

## FROM THE PRESIDENT...

I hope all of you have been having a productive year so far. If you are like me, the demands on your time are huge, but it's all good, anyway, because our profession and our work have never been more vital and influential.

### World Congress of Environmental and Resource Economists (WCERE)

Outside of work, I hope many of you are looking forward to the World Congress in Istanbul, beginning with the course on “Economics of Environmental Regime Shifts” on June 27 – 28, then the welcome reception the evening of the 28<sup>th</sup>, and the program from June 29 to July 2. We had slightly more than 1,750 submissions! The papers were blindly refereed by at least two members of the program committee and a little less than 50% were accepted—all presenters were notified of acceptances at the end of March. I want to extend special thanks to the Co-chairs of the Scientific Committee: Mark Cohen (Vanderbilt University), Timo Goeschl (Heidelberg University), and Erinc Yeldan (Yasar University); to the Chair of the Local Organizing Committee: Ozgur Kayalica (İstanbul Technical University); and to Monica Eberle, EAERE Secretary-General.

In addition to the sessions, there will be a busy social program, special speakers, a poster session, and lunchtime business meetings each day. For AERE, we are having a Board lunch meeting on Sunday, June 29, and a lunch meeting for AERE members on Monday, June 30, 2014. One change is that awards for AERE Fellow, Publication of Enduring Quality, and best *JEEM* paper (the last time this award will be given by AERE!) will be presented prior to one of the Plenary sessions instead of during the traditional AERE lunch so there will only be brief remarks at our lunch event — allowing more time for people to catch up with colleagues. In addition, Marilyn Voigt, AERE Executive Director, and I will be attending a joint lunch meeting with our sister regional associations and networks. Just to give you an overview of the expansion of our field, in addition to AERE and EAERE, they include:

### Regional Associations

- AARES [Australian Agricultural and Resource Economics Society](#)
- EAERE [East Asian Association of Environmental and Resource Economists](#)

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EAAERE [East Asian Association of Environmental and Resource Economists](#)

SEEPS [Society for Environmental Economics and Policy Studies](#)

### **Regional Networks**

EEPSEA [The Economy and Environment Program for Southeast Asia](#)

LACEEP [Latin American and Caribbean Environmental Economics Program](#)

RANESA [Resource Accounting Network for Eastern and Southern Africa](#)

SANDEE [South Asian Network for Development and Environmental Economics](#)

### **AERE Elections and the Board**

The AERE elections gave us a great Board to work with even as many of our hugely effective and committed members saw the end of their terms. Kudos, first, to outgoing officers: Cathy Kling (Iowa State University), Past President; Don Fullerton (University of Illinois), Vice President; Juha Siikamaki (Resources for the Future), Treasurer; Sarah Stafford (College of William and Mary), Secretary; plus Board members: Patty Champ (US Forest Service, Rocky Mountain Research Station) and Andrew Plantinga (Oregon State University). The new officers are Vic Adamowicz (University of Alberta), President-Elect; Richard Newell (Duke University), Vice President; Dallas Burtraw (Resources for the Future), Treasurer; Sarah West (Macalester College), Secretary; and Board members Gib Metcalf (Tufts University) and Wolfram Schlenker (Columbia University).

### ***Journal of the Association of Environmental and Resource Economists (JAERE)***

Our new journal, [JAERE](#), is developing smoothly. Dan Phaneuf (University of Wisconsin-Madison), Editor, has assembled a great editorial team. The inaugural issue is already in production and it will be printed in time for distribution at the World Congress. We also have high quality submissions for an additional one to two issues. Nevertheless, I urge all of our members (and your colleagues, who should be members!), to submit your best papers to *JAERE*—see the Call for Papers on page 9. When you are at the World Congress, please promote the journal with anyone who may not have heard about this new opportunity. Our goal is for *JAERE* to be the premiere journal in our field and we are happy that the University of Chicago Press is providing *JAERE* to libraries and less developed countries, and participating in JSTOR.

### **AERE Sessions at National and Regional Meetings**

Once again, thanks to the generous volunteer efforts of various AERE members, we have the opportunity to present papers at a number of meetings this year. The Program Committee with Chair Josh Graff Zivin (University of California, San Diego), Meredith Fowlie (University of California, Berkeley) and Katrina Jessoe, (University of California, Davis), has pulled together AERE sessions for the **Agricultural and Applied Economics Association** (AAEA) meeting in Minneapolis, Minnesota this July and they will soon finalize the program for the **Allied Social Science Associations** (ASSA) meeting in Boston, Massachusetts in January. (There are no AERE sessions this year at the Western Economic Association International Conference.) John Whitehead (Appalachian State University) has once again organized sessions for the annual meeting of the **Southern Economic Association** in November in Atlanta, Georgia. Lea-Rachel Kosnik (University of Missouri, St. Louis), has again volunteered to organize AERE sessions at next year's **Midwest Economic Association (MEA)** annual meeting in Minneapolis, Minnesota, next March. The sessions at last year's MEA meeting in Evanston, Illinois (the first for AERE) were very successful and we are all glad to see this new option off to such a terrific start. See the Call for Papers for details. If anyone is interested in organizing some sessions at the **Eastern Economic Association** conference, please let me know. These regional meetings are certainly valuable.

Finally, I want to report that as of this writing we have two complete proposals for the Summer AERE conferences. One of these will be for 2015 and the other for 2016. Stay tuned!

Have a great summer.  
Alan

**Dr. Alan Krupnick**  
**AERE President**  
**Resources for the Future**  
**Washington, DC 20036**  
**[krupnick@rff.org](mailto:krupnick@rff.org)**  
**Office phone: 202-328-5107**

## AERE NEWS

### AERE BOARD OF DIRECTORS MEETING

The AERE Board of Directors is meeting on Sunday, June 29, 2014, from 12:30 – 2:00 pm during lunch at the WCERE 2014 in the ICEC Istanbul Lütfi Kırdar Convention & Exhibition Centre, Room TBD.

Anyone with matters to be brought before the Board should contact the AERE president:

**Dr. Alan J. Krupnick**  
**Resources for the Future**  
**[Krupnick@rff.org](mailto:Krupnick@rff.org)**  
**Office phone: 202-328-5107**

### NOMINATIONS FOR AERE BOARD MEMBERS

This year, AERE members will vote for two new members of the Board of Directors who will serve for three years beginning in January 2015. The nominations are being handled by a committee chaired by AERE Vice President Richard G. Newell (Duke University). Elections will occur in the fall of 2014.

Nominations may also be made by the membership through petitions, each of which contains signatures of 5% of the association's members who are then in good standing. Such petitions should be sent to arrive at the AERE Secretary's (Sarah West) address no later than **August 1, 2014**.

**Sarah E. West**  
**Professor of Economics**  
**Macalester College**  
**1600 Grand Avenue**  
**Saint Paul, MN 55105**  
**[wests@macalester.edu](mailto:wests@macalester.edu)**

### AERE PUBLICATION OF ENDURING QUALITY AWARD 2014 CALL FOR NOMINATIONS

The AERE Board of Directors will present the annual award (to co-authors if appropriate) for a publication of enduring quality that appeared at least five years prior to the year of the award. Nominated works are to be evaluated on their seminal nature and enduring value. Place and type of publication are unrestricted but posthumous awards will not be given. Nominees may include individuals who are not members of AERE.

Evaluation of nominated works and final selection for the 2014 award will be undertaken by a committee chaired by Klaas van 't Veld (University of Wyoming). Nomination packages should consist of four copies each of a cover letter, a document supporting the nomination, and the publication itself. The supporting document (not to exceed three pages) should include quantitative as well as qualitative information (e.g., number of citations or copies printed). Nominations should be sent to arrive no later than **December 1, 2014**. This is an important award for AERE and for the recipients. Please give serious consideration to nominating a publication and to observing the submission requirements.

**Klaas van 't Veld**  
**University of Wyoming**  
**Email: [klaas@uwyo.edu](mailto:klaas@uwyo.edu)**  
**Subject Line: AERE PEQ Award**

**AERE FELLOWS 2014  
CALL FOR NOMINATIONS**

This program recognizes outstanding contributions to the field by members of the association. The 2014 AERE Fellows will be announced at the AERE Summer Conference in 2015.

**Criteria:** Awardees will have demonstrated a significant contribution to the advancement of the profession of environmental and resource economics. A candidate must be living at the time of nomination; membership in AERE is not required.

**Nomination Process:** Any member of AERE may nominate a candidate for Fellow. A nomination packet should include a vita of the nominee, a two-page nomination letter outlining what contributions the individual has made that warrant the award, and at least one additional letter of support from a second individual.

In addition, members of the AERE Board of Directors may consider candidates that have not been otherwise nominated that they feel are especially worthy.

