CRED Newsletter

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Announcement:

CRED has been awarded 5 more years of funding under the National Science Foundation Program *Decision Making Under Uncertainty* (DMUU) NSF-SES 0951516

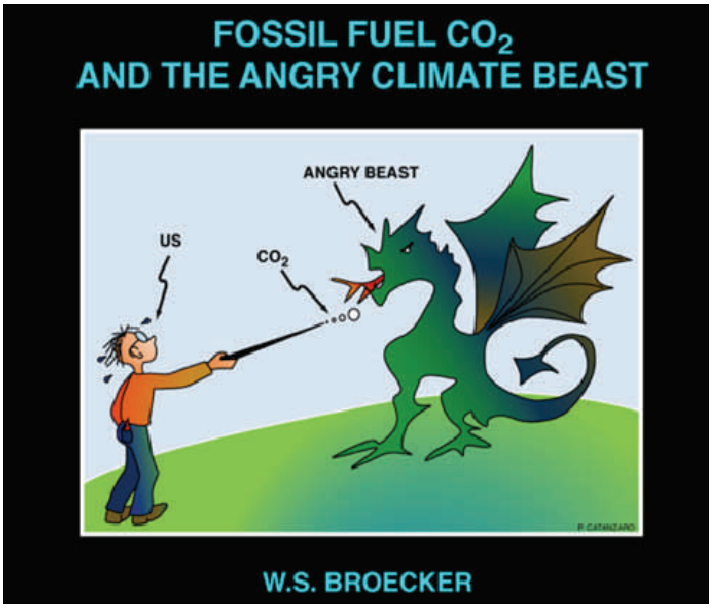
Climate Change: Uncertainty and the Burden of Proof

Op-Ed Essay (David H. Krantz)

I propose that uncertainty about climate change is an argument for **vigorous departures** from *Business-As-Usual*. The burden of proof should be shifted: anyone who **favors** *BAU* should be obliged to demonstrate that catastrophic climate change is extremely **un**likely.

Skepticism about climate change has many variants. At an extreme is conspiracy theory: reduction of greenhouse gas emission is a plot to undermine our way of life. Less extreme is the view that environmentalists select and exaggerate evidence of anthropogenic warming in order to lobby for change. Indeed, it is hard for anyone to avoid bias in evidence selection – environmentalists are not excepted. Many skeptics believe that serious consequences will be averted without drastic action – perhaps through scientific breakthroughs, or perhaps simply through massive expenditures on adaptation by future generations. (If economic growth continues, so the argument goes, our heirs will be wealthier than we, and thus both abler and more inclined to spend on environmental amelioration.) Finally, there is skepticism derived from uncertainty. The approximations in climate models lead to uncertainty, model forecasts are intrinsically probabilistic, and climate-impact models are crude; thus, both the future extent and the consequences of global warming are quite uncertain.

Skepticism, however, pales when one properly imagines ecological catastrophes that might affect *Homo sapiens*. Wally Broecker likens the climate system to an angry beast. We may be uncertain how this complex system will react, if we prod it with a sharp stick; but uncertainty is an argument for avoiding such a prod, **not** for testing it. The possible consequences of the beast's reaction to the prod are too severe to run this risk.



Yet it may already be too late. For hundreds of thousands of years, Earth's atmospheric CO_2 has cycled between about 190 and 290 parts per million (by volume), while global mean temperature has co-varied, roughly in phase with CO_2, over a range of about 10° C. But in recent years, we have driven CO_2 to about **390** ppm in Earth's atmosphere; and *Business As Usual* may drive it to double this already highly

