practical problem, but also several conceptual hurdles for park managers. The current RMNP ecosystem management plan addresses overgrazing by

culling elk and fencing off riparian environments. This “functionalist” view effectively substitutes the role of wolves in the ecosystem with human intervention, and implicitly conflates the role or function of wolves with wolves themselves. In this paper, we argue that such substitution logic presents a conceptual problem for restoration. Seeking a resolution for this “substitution problem,” we distinguish between “reparative restoration” and “replacement restoration.” Where reparative restoration seeks to repair damage, replacement restoration seeks more aptly to replace the function of one ecological component with another. We suggest that in many cases reparative restoration is preferable to replacement restoration, and when characterized as such, may serve to better justify wolf reintroduction. Read more: [http://sciencepolicy.colorado.edu/admin/publication\\_files/2014.22.pdf](http://sciencepolicy.colorado.edu/admin/publication_files/2014.22.pdf).



## Pure Science Ideal and Science Policy

by **Roger A. Pielke, Jr.**

*Bridges*, Vol. 39, May 2014

With apologies to John Maynard Keynes, much of what occurs in discussions of science policy is in servitude to the ideas of some defunct scientist from quite a few years back. A fascinating workshop in Bonn, Germany, last month explored the deep historical currents that shape how we think today about the role of science in society. The concepts that we use in science policy reflect historical debates about class, economics, and politics that exert continuing influence on how we think about the role of publicly supported research in society. Here I will describe some of what stood out for me among the impressive array of historical research presented at the conference workshop. Read more: <http://ostaustria.org/bridges-magazine/item/8175-pielkes-perspective>.



## Reconciliation of Trends in Global and Regional Economic Losses from Weather Events: 1980–2008

by Shalini Mohleji and **Roger Pielke Jr.**

*Natural Hazards Review*, February 2014

In recent years, claims have been made in venues including the authoritative reports of the Intergovernmental Panel on Climate Change (IPCC) and in testimony before the U.S. Congress that economic losses from weather events have been increasing beyond that which can be explained by societal change, based on loss data from the reinsurance industry and aggregated

since 1980 at the global level. Such claims imply a contradiction with a large set of peer-reviewed studies focused on regional losses, typically over a much longer time period, which concludes that loss trends are explained entirely by societal change. To address this implied mismatch, this study disaggregates global losses from a widely utilized reinsurance data set into regional components and compares this disaggregation directly to the findings from the literature at the regional scale, most of which reach back much further in time. Read more: [http://sciencepolicy.colorado.edu/admin/publication\\_files/2014.17.pdf](http://sciencepolicy.colorado.edu/admin/publication_files/2014.17.pdf).



### The Rightful Place of Science: Disasters and Climate Change

by Roger Pielke, Jr.

*Consortium for Science, Policy & Outcomes*, November 2014

In recent years the media, politicians, and activists have popularized the notion that climate change has made disasters worse. But what does the science actually say? Roger Pielke, Jr. takes a close look at the work of the Intergovernmental Panel on Climate Change, the underlying scientific research, and the data to give you the latest science on disasters and climate change. What he finds may surprise you and raise questions about the role of science in political debates. More information: <http://www.amazon.com/Rightful-Place-Science-Disasters-Climate/dp/0692297510/>.



### Restoration, Obligation, and the Baseline Problem

by Alex Lee, Adam Perou Hermans, and Benjamin Hale

*Environmental Ethics*, Volume 36, Issue 2, Summer 2014

Should we restore degraded nature, and if so, why? Environmental theorists often approach the problem of restoration from perspectives couched in much broader debates, particularly regarding the intrinsic value and moral status of natural entities. Unfortunately, such approaches are susceptible to concerns such as the baseline problem, which is both a philosophical and technical issue related to identifying an appropriate restoration baseline. Insofar as restoration ostensibly aims to return an ecosystem to a particular baseline state, and depends upon clearly identifying this baseline for success, the very project of restoration appears impossible to get off the ground. Recasting environmental restoration in terms of obligations, instead of status, value, or worth, can avoid this and other classic challenges. If obligations to restore



nature follow from intersubjectively validated reasons to justify our actions, we can salvage restoration from the threat of the baseline problem. Read more: [http://sciencepolicy.colorado.edu/admin/publication\\_files/2014.25.pdf](http://sciencepolicy.colorado.edu/admin/publication_files/2014.25.pdf).

### The Most Terrifying Thing About Ebola

by Benjamin Hale

*Slate Magazine*, September 19, 2014

As the Ebola epidemic in West Africa has spiraled out of control, affecting thousands of Liberians, Sierra Leonians, and Guineans, and threatening thousands more, the world's reaction has been glacially, lethally slow. Only in the past few weeks have heads of state begun to take serious notice. To date, the virus has killed more than 2,600 people. This is a comparatively small number when measured against much more established diseases such as malaria, HIV/AIDS, influenza, and so on, but several factors about this outbreak have some of the world's top health professionals gravely concerned:



**Its kill rate:** In this particular outbreak, a running tabulation suggests that 54 percent of the infected die, though adjusted numbers suggest that the rate is much higher.