**Selection Process:** Nomination packages are to be submitted by **December 1, 2014**, to:

**Dr. Alan Krupnick**  
**AERE President**  
**Resources for the Future**  
**1616 P Street NW**  
**Washington, DC 20036**  
**[Krupnick@rff.org](mailto:Krupnick@rff.org)**  
**Office phone: 202-328-5107**

The president will distribute copies to each of the Board members who will select newly appointed Fellows from the set of nominations. Newly elected Fellows will be notified in advance to provide ample time to make travel arrangements to attend the Awards Program. In future years, a separate Fellows Committee may be impaneled to aid in the initial screening of candidates.

**Maximum Number of Awards:** Three for 2014

**AERE Fellows 2012**

Lawrence H. Goulder  
John Loomis  
Robert Pindyck

**AERE Fellows 2011**

Trudy Ann Cameron  
William D. Nordhaus  
Jim Wilen

**AERE Fellows 2010**

Alan J. Krupnick  
Stephen Polasky  
Martin L. Weitzman

**AERE Fellows 2009**

Richard T. Carson  
Charles D. Kolstad  
Robert N. Stavins

**AERE Fellows 2008**

Thomas Crocker  
A. Myrick Freeman III  
Alan Randall

**AERE Fellows 2007**

Daniel W. Bromley  
Gardner M. Brown, Jr.  
Charles W. (Chuck) Howe  
Kenneth E. (Ted) McConnell  
Kathleen Segerson  
David Zilberman

**AERE Fellows 2006**

Richard C. Bishop  
Nancy E. Bockstael  
Ronald G. Cummings  
Anthony (Tony) C. Fisher  
Geoffrey M. Heal  
Clifford S. (Cliff) Russell

**Inaugural AERE Fellows 2005**

Maureen L. Cropper  
W. Michael Hanemann  
Karl-Göran Mäler  
Wallace E. Oates  
V. Kerry Smith  
Tom Tietenberg

**5<sup>TH</sup> WORLD CONGRESS OF  
ENVIRONMENTAL AND RESOURCE  
ECONOMISTS (WCERE)**

**June 28 – July 2, 2014  
Istanbul, Turkey**

The 5th World Congress of Environmental and Resource Economists (WCERE) will take place in Istanbul, Turkey in the Istanbul Lutfi Kırdar Convention & Exhibition Centre. After Venice (1998), Monterey (2002), Kyoto (2006), and Montréal (2010), the profession will convene in this unique World Heritage city that straddles Europe and Asia. Over 1,750 papers were submitted and just under 50% were accepted.

Immediately before the WCERE begins, a short course on “Economics of Environmental Regime Shifts” will be held at the Istanbul Technical University (ITU) on June 27 - 28. The target audience is researchers from developing and transition countries. It is organized by the Beijer Institute of Ecological Economics (Royal Swedish Academy of Sciences, Stockholm, Sweden); and funded by the Beijer Institute, the Canadian International Development Research Centre (IDRC), and the European Association of Environmental and Resource Economists (EAERE).

Keynote speakers at the WCERE include:

**Robert H. Frank** (Cornell University): "The Myth of Painful Economic Choices"

**Eswaran Somanathan** (Indian Statistical Institute): "Social Learning and Choice Theory"

**Matthew Kahn** (University of California, Los Angeles, Institute of the Environment): "Urban Growth and Climate Change: The Adaptation Challenge".

In addition, there will be a Plenary Panel: "Challenges and Policies for a Low Carbon Future" moderated by **Carlo Carraro** (Chancellor of the University of Venice) with **Ottmar Georg Edenhofer**, **Laurence Tubiana**, and **Jeffrey D. Sachs**.

Hosted by Istanbul Technical University (ITU), one of Turkey's most distinguished universities, WCERE 2014 is jointly organized by the Association of Environmental and Resource Economists (AERE) and the European Association of Environmental and Resource Economists (EAERE), in cooperation with the East Asian Association of Environmental and Resource Economists (EAAERE).

The location of the 5th World Congress acknowledges the importance of Istanbul and Turkey in matters of environment, energy and education. Istanbul is Turkey's cultural, economic and financial center, with a rich history, distinct culture, and beautiful cityscapes. Easily accessible by air from many major European and American cities, Istanbul offers not only a cosmopolitan experience, but is also regarded by many as one of the best conference destinations of the world. Located in the heart of the city, ITU has a 240 year distinguished history, with currently over 30,000 full-time undergraduate, Masters and PhD. students. Among its research institutes and departments are the Energy Institute, Energy Economics Research Group, Environmental Engineering and the Department of Economics.

Turkey is situated close to several major oil exporting countries and at some of the most vital energy crossroads. Tanker traffic and natural gas pipelines make Turkey an important east-west route for energy transfer. In addition to its geographical significance, Turkey is currently going through a major revision in its policies and perspectives towards the environment and natural resources – making this conference especially valuable to both participants and local policymakers.

Please bookmark the Congress website, [www.wcere2014.org](http://www.wcere2014.org), where you will find detailed information.

The Chair of the Local Organizing Committee (LOC) is **M. Özgür Kayalica** (Istanbul Technical University).

The co-chairs of the Program Committee are **Mark Cohen** (Vanderbilt University), **Timo Goeschl** (Heidelberg University), and **Eriñç Yeldan** (Yaşar University).

## AERE MEMBERSHIP OPTIONS

AERE membership rates for 2014 remain the same. Please renew your membership now and take advantage of the three-year payment plan! Discounted rates are available for students as well as individual residents of low, lower-middle, and upper-middle income countries in accordance with the definition provided by the World Bank. Membership will include a free electronic subscription to *JAERE* effective June 2014.

AERE also invites colleges, universities, and university research centers to become University Members of AERE and research institutions, nonprofit organizations, government agencies, and corporations to become Institutional Members of AERE.

To become a **University Member**, a contribution of \$350\* is required. With this contribution, colleges and universities:

- may designate one person (or up to four students) to receive a 2014 individual membership in AERE. Benefits include an electronic subscription to the *Review of Environmental Economics and Policy (REEP)* and (effective May 2014) AERE's new journal, the *Journal of the Association of Environmental and Resource Economists (JAERE)*. Please see the complete listing of membership benefits on the AERE web page.
- are entitled to a sponsorship listing on the AERE Web page ([www.AERE.org](http://www.AERE.org)) and in the *AERE Newsletter* and *JAERE*;
- will receive one free advertisement on the AERE Web page and in the *AERE Newsletter* for the calendar year (a savings of \$250).

To become an **Institutional Member** of AERE, a contribution of \$1,000\* is required. With this contribution, institutions receive the above benefits plus:

- two nontransferable tickets for institution staff to the annual AERE Business Meeting and Luncheon at the ASSA meeting in Boston, Massachusetts in January 2015;
- recognition at the annual AERE Business Meeting and Luncheon at the ASSA meeting.

\*Note: A discounted rate of \$100 for University and Institutional membership with some benefits (see the AERE web page under "Membership") is available for organizations located in low, lower-middle, and upper-middle income countries in accordance with the definition provided by the World Bank.

## AERE MEMBERSHIP SERVICES

Please direct any questions or requests regarding your membership, subscriptions to *REEP*, luncheon or AERE Conference registrations, receipts, or related membership matters to:

AERE Membership Services  
Future Field Solutions  
13006 Peaceful Terrace  
Silver Spring, MD 20904  
[info@aere.org](mailto:info@aere.org)  
Telephone: 202-559-8998  
Fax: 202-559-8998

Marilyn M. Voigt, AERE Executive Director, can be reached at:

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## *AERE Newsletter*

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## 2014 INSTITUTIONAL AND UNIVERSITY MEMBERS OF AERE

### Institutional Members

Environmental Defense Fund

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Resources for the Future

### University Members

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Energy Policy Institute at Chicago (EPIC)

Harvard University  
Harvard Environmental Economics Program

University of Connecticut  
Department of Economics

Iowa State University  
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University of Oregon  
Department of Economics

University of Calgary  
Department of Economics

University of Tennessee  
Department of Economics

University of California, Davis  
Department of Agriculture and  
Resource Economics

Virginia Tech  
Department of Agricultural & Applied Economics

## CALLS FOR PAPERS

### *AERE NEWSLETTER*

The *AERE Newsletter* is soliciting essays from AERE members about natural resource and environmental economics issues of general interest to the membership. These essays can be relatively short (6-10 double spaced pages) and address a topic that does not fit into the traditional journal outlet. There is currently no backlog, so your essay would likely be published in the November AERE Newsletter. Marilyn Voigt and I need your essay by August for the November issue. If you wish to float an idea by me, feel free to contact me.