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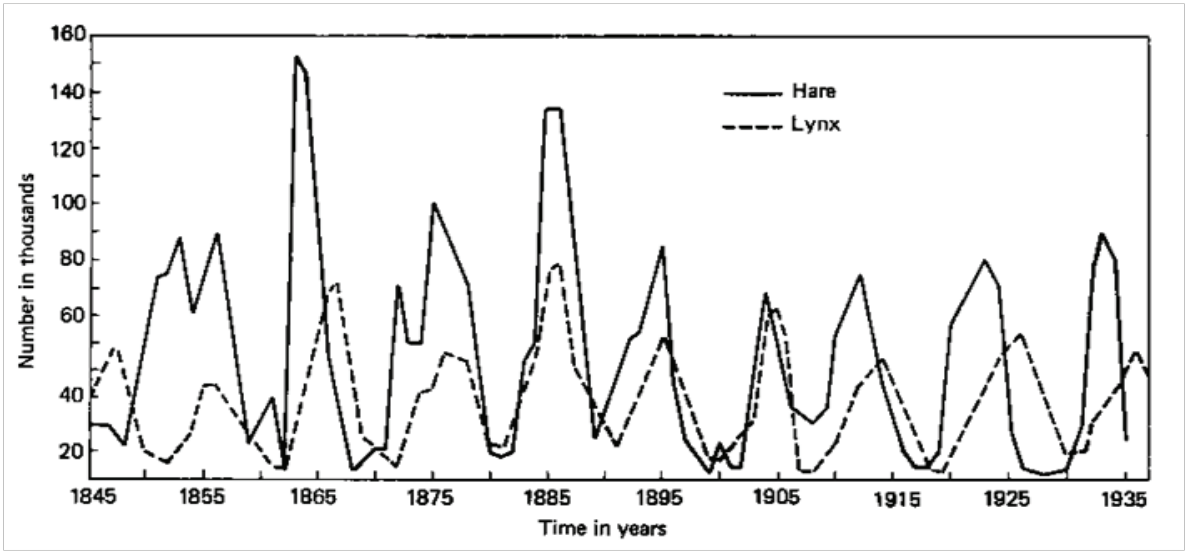

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provocative level.

To help imagine what an ecological catastrophe would be like, one can think about such catastrophes as they affect species other than *Homo sapiens*. Some populations expand and shrink by a factor of three or more. A well-studied example is the Canadian lynx, whose subpopulations expand unsustainably, in response to easy prey, but then contract drastically. The pain and the intra-specific aggression of starving lynx go unrecorded; but if human population were to shrink by a factor of 3, at least the beginning of that catastrophe would be recorded, and would make the record of human genocide over the past few millennia look like a genteel tea party.

Such a catastrophe is far from certain; but can we rule it out? The burden of proof for *BAU* would be to show that it is virtually impossible. I don't think that a credible argument of that sort can be made. Thus, uncertainty makes the case for vigorous departure from *BAU*.

CRED's primary funding comes through the National Science Foundation program called **DMUU**, or **D**ecision **M**aking **U**nder [Climate] **U**ncertainty. This program itself represents a small, ambivalent departure from *BAU*. Since climate change was uncertain, the U.S. government invested a little in research, rather than making a commitment to programs that might have strong effects on people's lives. And over the past 6 years, CRED researchers have begun to understand the complex ways in which uncertainty affects decision making.

One of our themes is *strategic use of uncertainty*: people use it as an argument for whatever action (or inaction) they already favor for other reasons. A person with strong prevention focus may use uncertainty to favor caution: don't commit to this romance, or don't release water from this reservoir. With a promotion focus, the same uncertainty would argue for eagerness: seize the opportunity, it might work out! Discussions of water allocation (CRED field site in Ceará) show clear examples where arguments based on uncertainty follow self-interest.

A recent lab result (Min Gong, *et al*.) shows that lasting effects of *subsidies for cooperation* can be obtained when there is stochastic uncertainty of outcomes.

A fuller understanding may require us to distinguish carefully among four different sources of uncertainty: (1) stochastic process; (2) psychological distance (temporal, geographic or social); (3) coordination (will enough others make this choice?); and (4) distrust of evidence (e.g., concern about the validity of a climate model or about the motives of a forecaster). Stay tuned!

I'll take this opportunity to invite Op-Ed items for future CRED newsletters.