**Its exponential growth:** At this point, the number of people infected is doubling approximately every three weeks, leading some epidemiologists to project between 77,000 and 277,000 cases by the end of 2014. Read more: [http://www.slate.com/articles/health\\_and\\_science/medical\\_examiner/2014/09/why\\_ebola\\_is\\_terrifying\\_and\\_dangerous\\_it\\_preys\\_on\\_family\\_caregiving\\_and.html](http://www.slate.com/articles/health_and_science/medical_examiner/2014/09/why_ebola_is_terrifying_and_dangerous_it_preys_on_family_caregiving_and.html).

### Science Advice to Governments

by Roger A. Pielke, Jr.

*Bridges*, Vol. 41, October 2014

Globally, governments have incredible access to expertise. Some of these experts work directly for governments, while others are found in academia, in business, and in civil society. How can governments best tap into this wide array of expertise in making policy?

This important question was the backdrop for the first global conference on science advice to governments, held in Auckland, New Zealand, in August 2014. The conference focused on government science advisory mechanisms, which includes (especially in some Commonwealth nations) a Chief Scientific Advisor whose role is to support a prime minister or departmental chief. Read more: <http://ostaustria.org/bridges-magazine/item/8285-pielkes-perspective>.



# S&T OPPORTUNITIES

## AGI/Schlumberger Fellowship in Geoscience Communication

The American Geosciences Institute is accepting applications for the AGI/Schlumberger Fellowship in Geoscience Communication. The successful candidate will play a leading role in AGI's Critical Issues program, a new initiative to make relevant geoscience information more accessible to decision makers at all levels. The program is supported through AGI's Center for Geoscience Education and Public Understanding.

The fellowship offers a superb opportunity to link the geoscience community and our understanding of the Earth to decision-making processes throughout the country.

Primary duties and responsibilities will include:

- Developing geoscience-based content for the Critical Issues website, including fact sheets, webinars, and other information products
- Working with technical experts to ensure the accuracy and impartiality of information products
- Promoting the program's products and services to decision makers and geoscientists via meetings, webinars, conferences, social media, and other channels
- Providing input on the program's direction, planning, and communications strategy
- Providing regular status reports on fellowship activities and achievements

The fellowship is a 6- to 12-month appointment, based at AGI headquarters in Alexandria, VA. Candidates should have completed or be currently pursuing a Master's or higher degree. The fellowship carries a stipend of \$4,000 per month.

For more information, please visit <http://bit.ly/AGISchFellowship>.

## Journal of Science Policy & Governance Openings for Associate Editors

JofSPG is looking for talented associate editors to help foster a public forum for the discussion of the most pressing issues in science and technology policy today!

Associate editors typically spend 1-3 hours a week editing articles and working on the production of JSPG. We require a commitment through the end of the Spring Semester 2015. Extensions are negotiable. All positions are voluntary and uncompensated.

Applicants should be graduate students or young scholars in science policy.

To apply: Send a resume, 2 paragraph cover email explaining your interests in science policy, and a writing sample to [jofspg@gmail.com](mailto:jofspg@gmail.com).

### Future Energy Fellows to write for The Energy Collective

The Energy Collective is looking for students interested in writing on energy-related topics.

Under our Shell Future Energy Fellows Program, we are looking to hire several graduate students specializing in the areas of Biofuels, Natural Gas, Solar Power, Wind Power, Oil & Gasoline and Nuclear with writing experience.

The Future Energy Fellows program hires writers representing the future leadership of the energy industry, advocacy, academic and policy communities. Writers will be selected based on relevant expertise and quality of work (I'm sure you'll all be well-qualified candidates!). Fellows will write three articles with the help of our editorial team over the course of two months (roughly November-December 2014) and participate in one online "tweet chat" conversation on their topics. All Fellows will be compensated for the work they produce.

For more information contact Jesse Jenkins ([jesse.d.jenkins@gmail.com](mailto:jesse.d.jenkins@gmail.com)) or Brian Farnan ([brian@socialmediatoday.com](mailto:brian@socialmediatoday.com)).

## INSIDE THE GREENHOUSE VIDEO INTERVIEWING MARY ROBINSON



### Creative Communication About Climate Change

*Mary Robinson Interview, former President of Ireland (Mary Robinson Foundation Climate Justice)*

Short Interview [1:52]: <https://vimeo.com/108493722>

Full Interview [21:23]: <https://vimeo.com/108493721>

To view more CSTPR videos see: <http://sciencepolicy.colorado.edu/news/multimedia>.

## Job Opportunities



Please see the Center's Jobs Page for a list of job opportunities:

<http://sciencepolicy.colorado.edu/students/jobs>

## ABOUT US

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Editor: Roger Pielke, Jr. ([pielke@colorado.edu](mailto:pielke@colorado.edu))

Managing Editor: Bobbie Klein ([bklein@colorado.edu](mailto:bklein@colorado.edu))

Graphics/Website: Ami Nacu-Schmidt ([ami@cires.colorado.edu](mailto:ami@cires.colorado.edu))

Center for Science and Technology Policy Research

University of Colorado/CIRES

1333 Grandview Avenue, Campus Box 488

Boulder, CO. 80309-0488

Ph: 303-735-0451 Fx: 303-735-1576

<http://sciencepolicy.colorado.edu>

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