**John Loomis**

**AERE Newsletter Co-Editor**

**[jloomis@lamar.colostate.edu](mailto:jloomis@lamar.colostate.edu)**

**Telephone: 970-491-2485**

### CANADIAN RESOURCE AND ENVIRONMENTAL ECONOMICS (CREE) STUDY GROUP

**CREE 2014 Annual Conference**  
**October 3-5, 2014**  
**University of Saskatchewan**  
**Saskatoon, Canada**

The deadline for submission of abstracts/papers to the 24<sup>th</sup> annual meeting of the CREE Study Group is **Sunday, June 15, 2014**.

Abstracts may be submitted directly via the following link:

<http://economics.ca/cree/2014/call.php>

Further information about accommodations, registration, etc. can be found [here](#). Please note that registration opens on **May 31<sup>st</sup>**. In time, the web page will be updated to include program and participant information.

Please contact us at [cree2014@economics.ca](mailto:cree2014@economics.ca) if you have any questions. Looking forward to welcoming you to The Land of Living Skies.

#### **CREE 2014 Organizing Committee**

**Joel Bruneau, Diane Dupont, Saeed Moshiri,  
Rachel Sampson**

### **EAERE 23<sup>rd</sup> ANNUAL CONFERENCE**

**June 28 – July 1, 2017**

**Venue to be decided**

**Call and Guidelines** for Expressions of Interest, Local Organizing Committee and Conference Venue

**Deadline: December 15, 2014**

E-mail: [eaere@eaere.org](mailto:eaere@eaere.org)

Subject Line: EAERE Conference 2017

### **GOING GREEN – CARE INNOVATION 2014**

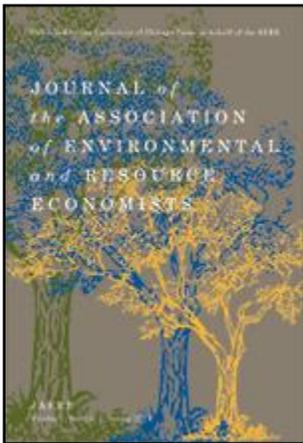
**November 17 – 20, 2014**

**Schoenbrunn Palace Conference Centre**  
**Vienna, Austria**

The International CARE Electronics Office is pleased to announce the **Going Green – CARE INNOVATION 2014** conference and exhibition on Electronics and the Environment. This Symposium is the only platform for presenting the up-to-date progress on sustainable development and the development of eco-efficient electr(on)ic and automotive products. This year's program will feature the latest in environmental design, clean manufacturing, resource efficiency, climate change, new eco-efficient technologies, collection, reverse logistics, refurbishment, carbon trading, re-use, recycling and policy-making from leading experts in industry, academia, consulting, recyclers and public area around the globe. Leading companies and institutions in green electr(on)ics will present their innovative products, processes and services at the exhibition.

**Abstract Deadline: May 31, 2014**

Website: <http://www.care-electronics.net/CI2014/>



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***JOURNAL OF THE  
ASSOCIATION OF  
ENVIRONMENTAL  
AND RESOURCE  
ECONOMISTS  
(JAERE)***

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**Frequency:** 4 issues/year  
**ISSN:** 2333-5955  
**E-ISSN:** 2333-5963

**Editor-in-Chief:**  
Daniel J. Phaneuf

As the official research journal of the *Association of Environmental and Resource Economists*, *JAERE* publishes papers that are devoted to environmental and natural resource issues. The journal's principal mission is to provide a forum for the scholarly exchange of ideas in the intersection of human behavior and the natural environment. Focusing on original, full-length research papers that offer substantial new insights for scholars of environmental and resource economics, *JAERE* presents a range of articles that are relevant for public policy, using approaches that are theoretical, empirical, or both.

To warrant publication, papers must present new empirical findings of widespread interest to readers, or offer new analytical results or methods that may potentially influence the course of future research. Theoretical work should be rigorous in approach but presented in a way that emphasizes original economic insights over technical contributions. Methodological papers should be motivated by a clearly demonstrated need and evaluated against existing approaches. Empirical analyses should illustrate the sources of variability in the data and the importance of assumptions and structure in drawing inferences. Details sufficient for replication should be provided in the paper, as an online appendix, and/or upon request to the author.

As with all fields, the boundaries of environmental and resource economics are flexible, and *JAERE* welcomes a broad spectrum of topics. Several areas of economic research are separate fields but have themes that overlap with environmental or resource economics. Submissions from these fields are welcome when a primary emphasis is on an environmental or resource theme. A few notable examples include:

- *Agricultural Economics*. Studies related to agricultural production, markets, and policies are within *JAERE*'s scope if they relate to pollution

consequences, climate change adaptation, environmental consequences of biofuels, and related agriculture-environment themes

- *Development Economics*. Many development-related topics emphasize environmental degradation or natural resource use, particularly as related to common pool resources and health or environmental outcomes. Such papers are within the scope that *JAERE* will consider.
- *Energy Economics*. Studies focused on the use of natural resources for energy production or the emission consequences of energy demand, supply, or policy are within the scope of topics that *JAERE* will consider.
- *Fisheries and Forestry Economics*. Studies related to specific renewable resources such as fisheries and forests are well within the scope of *JAERE*, and submissions in these areas are welcome.

In many instances specialized journals exist that are devoted to themes in these fields that overlap with environmental and resource economics. Submission to *JAERE* should be of interest beyond the niche readership served by the specialty journals.

Since *JAERE*'s readership is primarily economists, papers from other disciplines are welcome but will be evaluated based on their relevance for economic research, and their placement in and contribution to an environmental economics literature. Multidisciplinary papers are welcome if a primary focus rests with the economic aspects of the topic.

For any questions regarding submissions, please contact Editor-in-Chief Dan Phaneuf at:

[jaere@ae.wisc.edu](mailto:jaere@ae.wisc.edu).

**Submit your paper at:**

**[journals.uchicago.edu/jaere](http://journals.uchicago.edu/jaere)**

**AERE Members:**

Please encourage your institution to subscribe to *JAERE*. Electronic and Print+Electronic institutional subscriptions include unlimited online access.

**MIDWEST ECONOMIC ASSOCIATION  
(MEA) ANNUAL MEETING**

**March 27 – 29, 2015  
Hyatt Regency Minneapolis  
Minneapolis, Minnesota**

**Call for Papers: AERE Sessions**

The first ever AERE sessions at the 2014 MEA meeting in Chicago were a big success. The papers and discussants were of high caliber and attendance was excellent. So, AERE will have sessions at the 2015 MEA Meeting taking place on March 27 - 29, 2015 at the Hyatt Regency Minneapolis in Minneapolis, MN.

Authors wishing to have a paper considered for the AERE sessions should send a .pdf file by e-mail to:

**Dr. Lea-Rachel Kosnik**  
**University of Missouri-St. Louis**  
[kosnikl@umsl.edu](mailto:kosnikl@umsl.edu)

**Subject Line: AERE MEA Abstract Submission**

Deadline to submit is **September 1, 2014**. Files should be sent by the proposed presenter who will be the contact for correspondence. The file should contain the following information:

1. Author's (and co-author's) name, address, affiliation, telephone number, and e-mail address.
2. Title of paper.
3. Abstract of no more than 150 words.
4. JEL codes.

Papers submitted without all the required information will not be considered. Electronic acknowledgements of submissions will be sent to all submitters. Proposals for complete sessions are also encouraged. Organizers of proposed sessions should submit abstracts for each of the papers following the above instructions. Papers may be accepted or rejected on an individual basis unless the organizer specifically requests the session be considered only in its entirety.

All selected presenters must be 2015 AERE members and priority consideration for discussants will be given to current AERE members.

**Note:** An evening networking opportunity will be available for AERE attendees at the MEA meeting—an informal dinner on Saturday, March 28th, at a restaurant near the conference to be organized by Lea-Rachel Kosnik ([kosnikl@umsl.edu](mailto:kosnikl@umsl.edu)).

***NATURAL RESOURCES POLICY RESEARCH*  
DESIGNING WATER DISASTER POLICIES:  
THEORY AND EMPIRICS**

Call for papers for Special Issue of *Natural Resources Policy Research*: Designing Water Disaster Policies: Theory and Empirics.

We are seeking original contributions that will explore and shed light on the policy topics, using historical surveys, institutional analysis, econometric investigations, empirical case studies and conceptual-theoretical discussions.

Policy-rich cross-disciplinary and transnational papers that examine the causes and consequences of water disasters are especially welcome. Possible topics include:

- Policy frameworks for water disaster management
- Risk reduction and management
- Vulnerability (including climate-induced) reduction and assessment
- Capacity-building and resilience
- Disaster risk reduction-development linkage
- Institutional entropy reduction
- Polycentric decision making
- Water governance-water policy nexus

**Deadline: July 1, 2014**

Contact **Dr. Chennat Gopalakrishnan**, Editor and Professor Emeritus, University of Hawaii at Manoa, if you have any questions ([chennat@hawaii.edu](mailto:chennat@hawaii.edu)).