David Hardisty Awarded NSF Funding for fMRI Study

By David Hardisty

Many important problems -- including insufficient savings, unhealthy behavior, and depletion of environmental resources -- involve short-sighted tradeoffs between immediate and future costs and benefits. In general, people sharply discount future outcomes, leading them to want good things now and put bad things off until later. Recent advances in neuroeconomics have revealed the processes by which people discount future *rewards*, yet little is known about how people evaluate future *losses,* in spite of behavior evidence suggesting large differences. The proposed research, therefore, will investigate how and why losses are discounted differently from gains.

Study research participants will make real choices between immediate and future gains and losses of varying amounts and delays. Meanwhile, their decision processes will be explored with behavioral methods, including thought listings, and neurological methods, including functional magnetic resonance imaging (fMRI). Thus, the project will investigate the reasons, emotions, and brain areas underlying discounting of losses. By discovering the ways in which discounting of losses is fundamentally different from discounting of gains, the proposed research will make significant contributions to scientific thinking about discounting in psychology, economics, neuroscience, and related fields. Its applications should improve intertemporal decision making about losses, benefiting both individuals and society. Furthermore, this project will support advanced graduate training in psychology and neuroeconomics, preparing future researchers with cutting edge methods.

CRED Congratulates Drs. Appelt & Milch

Dr. Kerry Milch (left) and Dr. Kirstin Appelt (right)
At the GSAS Convocation on Saturday, May 15, 2010

Steering Committee Meeting May 6th & 7th , 2010

CRED's steering committee met in New York on May 6th and 7th to discuss the next 5 years of NSF funding. Day 1 began with a review of the proposal and a discussion on the integration of the different themes and projects, as well as updates of the proposed projects . Later that day, the discussion centered on the revised budget with potential cuts and the possible changes in projects due to the cuts. Day 2 focused on governance issues for the new CRED, discussing options for additional funding, the formation of an external advisory board, and a continuation of the discussion of integration across projects from the prior day. Great interest in developing flagship papers was also expressed by many in the steering committee. The meeting was instrumental in opening the dialogue amongst the researchers on the topics of integration of projects and the governance structure of the new CRED.

Highlights: Spring & Summer 2010 Outreach*

August 17, 2010: Kenny Broad presented ,"Why worry about the weather?", at the Miami Museum of Science Summer High School Series

June 2010: Elke Weber was selected to be lead author in the next round of the IPCC assessment (Working Group III to the 5th Assessment Report (AR5) of the Intergovernmental Panel on Climate Change- IPCC)

May 24-27, 2010: CRED Summer Seminar for Masters Program in Climate and Society– David Krantz, Sabine Marx, Kirstin Appelt, Poonam Arora, Shahzeen Attari, Min Gong, Victoria Rosoff

May 2010: Shahzeen Attari presented ,"Lay perceptions of energy consumption and savings", at the Garrison Institute, where urban planners learned about perceptions of energy consumption

April 28, 2010: *Climate Change Psychology: How to Talk So People Will Listen and Take Action*, with Nature Conservancy at Norrie Point Environmental Center– Sabine Marx, Poonam Arora, Victoria Rosoff, Margriet van Lidth de Jeude, Andrea Basche

Spring 2010: Vanguard High School– Victoria Rosoff , Margriet van Lidth de Jeude, and Andrea Basche ,worked with Climate and Society alum Matt D'Amato in incorporating CRED's research into high school science course curriculum

April 22, 2010: Illuminating the Science: Art and Climate Change—Sabine Marx moderated a panel consisting of artists and scientists at the Earth Day event held at the CUNY Graduate Center in New York

*Please note that future newsletters will include a complete list of outreach activities– only a small sample were selected for this first issue.