# CONFERENCES AND MEETINGS

## AGRICULTURAL & APPLIED ECONOMICS ASSOCIATION (AAEA)

July 27 - 29, 2014  
Hyatt Regency Minneapolis  
Minneapolis, Minnesota

### AERE Sessions for the AAEA Meetings

**Note: The first presenter in each session will serve as Chair of the session; presenters are in bold font.**

#### Session I: Long-run and Short-run Effects of Natural Disasters

Human-induced climate change is projected to increase the frequency and intensity of extreme events. However, the welfare impacts of these changes are poorly understood. The papers in this session examine the short- and long-run impacts of tornadoes, hurricanes, and ENSO on a range of economically important outcomes, including migration, employment, earnings, and human capital. The authors also consider the effects of ex-ante and ex-post policies, such as disaster assistance and rebuilding and draw implications as to what their appropriate role should be.

*The Economic Impact of Hurricane Katrina on its Victims: Evidence from Individual Tax Returns*

**Tatyana Deryugina** (University of Illinois)  
[deryugin@illinois.edu](mailto:deryugin@illinois.edu)

Coauthors: Laura Kawano (US Department of the Treasury) and Steven Levitt (University of Chicago)

*Structural Estimation of an Equilibrium Model with Externalities: Program Evaluation of Post-Katrina Rebuilding Grants*

**Jesse Gregory** (University of Wisconsin)  
[jmgregory@ssc.wisc.edu](mailto:jmgregory@ssc.wisc.edu)

Coauthor: Fu Chao (University of Wisconsin)

*Blown Away: The Effect of Federal Assistance on Individual Finances and Migration Decisions After a Natural Disaster*

**Justin Gallagher** (Case Western Reserve)  
[jpg75@case.edu](mailto:jpg75@case.edu)

Coauthor: Daniel Hartley (Federal Reserve Bank of Cleveland)

*Long-term Human Capital Impacts of the Global Climate*

**Jesse Anttila-Hughes** (University of San Francisco)  
[jkanttilahughes@usfca.edu](mailto:jkanttilahughes@usfca.edu)

Coauthor: Marshall Burke (University of California, Berkeley)

#### Session II: Information and Behavior

Information and its assimilation are critical for economic decisionmaking. This session examines behavioral responses in a range of environmental contexts.

*Economics of a Light Bulb: Experimental Evidence on CFLs and End-user Behavior*

**Robyn Meeks** (University of Michigan)  
[meeks@umich.edu](mailto:meeks@umich.edu)

Coauthor: Eliana Carranza (World Bank)

*Shock or Salience? A Natural Experiment in Billing Frequency*

**Casey Wichman** (University of Maryland, College Park)  
[wichman@umd.edu](mailto:wichman@umd.edu)

*Forecasts and Adaptation*

**Jeffrey Shrader** (UC San Diego), [jgshrade@ucsd.edu](mailto:jgshrade@ucsd.edu)

*Loss Aversion and Public Goods: A Field Experiment in Alternative Commuting*

**Laura Grant** (University of Wisconsin)  
[grantle@uwm.edu](mailto:grantle@uwm.edu)

#### Session III: Water and Energy

Climate change and other environmental concerns have heightened interest in reducing energy and water usage. This session examines the role of economic and regulatory tools to shape demand in these sectors.

*Incorporating Random Effects in Structural Models of Piecewise-Linear Pricing: An Application to Residential Water Demand in North Carolina*

**Roger von Haefen** (North Carolina State University)  
[roger\\_von\\_haefen@ncsu.edu](mailto:roger_von_haefen@ncsu.edu)

Coauthor: Marwa Salem (North Carolina State)

*Residential Water Demand Effect of Increasing Block Rate Water Budgets*

**Kenneth Baerenklau** (University of California, Riverside), [ken.baerenklau@ucr.edu](mailto:ken.baerenklau@ucr.edu)

Coauthors: Kurt Schwabe (University of California, Riverside), Ariel Dinar (University of California, Riverside)

*Market Structure and Energy Efficiency Regulation: the Case of Clothes Washers*

**Anna Spurlock** (Lawrence Berkeley Lab)  
[caspurlock@lbl.gov](mailto:caspurlock@lbl.gov)

*Evaluate the Impact of Voluntary Program on Promoting Energy Efficient Technology*

**Rong Zhou** (University of Connecticut)  
[rong.2.zhou@uconn.edu](mailto:rong.2.zhou@uconn.edu)

Coauthor: Kathleen Segerson (University of Connecticut)

**AERNA VI CONGRESS OF THE SPANISH-  
PORTUGUESE ASSOCIATION OF  
RESOURCE AND ENVIRONMENTAL  
ECONOMICS**

**September 4 – 6, 2014**

**Faculty of Economics and Business Sciences**

**University of Girona**

**Girona, Spain**

The conference program will cover all areas of environmental and resource economics, ranging from topics prevailing in the general debate, such as climate change, energy sources, water management and ecosystem services evaluation, to more specialized subjects such as biodiversity conservation or persistent organic pollutants. The congress will be held at the Faculty of Economics of the University of Girona, located in a city quarter situated just few minutes from the city center, conveniently connected by bus lines L8 and L11.

Deadline for registration: **June 10, 2014**

Website:

<http://www.udg.edu/jornades/VICongresoAerna/Inici/tabid/20617/language/en-US/Default.aspx>

**ALLIED SOCIAL SCIENCE ASSOCIATIONS  
(ASSA)  
ANNUAL MEETING**

**January 3 - 5, 2015**

**Boston, Massachusetts**

The **2015 Annual Meeting** will take place in Boston, Massachusetts on January 3 - 5, 2015. The headquarters hotel will be the Sheraton Boston.

AERE will sponsor sessions at the 2015 winter meeting of the ASSA and will hold a members' luncheon and Fellow's Talk on January 4th. The AERE Program Committee is organizing the AERE sessions. The Call for Papers is now closed.

Website: [http://www.aeaweb.org/Annual\\_Meeting](http://www.aeaweb.org/Annual_Meeting)

**6<sup>th</sup> ATLANTIC WORKSHOP ON ENERGY  
AND ENVIRONMENTAL ECONOMICS  
(AWEEE)**

**June 25 – 26, 2014**

**A Toxa, Galicia, Spain**

The Atlantic Workshop on Energy and Environmental Economics (AWEEE) is a biennial scientific meeting, born in 2004, which is organized by Economics for Energy with the collaboration of the Centre for European Economic Research (ZEW). The workshop has become an important outlet for the discussion and debate on state-of-the-art research on energy and environmental issues, with a limited number of participants who come from all around the world. The AWEEE combines keynote lectures on specific topics by prestigious academics with the presentation of research by invited speakers and by other participants through an open call for papers.

The AWEEE takes place in the pleasant island of A Toxa, in the Northwestern Spanish area of Galicia. In its sixth edition the workshop will deal with Frontiers in the Economics of Energy Efficiency.

Website: <http://www.eforenergy.org/toxa>

**2014 Belpasso International  
Summer School on Environmental  
and Resource Economics**

**August 31 – September 6, 2014  
Belpasso, Italy**

**Spatial Context and Valuing Natural Capital for  
Conservation Planning**

The Department of Agri-food and Environmental Systems Management (DiGeSA) at the University of Catania, with the support of the European Association of Environmental and Resource Economists (EAERE) and the BC3 Basque Centre for Climate Change, organizes the Belpasso International Summer School on Environmental and Resource Economics. The broader objective of the Belpasso International Summer School is to provide advanced training for young researchers who are also EAERE members from all over Europe and beyond on European issues of environmental and resource economics. The School is hosted in the city of Belpasso, in the Province of Catania, Sicily, Italy.

Deadline for Applications: **May 30, 2014**

Website: <http://www.belpassosummerschool.it/>

**EAERE 21<sup>st</sup> Annual Conference**

**June 24 – 27, 2015  
Helsinki, Finland**

Organization: EAERE and University of Helsinki

For conference information, e-mail: [eaere@eaere.org](mailto:eaere@eaere.org)

**EAERE 22<sup>nd</sup> Annual Conference**

**June 22 – 25, 2016  
Zurich, Switzerland**

Organization: EAERE and Swiss Federal Institute of Technology (ETH) in Zurich

For conference information, e-mail: [eaere@eaere.org](mailto:eaere@eaere.org)

**9<sup>th</sup> Annual Green Economics  
Institute Conference**

**July 9 – 11, 2014  
Science and Economics Faculty  
Oxford University**

**Creating an Economic and Democratic  
Spring and Summer**

**Sustainability, Resilience and Survival  
Economic Recovery and Reform in the Face of  
Privatization, Globalization and  
Massive Trade Blocks**

This conference explores the very latest thinking in global change and social and environmental justice and science and also provides professional accreditation and training for people coming together to think right outside the box and to create policy change together for the global economy and local communities.

Website: <http://www.greeneconomics.org.uk/>

**INTERNATIONAL CHOICE MODELLING  
CONFERENCE 2013**

**May 10 – 13, 2015  
University of Texas at Austin  
Austin, Texas**

The International Choice Modelling Conference brings together leading researchers and practitioners from across different areas of study, with presentations looking both at state of the art methodology as well as innovative real world applications of choice models. Following on from the success of the third Conference held in Sydney 2013, the fourth International Choice Modelling Conference will be organized jointly by the Center for Transportation Research (CTR) at The University of Texas at Austin and Resource Systems Group, Inc. (RSG).

Website:

<http://www.icmconference.org.uk/index.php/icmc/icmc2015>

**NORTHEAST AGRICULTURAL AND  
RESOURCE ECONOMICS ASSOCIATION  
(NAREA) ANNUAL MEETING**

**June 1 - 3, 2014  
Waterfront Place Hotel  
Morgantown, West Virginia**

The Northeast Agricultural and Resource Economics Association (NAREA) will hold its 2014 annual meeting at the Waterfront Place Hotel in Morgantown, West Virginia, on June 1 - 3, 2014. NAREA will sponsor selected paper sessions, symposia, plenary talks, and workshop paper sessions. The post-conference workshop on non-conventional gas energy resources and related issues will be held immediately after the annual meeting beginning at noon on June 3 and concluding on June 4 after morning tours of a Marcellus Shale well-pad or other energy-related field trip

Conference Website: <http://www.narea.org/2014/>

**SOUTHERN ECONOMIC ASSOCIATION  
(SEA)**

**November 22 - 24, 2014  
Marriott Marquis Atlanta  
Atlanta, Georgia**

*AERE Sessions at the Southern Economic  
Association (SEA) Annual Meeting*

AERE members will be participating in the Southern Economic Association's (SEA) annual meeting at the Marriott Marquis Atlanta Hotel in Atlanta, Georgia, on November 22 - 24, 2014. John C. Whitehead (Appalachian State University) organized the SEA sessions which are intended to provide an accessible conference option for our regional members. The list of papers will appear in the November 2014 *AERE Newsletter*.

Website: <http://www.southerneconomic.org>

**WESTERN ECONOMIC ASSOCIATION  
INTERNATIONAL (WEAI)  
89<sup>th</sup> ANNUAL CONFERENCE**

**89th Annual Conference**

**June 27- July 1, 2014  
Grand Hyatt Hotel  
Denver, Colorado**

Please note that because the dates conflict with the WCERE, there are no AERE sessions at the 89<sup>th</sup> annual WEAI conference this summer. Click [here](#) for more information about WEAI.

**2<sup>nd</sup> WORKSHOP ON NON-MARKET  
VALUATION**

**June 25 – 26, 2014  
Aix-En-Provence, France**

The main objectives of this workshop are to provide a forum for dissemination of high quality papers in the field of non-market valuation and to animate a network of people that will meet every year.

Deadline for registration: **May 11, 2014**  
E-mail: [wonv2014@idep-fr.org](mailto:wonv2014@idep-fr.org)

# ESSAY

## The Delphi Method as a Tool in Amazon Rainforest Valuation

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### Introduction

The World Bank is carrying out a research project that aims to assess, with greater precision, the value of preserving the remaining rainforests of the Amazon region. In this nine-country region in South America, 60% of the rainforest is contained within Brazil; Peru and Colombia together encompass another 25%. Preserving this forest may have substantial economic value, not only to local and regional populations, but also to global populations outside of South America. Such global values include, perhaps most obviously, the value of the Amazon rainforest as a carbon sink to mitigate possible future climate change. Most of the carbon stored in the Amazon is lost with deforestation because alternative land uses lead to far lower biomass density. Carbon can be valued by multiplying the amount stored in the forest by the avoided global damage cost per unit of carbon not released to the atmosphere. Such an assessment is conceptually straightforward, although exact values are highly uncertain.

Many other potential global economic values are associated with the Amazon, however. They include recreation and ecotourism for external visitors, products harvested sustainably from the forest (including pharmaceuticals), and nonuse or passive-use values (including existence and option values). These value components are the main subject of this paper. Compared to carbon, they are far more complex and more difficult to assess. As part of the World Bank's work to value them, we intend to conduct several stated preference (SP) surveys of random population samples in North America (Canada and the United States), Europe, Japan, and Latin America (Brazil, Colombia, and Peru). The first of these surveys will be carried out later this year for North America.

As is the norm, extensive preparatory work underlies these surveys, including focus groups and pilot tests within each region. It has also included an unusual element: application of the "Delphi method." This

method was developed by researchers at the RAND Corporation in the 1950s and 1960s as an interactive forecasting tool that relies on expert panels.<sup>1</sup> It has a long background and tradition as a management decision tool. To the best of our knowledge, it was first proposed as an environmental valuation method in the early 1980s (Hufschmidt et al. 1983) but has, we believe, been applied only once by environmental economists in a published valuation study (an application to a cultural heritage site, the Fez Medina in Morocco; see Carson et al. 2013).

In this article, we report preliminary results of our experience with the Delphi method.<sup>2</sup> We conducted Delphi exercises involving environmental valuation experts from 37 countries across four continents. In these exercises, we asked the experts to predict the results of a hypothetical contingent valuation (CV) survey on Amazon forest protection administered to the populations of their home countries; the key predictions were household mean and median willingness to pay (WTP) for the protection plans described in the CV scenario. We conducted four exercises—one each in Europe, North America, Oceania, and Asia. A total of 217 experts participated: 49 from Europe (from 21 countries), 82 from North America (the United States and Canada), 16 from Oceania (Australia and New Zealand), and 70 from Asia (Bangladesh, Cambodia, China, India, Indonesia, Malaysia, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and Vietnam). The exercises were administered via email during 2012 (Europe) and 2013 (the other regions).

All of the experts in our four Delphi exercises were presented with the same two CV scenarios, in English.<sup>3</sup>

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<sup>1</sup> See Dalkey and Helmer (1963); Linstone and Turoff (1975).

<sup>2</sup> Note that specific results for Europe have already been reported, in Navrud and Strand (2013).

<sup>3</sup> Some modifications were made to the order and phrasing of background information and scenario descriptions in the case of the

The scenarios highlighted the effects of forest protection on species preservation. We described this scenario as being part of a hypothetical population survey aimed at eliciting WTP for Amazon forest protection by households in the expert's home country. We then asked the experts to predict the mean and median WTP estimates they thought would be obtained if the survey scenarios were actually administered to a representative sample of their country's population.

Our conjecture, still being evaluated, is that information from these exercises can serve various purposes. One is to use the distribution of the experts' WTP predictions as a formal prior distribution in planning more efficient experimental designs (Ferrini and Scarpa 2007). The experts' responses help to define both where the prior should have support and where any probability masses are likely to be concentrated. A second and more ambitious purpose is to provide a basis for a "relative calibration" of noncarbon values across countries. After we have completed the population-based SP surveys, we will have both Delphi estimates and actual WTP estimates for some countries. A comparison of these two sets of estimates will help us determine (a) if predictions from the Delphi exercises can be used to assess population WTP levels for countries for which we have no direct estimates from population-based SP surveys and (b) whether and how the Delphi estimates need to be calibrated for such use.

Because many leading environmental valuation experts participated in the Delphi exercises, we also had an opportunity to obtain their feedback about various design features for the population-based SP surveys. We asked them about likely problems and other issues they perceived with the survey instrument and its possible implementation in their countries.

### **The Exercises and Their Results**

The experts who participated in our Delphi exercises were presented with two hypothetical forest protection plans to be valued: a more costly and comprehensive plan, A, which would lead to no further forest loss by 2050, and a less costly plan, B, in which 12% of the current Amazon forest would be lost by that time. Both plans were compared to a "business-as-usual" (BAU), or "no-plan," alternative under which 30% of the current Amazon rainforest would be lost by 2050.<sup>4</sup> Required annual payments per household were in the form of a national tax to help fund the protection plans, which

would remain in force only as long as payments continued. We also assumed that individual country governments would decide whether to institute such a tax and that a protection plan would go into force only if the funds raised were sufficient to cover the corresponding cost.