Sabine Marx presents at the Climate, Mind and Behavior Symposium

On March 10th-12th, 2010 the Garrison Institute convened 72 influential thought and movement leaders for its first annual Climate, Mind and Behavior (CMB) symposium. Participants explored how knowledge from the behavioral and social sciences can inform climate change policies, regulation, communications and other strategies. Many new collaborations in the area of public policy, public engagement, communications, new economics, community indicators, real estate, and investment emerged from the CMB symposium. (From the Garrison Institute website at http://www.garrisoninstitute.org)

—> See Sabine's talk on the CRED website at: http://cred.columbia.edu/newsevents/pastevents/ or press control and click on the YouTube link to the right to view the video online

Spring 2010 Masters Research Talk: Julie Smith

Guilty Risk: A Cognitive and Social Approach

By, Julie Smith

People are often required to make highly consequential decisions when emotions run high. Such decisions may include financial decisions after losing a job, treatment decisions after being diagnosed with a certain disease, or environmental decisions after recognizing the toll we take on earth's resources. Regardless of domain, emotions play an important role in guiding judgments and decisions.

This study looked specifically at the emotion of guilt and risk-taking behavior by means of decision making. Participants were placed in one of two conditions: guilt vs. control. The participants in the guilt condition experienced guilt after they were asked to read a guilt-inducing story and empathize with the character portrayed in the story. The participants in the control condition read a story that was emotionless in nature. They too were asked to empathize with the character portrayed in the story.

In general, we found that guilt causes an increase in risk-seeking behavior. This finding is mediated by how guilty participants were feeling at the time they made their decisions. Additionally, guilt made men, but not women, more risk seeking in their decision making behavior. This work may provide insight to important individual and social consequences regarding the impact of affective states on risky choice.

Inside CRED

Graduate student Julie Smith and Jason Holterhaus are getting married on October 9, 2010.

Congratulations, Julie!

Graduate student Maria Konnikova married Geoff Hamilton in January 2010.

Congratulations, Maria!

Former Assistant Director and CRED affiliate Debika Shome and Justin Gale are getting married on October, 10th, 2010.

Congratulations, Debika!

CRED congratulates Poonam Arora on her new position as Assistant Professor in the Department of Management at Manhattan College.

Poonam will be teaching *Introduction to Management* and *Strategic Management* this Fall.

Congratulations to Nicole Peterson on her new position as Assistant Professor in the Department of Anthropology at the University of North Carolina at Charlotte.

This Fall, Nicole will be teaching *Introduction to Anthropology* and *Topics in Anthropology: Ecological Anthropology.*

CRED welcomes:

Ben Orlove
CRED co-director, Ben Orlove, has moved to New York City! Ben sits in the School of International and Public Affairs and is teaching *Managing and Adapting to Climate Change,* through the Department of Earth and Environmental Sciences.

Seth Baum
PhD candidate in geography at Pennsylvania State University and a visiting scholar at CRED. Seth's research focuses on ethical theory and moral psychology in the economics of climate change. He focuses specifically on the concept of space-time discounting.

Raymond Crookes
Raymond graduated magna cum laude from Temple University with a B.A. in Psychology. He is most interested in the affects of uncertainty, risk-perception and culture on decision making. His current advisors are Elke Weber and David Krantz.

Derek Willis
Derek joins CRED as a postdoctoral researcher. He received his Ph.D. in Public Affairs from Princeton University. Derek's primary research interests are in decision making under uncertainty, with a focus on malaria policy makers. Building off a normative framework developed through his dissertation research of how malaria policy makers should use information to make decisions, he explores how framing effects, in particular, affect the actual decisions made by policy makers.

Upcoming Events:

LDEO Open House 2010

Saturday, Oct. 2nd

10am-4pm

CRED Launch Meeting

Friday, Nov, 5th

&

Saturday, Nov. 6th, 2010

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CRED is an interdisciplinary center that studies individual and group decision making under climate uncertainty and decision making in the face of environmental risk. CRED's objectives address the human responses to climate change and climate variability as well as improved communication and increased use of scientific information on climate variability and change. Located at Columbia University, CRED is affiliated with The Earth Institute and the Institute for Social and Economic Research and Policy (ISERP).

CRED was established under the National Science Foundation Program *Decision Making Under Uncertainty* (DMUU). Major funding is provided under the cooperative agreement NSF SES-0345840.

Visit CRED on the web at:

www.cred.columbia.edu

Send in your updates for the next CRED newsletter!

Your stories could be featured in the next issue !

Please send your updates to Victoria Rosoff at :

victoria@ei.columbia.edu.