The exercises were administered in two rounds in each of the four regions. In round 1, each expert was asked to predict mean and median annual WTP by households in his or her country for plan A and plan B. The round 1 predictions were compiled, and the frequency distributions, mean values, and median values were determined. This summary information was reported back to the experts at a regional level for Europe, by country income group in Asia (where countries are grouped as, low, lower-middle income or upper middle income), and by country in North America and Oceania. Each expert received this summary information only for his or her region (for Europe), income group (for Asia), or country—not for the others. The experts then had the option to adjust their WTP predictions in round 2 in light of this summary information on the overall group response. Each expert thus provided four numbers in each round: mean and median household WTP in his or her home country to implement plan A, and corresponding predictions for plan B.<sup>5</sup>

The use of multiple rounds of predictions is typical of Delphi exercises. While this procedure may be viewed as biasing experts' answers in round 2 toward the mean value in round 1, the idea is that the provision of information on the overall group response may be helpful in reaching a consensus, if one exists, without involving explicit group dynamics and without creating pressure to arrive at a consensus if one does not exist. Incentives for experts to participate were provided through a small gift for each expert who completed both rounds, in a manner similar to those provided by some organizations for reviewing grant proposals and some publishers for reviewing book proposals.

Table 1 presents selected features of the exercises by country, including the number of experts, the round 2 average of mean WTP for (the more comprehensive) plan A, and per capita gross domestic product (GDP) in both standard and purchasing power parity (PPP) terms. Mean WTP varies considerably across countries, from \$114 in Norway to \$4–\$5 in Cambodia, Nepal, and Croatia. A pattern whereby WTP is increasing in per capita GDP seems quite obvious. A similar pattern was also found for the other WTP measures (i.e., median

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Asian exercise to make the information more easily understood for the many nonnative English speakers in the sample.

<sup>4</sup> The standard BAU scenario is taken from Soares-Filho et al. (2006).

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<sup>5</sup> In addition, European experts were asked to provide similar numbers for Europe as a whole.

**Table 1. Distribution of Experts, their Mean WTP, and GDP, by Country and Groups of Countries**

<b>Country group (number of experts)</b>	<b>Country (number of experts)</b>	<b>Stated mean WTP for plan A, round 2, US\$/household/year</b>	<b>GDP (PPP- adjusted), US\$/capita/year, 2012</b>
Non-Europe OECD countries (98)	United States (71)	67.7	50,000 (50,000)
	Canada (11)	90.2	52,200 (42,500)
	Australia (9)	44.9	67,000 (44,600)
	New Zealand (7)	24.7	37,700 (32,200)
Low-income Asian countries (6)	Bangladesh (1)	10.0	800 (1,900)
	Cambodia (1)	4.0	1,000 (2,500)
	Nepal (4)	4.2	700 (1,500)
Lower middle- income Asian countries (40)	India (10)	23.8	1,500 (3,900)
	Indonesia (6)	6.2	3,600 (5,000)
	Pakistan (3)	11.0	1,300 (2,900)
	Philippines (11)	6.5	2,600 (4,400)
	Sri Lanka (2)	36.5	2,900 (6,200)
	Vietnam (8)	5.8	1,600 (3,600)
Upper middle- income Asian countries (24)	China (6)	23.4	6,200 (9,200)
	Malaysia (11)	31.5	10,400 (17,100)
	Thailand (7)	18.9	5,500 (9,800)
Nordic countries(11)	Denmark (2)	49.0	70,000 (43,900)
	Finland (3)	34.5	
	Norway (3)	114.2	
	Sweden (3)	40.4	
Northern and Central Europe(18)	Austria (2)	78.2	48,900 (39,800)
	Belgium (1)	61.2	
	Germany (3)	102.0	
	Ireland (2)	32.6	
	Netherlands (3)	40.8	
	Switzerland (2)	30.6	
	United Kingdom (5)	31.8	
Southern Europe (12)	France (3)	47.6	36,200 (31,600)
	Greece (2)	10.9	
	Italy (4)	22.1	
	Portugal (1)	27.2	
	Spain (2)	31.3	
Eastern Europe(8)	Croatia (2)	5.0	15,700 (21,300)
	Czech Republic (2)	27.2	
	Hungary (1)	5.4	
	Poland (2)	27.2	
	Romania (1)	34.0	

*Notes:* OECD, Organisation for Economic Co-operation and Development.

WTP instead of mean WTP, round 1 instead of round 2, plan A instead of plan B).

This relationship between WTP and national income is of particular interest to us. Based on a very preliminary econometric analysis, the elasticity of predicted mean WTP with respect to per capita GDP as conventionally measured is in the range 0.6–0.7, while the elasticity with respect to per capita GDP in PPP terms is close to unity. Our valuation work would be simplified if a unitary elasticity assumption were a reasonable approximation, as we could then assess aggregate WTP for a large set of countries by simply multiplying the estimated WTP per dollar of GDP from population-based SP studies in a smaller number of countries by aggregate GDP for the more inclusive country group.<sup>6</sup> Further econometric analysis is required before we can state with confidence that the elasticity is indeed unitary or close to this level.

We stress that little is currently known about WTP for programs to protect the Amazon rainforest among the populations of countries outside of South America. Two previous population CV studies that shed some light on such values are Kramer and Mercer (1997) and Horton et al. (2003). Kramer and Mercer asked a sample of US households about their WTP for protecting 5% of all rainforests *globally* (thus not specifically in the Amazon) as a *one-time* payment; they found mean WTP in the range of \$21–\$31 per household (in 1995 dollars). Horton et al. (2003) found higher numbers from convenience samples of people interviewed at a variety of outdoor location sites including parks and beaches in their CV survey in several cities in the United Kingdom and Italy in 1999—around \$45 per household *per year* for a program to protect 5% of Amazonian rainforests in Brazil (and \$60 for a more extensive program that would protect 20%). Apart from design issues, these differences could reflect differences in preferences between European and US populations or differences in sample selection. They could also signal a rise in public attention to or concerns regarding rainforest issues between the early 1990s and early 2000s.

Two other results from our initial analysis are relevant here. First, more experts adjusted their mean WTP estimate for plan A downward (65 experts) than upward (40 experts). In addition, the downward adjustments were somewhat larger than the upward ones. As a result, round 2 mean WTP estimates are lower on average. Second, WTP estimates for plan B, which was the less

ambitious protection plan, were fairly similar to those for plan A except that they were, generally, scaled down by 25%–35% (relative to numbers in Table 1). This indicates that the experts believed that the results of the CV studies in their countries would be sensitive to scope.

## Conclusions

If the results from our Delphi exercises are taken literally, they indicate that the annual WTP per household to preserve the current Amazon rainforest—and avoid a BAU scenario implying 30% forest loss by 2050—is about \$70 in North America, about \$40–\$50 in Europe, and lower in Asia. Perhaps one of the most useful features of these Delphi results is that they may help establish a relationship between mean WTP per household and per capita income across countries. Considering the cross-section of the 37 countries in our Delphi exercises, mean WTP is approximately proportional to average per capita GDP when the latter is measured in PPP terms. This suggests that such relative values could potentially be transferred rather easily to countries outside of our sample, but we caution that our econometric analysis is yet very preliminary. In addition, of course, we need to compare the Delphi results to those from the full-fledged population-based SP surveys that we will conduct in individual countries before we will have evidence on whether experts' predictions need to be calibrated before they can be interpreted as population estimates. Our first population-based survey, which will be done in the United States and Canada, is scheduled for completion later this year. It should provide the first-ever evidence on how well Delphi exercises can predict the outcome of population-based SP surveys.

The Delphi method is a virtually untried technique in environmental valuation, and it is still an open question as to whether it is useful for providing preliminary assessments of population WTP for global public goods when carried out in different countries. What should be clearer and less controversial, is that our use of it has provided information and advice that has substantially improved the survey instrument to be used in the population-based SP surveys. The distributions of the experts' mean and median WTP predictions for the protection plans should provide a good initial basis for work on the experimental design for our upcoming surveys. Mobilizing the collection of this sort of information would have been difficult outside of something that looked like our Delphi exercise. One of the greatest needs is in the area of benefit transfer, where the estimated income elasticity of WTP (Flores and Carson 1997) can play an important role. The information we have collected from our experts gives us some hope that we will be able to make reasonable

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<sup>6</sup> This simple benefit transfer procedure would assume that mean WTP is determined solely by country income expressed as GDP per capita. Though clearly a simplification, this might provide order-of-magnitude estimates.

inferences about countries we are unable to survey in deriving an estimate of the global value for a plan to help protect one of the world's best known, most important, and most threatened natural resources.

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## Claiming Environmental Damages in the *Prestige* Oil Spill Court Case (Spain)

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### Abstract

The trial of the *Prestige* oil spill (October 2012-July 2013) provided the opportunity to claim for the first time compensation for environmental damages in Spain. The present essay summarizes briefly the experience of presenting a stated preference based environmental damage assessment report in a European court case, which corresponded with the largest environmental accident happening in Europe in the last 15 years. In spite of what it has been considered by the Spanish society as a disappointing verdict, by which the jury did not find any of the accused parties guilty of negligence or wrongdoing, the present trial does set a precedent in Spain. With the admission into court and defense of a contingent valuation study in court for the first time in Spain, it may become itself a hopeful event in order to open the door to a more standard use of stated preference valuation methods in damage claims in Europe, and hopefully around the world.

### 1. Introduction

The trial of the *Prestige* oil spill brought the opportunity to claim environmental damages for the first time in the practice of environmental law in Spain. The prosecutor office used the non-use value estimates published by Loureiro, Loomis and Vazquez (2009) in *Environmental and Resource Economics*, in order to claim the intangible environmental losses (non-use values) caused by the spill to the Spanish society. This was the first time in Spain for claiming non-use values in an environmental accident using an academic research piece, and adding to the few cases in Europe where judges allowed contingent valuation estimates into a trial process. The present essay summarizes the experiences of presenting an environmental damage assessment report in the European court case corresponding with the largest environmental accident happening in Europe in the last 10 years. To this end, I will first sketch briefly the history of case of this oil spill; then, I will continue with a description of the complete damage assessment that computed societal losses in 4328 million euro (including both, use and non-use damages, being the latter reported in Loureiro, Loomis and Vazquez (2009)); concluding with my

views on the hearing, and summarizing the final verdict.

### 2. The *Prestige* Oil Spill: Messy Waters

On November 13, 2002, the single-hull 26 year-old oil tanker, *Prestige*, suffered a serious accident just 46 kilometers away from the Finisterra Cape, in the Northwest of Galicia (Spain). The *Prestige* had a complicated parentage. It was owned by a Liberian company, registered in the Bahamas, and was operated by a Greek captain with a Filipino and Greek crew. It carried about 77,000 metric tons (MT) of heavy low-quality oil. Six days after the accident, and after traveling without a clear direction outside the Atlantic coast of Galicia, the *Prestige* sank 222 Kilometers away from the Cies Islands on November 19, 2002, after splitting in two during a storm (Loureiro et al., 2006).

On its way to the bottom of the sea it spilled more than 60,000 MT of oil, polluting more than 1,300 kilometers of the Spanish coastline. The spill was the most serious environmental accident ever suffered in Spanish waters. It began in November 2002 and lasted for about 4 months, affecting the coasts of Northern Portugal, Northern Spain (particularly Galicia) and Southern France.

From the earlier stages of the accident, human actions have helped mitigate on many ways the impact and extension of the spill. Of particular relevance has been the rapid and energetic response of the affected communities. Before specialized personnel arrived to the scene of the accident, and while many TV channels and printed media were still denying the importance of the spill, fishermen and shellfish producers established nets around the beaches and shellfish production platforms, while trying to fight the expansion of the oil with home-made tools. Such early actions proved to be crucial to reduce economic damages in fisheries and call the spill to the attention of the general public. Fishermen's abandonment by the responsible authorities got the attention of many citizens that were willing to travel from multiple points in Spain to participate in the cleaning operations in the coast, creating the largest movement of volunteers ever in Spain.

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\* Maria Loureiro wishes to thank Prof. John Loomis for his excellent comments on earlier drafts of this paper.

During the catastrophe, more than 12,000 volunteers participated in the cleaning operations. Their white cleaning suits gave them the name of the “white tide” of volunteers in contrast to the “black tide” produced by the spill. Such collaboration by the civil society in the “white tide” has been studied extensively by social psychologists in order to understand the largest manifestation of altruistic behavior we ever had in Spain.

While in general, the Galician coast marine ecosystems were already overexploited for some species, the *Prestige* oil spill had pushed more species towards their collapse. Such destructive effects on commercial fisheries were not entirely detectable right after the reopening of fishing bans, although these became observable after several months after the spill. In addition to commercial fisheries, marine mammals and birds were heavily affected. In January 2003, the Spanish Society of Ornithology and Birdlife estimated that the number of birds killed by this oil spill was between 65,000–130,000, which would make the *Prestige* the second worst oil spill in history with respect to the number of killed birds (Loureiro et al., 2006). The next section describes briefly the structure of the environmental damage report produced by request of the prosecutor office that entered into trial.

### 3. The Damage Assessment Report

The objective of this damage assessment presented as an expert report by the prosecutor office was to quantify the total economic value lost in the Northern Coast of Spain from 2002 to 2006 caused by the *Prestige* oil spill. As customary, this total economic value included both, economic and environmental damages. Therefore, the estimated losses related to the primary economic sectors, such as the fishing and shellfish sectors, the canning industry, and those occurring in the tourism sector were included. Additional losses occurring in other inter-related sectors (backwards and forward transmission effects) were computed via an input-output analysis. Costs borne by the Spanish and French governments (through Ministries, Autonomous Communities, and municipalities) in the cleanup and restoration operations were also accounted for. In addition to these economic damages, the assessment also included non-use values or environmental damages caused by the *Prestige* oil spill estimated by Loureiro, Loomis and Vázquez (2009). All the above losses and expenses were expressed in 2012 monetary terms, to be consistent with the time when the request for compensation of damages was presented to the court. The total sum of all these previous concepts expressed in 2012 prices, and subtracting the sum already paid

by The International Oil Pollution Compensation Funds (IOPC Fund)<sup>1</sup> amounted to 4.328 million euros.

#### 3.1 The Environmental Damage Assessment: A Contingent Valuation Method (CVM)

Like the Exxon Valdez study, we valued the damages from the *Prestige* spill in Spain by estimating the willingness to pay (WTP) to avoid another similar sized spill in Spain (See Loureiro, Loomis and Vazquez, 2009 for details). Therefore, the first survey section introduced the possibility of a future oil spill episode like the one caused by the *Prestige*, if no preventive measures were to be put in place. Once this was stated, a show card with a proposed program to avoid future oil spills in Spain was presented to participants. The program was specially designed for its initial application in the Atlantic and Cantabrian coasts of Spain. This program was depicted as part of a broader strategy conducted by the EU to avoid marine pollution. The program description identified several management actions: a) proper training of personal for surveillance and emergency tasks; b) inspection and surveillance of maritime traffic in all Cantabric and Atlantic coasts of Spain using escort ships that would travel along the coast. Inspection would be done by escort ships that would be also able to sanction the tankers that cause accidental oil spill or those which do not properly follow the established procedures; c) a rapid and qualified response in emergency situations, using professionals and tools to prevent the oil spill from spreading. The escort ship would throw special booms that would immediately encircle any ship that was leaking oil. These booms were about two meters high above the sea level and other two meters below the sea level. Given that the oil floats on water, in the days after the accident, the booms could keep the oil from spreading. The oil kept inside the boom could be suctioned up into tankers that are part of the escort ships. We indicated that similar systems had been employed successfully in the North Sea and in Alaska during the Exxon Valdez oil spill.

Next, based on scientific predictions of damages, individuals were shown the difference between the expected environmental damages in the next seven years with and without the proposed program. This time frame was chosen because it reflected at the time, on average, the frequency of important oil spills in the Northern Spanish coast. Therefore, the difference between the expected damages with and without the described program will allow us to understand the

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<sup>1</sup> The International Oil Pollution Compensation Funds are three intergovernmental organizations (the 1971 Fund, the 1992 Fund and the Supplementary Fund) which provide compensation for oil pollution damage resulting from spills of persistent oil from tankers ([www.iopcfunds.org](http://www.iopcfunds.org)) in most countries around the world.

effectiveness of the proposed measures in terms of reducing the environmental damages.

These effects were explained with the help of graphic information displayed in a show card. Respondents were told that if the program was approved that all segments of society and industry would be contributing to the payment of the program, specifically including oil companies, which should pay a proportion of the program implementation associated costs relative to their profits.

Next, the following willingness to pay question (WTP) was presented. This was in the form of a voter referendum, offering the program implementation if they would vote to pay a specific one time increase in taxes. The referendum WTP question for the oil spill prevention and response program in Spain was the following (where the monetary bid amounts varied across the sample):

It is expected that this program is in full operation in 2010. If the application of the escort ship program described above would cost your household xx€-, would you vote in favour to pay this amount just <u>one single time (say in the next tax declaration)</u> to reduce the damages described from the oil spill to the nature and fauna by oil spills?		
YES .....1	NO .....2	DON'T KNOW ..... 3

#### 4. Presenting the CVM Results at Court

The presentation and defense of the damage assessment took place on May 21, 2013, during 8.5 hours. In terms of use values or economic damages reported in the assessment, and as expected, plaintiff lawyers showed a very positive and unified approach. Lawyers representing the affected parties (Spanish government, fishermen associations, industries, and other third parties) applauded the assessment and showed no critical concern or remark, employing the main conclusions and findings on their best interests, in order to back up the need for compensation of their clients.

However, the lawyer from the IOPC Fund (the compensating agency responsible to pay the damages caused) was more critical with several aspects of the study. He started his round of questions by assuring “*I am going to be more belligerent than my previous colleagues....*” The IOPC Funds lawyers only questioned the validity of the economic losses, ignoring the environmental damage claim as a whole. The reason for that defense strategy was that the IOPC Funds<sup>2</sup> do not cover non-use or environmental damages as such, restricting their compensation scheme to direct economic damages. As a consequence, the CVM assessment was of no interest to the Fund. The major and recurrent issue covered in his questions was the causality link between the effects of the occurrence of the spill and the persistence of

economic damages (particularly over time and after fishing bans were lifted) in the various sectors which were analyzed. (“*Are all these damages really really caused by the Prestige oil spill? And what about....?*”) Although statistical regressions showed a clear causal relationship between the accident and claimed damages for the sectors studied with micro-data, remarks were often made about the need to control for additional variables not included in the regressions, which at times were well beyond the scope of the current objectives.

The IOPC Fund had an alternative assessment of fishery losses, excluding any other losses caused to fishermen by the loss of reputation of their products. Their fisheries study contained a very conservative estimation of the damages occurring only while the fishing bans were imposed. Compensations for fishery losses were much discussed in this court session, due to the fact the IOPC Fund (currently the 1992 IOPC Fund) only covers fishing ban periods, being exceptional the coverage of additional posterior losses. In the case of the *Prestige* oil spill it was shown that a clear stigma effect occurred in affected areas, reducing considerably the Galician fish prices. Such stigma had a negative impact not only on local markets, but also on export markets for several species in which this region was a world leader, such as mussels farming. After the spill, international markets substituted the Galician products around the world and the excess supply was used by the local canning industry.

The part that dealt with the non-use values or environmental losses was covered after the break, and the lawyer representing the owner of the ship (Mare Shipping Inc.) asked the all of questions related to the CVM study.

<sup>2</sup> The 1992 Fund Claims Manual states under chapter 1.4.13. “Compensation is not paid in respect to claims for environmental damage based on an abstract quantification calculated in accordance with theoretical models. Nor is compensation paid for damages of a punitive nature on the basis of the degree of fault of wrong-doer.”

The questions about the CVM study were multiple; all hinting to the fact that stated preference methods may not be reliable in terms of representing real passive use damages (referred as “moral damages” in the current Spanish legislation). The lawyer had a structured questioning strategy, which corresponded with the sections of the survey. First, the information section of the survey about the damages caused by the spill (although not questioned in terms of the accuracy of the figures and magnitudes presented) was portrayed as a “*brain wash*” section (although not directly said). The sentiment was that anyone would feel the need to contribute to the program described earlier to prevent oil spills after hearing the damages caused by the spill. This may happen even though in reality, voters for a given legislation or environmental issue may not have that much information about what they are voting for when a real referendum takes place. The recurrent nature of the damages presented was also questioned. In our survey, it was shown that every seven years an oil spill has occurred in this coast, carrying damages similar to those portrayed in the survey. Although this cyclical issue was true at the moment of writing the survey, right after the *Prestige* oil spill several deterrence measures and EU policies were put in place to prevent the occurrence of very large oil spills from happening. The lawyer indicated that we had no suffered any large oil spill in the past 11 years in this coast. The lawyer considered exaggerated this cyclical dimension, and had to be reminded about multiple small spills occurring every day in this coast line and in addition to other fatalities occurring in the coast of France.

The section that described the program was also questioned on several grounds. A second point that generated much discussion was the effectiveness of the program presented in order to prevent or reduce the impact of future oil spills. The documented success rates of similar oil spill prevention programs were said to occur in Alaska and the Northern Sea. The lawyer made clear that such areas are quite different from our area of study. And consequently, these success rates may not be applicable to this specific case. Furthermore, she suggested that when presenting the program in such a successful way, this could shift public perceptions, and it may generate a larger proportion of affirmative responses than otherwise would be obtained if local success rates were employed. She was reminded that even if we wanted to use success rates from Spain, such program did not exist at the present time. In addition, the payment mechanism which was articulated as a one-time payment collected via income taxes, and later allocated into a fund, so as to generate sufficient revenues over time to fund the oil spill prevention program, was portrayed as not being credible. The lawyer suggested this was a very artificial way to finance infrastructure

or public policies by the government. My response was that although not frequently used, there are funds applied in Spain and around the world to combat for example the climate change problem. The final issue which was discussed was the fact that our social damage estimate was based on the social mean WTP and not the social median WTP previously computed in the Exxon Valdez. The lawyer questioned why we were so true to the Exxon Valdez study (Carlson et al., 2005) and praised so much its methodology, if we depart from this study employing a mean estimate instead of a median estimate. (The use of the mean in our case generated higher WTP values). She was told that the accepted and correct manner for computing societal damages is done via aggregation (of individuals) with respect to the mean. Consequently, the lawyer tried to reduce the credibility of the CVM study on several grounds.

This mean/median question was the last question she had. No other questions were asked by any of the more than 30 lawyers attending that day. And I was finally dismissed.

## 5. The Verdict

The verdict was made public on November 13, 2013; just on the 11<sup>th</sup> anniversary of the spill. In spite of the great expectation generated, the final resolution, however, did not acknowledge the existence of such relevant economic and environmental damages. It only analyzed whether the accused (the captain of the tanker, the first official, and the former general director of the Spanish Marine Affairs) were guilty of negligence or wrongdoing. The four judges concluded that none of the three accused individuals were guilty of wrongdoing or negligence causing the oil spill. The captain of the tanker, however, was found guilty of disobedience of orders given by the Spanish authorities during the first moment of the rescue efforts. However, the jury did not find any relationship between his actions and the large (or potential incremental) environmental damages occurring from the oil spill. Given the nonexistence of responsible parties, then the damages were not even discussed by the judges nor their potential compensation. This was mainly due to the fact that none of the accused parties was financially responsible to pay for them.

The public manifestations of discontent with the sentence were quite general, with the exception of the three accused, who showed their satisfaction with the sentence via their legal representatives. This sentence has been appealed by the Spanish government, the prosecutor office, and the citizens’ platform *Nunca Más (Never Again)* to the Spanish Supreme Court. However, it may take up to 5 or even 10 additional years for the Spanish Supreme Court to resolve this

cumbersome case. This implies an extraordinary waiting time for the victims and society as a whole to be compensated for the damages suffered. In addition, also practitioners will be kept in limbo regarding the usefulness of our stated preference methods in courts around the world. However, in the meantime, what we have now at least is a precedent of the use of CVM in a very relevant court case of Spain, which may open doors for future damage claims based on stated preference methods. This is already a significant progress. Antonio Machado, poet and worldwide leading figure of the Spanish literature in the twentieth century wrote “Walker, there is no path. The path is made when walking...” Hopefully, this is also true in the case of environmental damage claims in Europe.

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### MESSAGE FROM THE EDITOR OF *JEEM*

Dear AERE Members:

Since AERE withdrew its support of *JEEM* and its previous editor, Dan Phaneuf, moved to *JAERE*, I have become the new managing editor for *JEEM*. I have put together a well balanced team of highly respected environmental and resource economists from Europe and North America. In alphabetical order the new co-editor team consists of:

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The editorial team also represents the different fields of environmental and natural resource economists. In the future we plan to also recruit co-editors from other parts of the world. The aim of *JEEM* is to continue publishing high quality research in environmental and natural resource economics, covering both theory and empirical work. As in the past, *JEEM* also welcomes interdisciplinary work focusing on environmental and natural resource economics issues, where methods from other disciplines are used to address research questions that require expertise beyond the economics paradigm. For an update of *JEEM*'s aims and scope, look [here](#).

Elsevier and the new editorial team are grateful for the efforts of Dan Phaneuf and the excellent group of co-editors with whom he has worked. Those who will be stepping down include:

**Andreas Lange (University of Hamburg, Germany)**

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**Michael Roberts (University of Hawaii, USA)**

**Quinn Weninger (Iowa State University, USA)**

**Andrew Yates (University of North Carolina, USA)**

**Matt Cole (University of Birmingham, UK)** also worked with Prof. Phaneuf and will stay on as a co-editor during the transition. On behalf of the profession, Elsevier and the new *JEEM* editorial team thank each of these individuals for their years of service to *JEEM*.

Awareness of environmental problems and interest in environmental policy continue to grow. This is reflected by an expanding market for research dissemination in environmental and resource economics, which we believe is large enough to accommodate multiple top journals in the field. As such, the *JEEM* editorial team looks forward to a good relationship with *JAERE* as well as other field journals in environmental and natural resource economics. We look forward to working with the global community of environmental and natural resource economists and a continued cordial relationship with AERE.

**Till Requate**

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