

# **IRIS GROSSMANN, Ph.D.**

Center for Climate and Energy Decision Making, Carnegie Mellon University  
5000 Forbes Ave, Pittsburgh, PA 15213, USA

Email: [irisg@andrew.cmu.edu](mailto:irisg@andrew.cmu.edu), phone: (412) 268-5489, cell: (412) 897-8289

Website: <http://www.epp.cmu.edu/httpdocs/people/bios/grossmann.html>

## **Research and Teaching Interests**

Impacts of climate change and large-scale natural variability on human and environmental systems, adaptation strategies for human and environmental systems, Atlantic hurricane forecasts, water resources in a warming world, renewable energy policy and planning, sustainable cities and natural resource conservation.

Tools include: climate model projections and statistical analysis, decision and policy analysis, systems thinking and modeling, cost-benefit analysis, scenario development, workshops for environmental policy analysis, surveys, expert and stakeholder interviews and expert elicitations, and Geographic Information Systems (GIS).

## **Education**

- 2005 Ph.D., Geosciences/Meteorology, University of Hamburg and International Max Planck Research School on Earth System Modeling (IMPRS), Hamburg, Germany (Committee: Hans von Storch, Carlo Jaeger).
- 2001 Master/ German Diplom, Mathematics with minor in Operations Research, University of Hamburg, Germany.
- 1998 Vordiplom (German undergraduate degree) in Mathematics with minor in Physics, University of Hamburg, Germany.

## **Professional Experience: Academic Positions**

- 2007- Postdoctoral research fellow, Climate Decision Making Center and Center for Climate and Energy Decision Making, Carnegie Mellon University, Pittsburgh, PA. Researched and published on: assessment of climate change impacts and climate risks from natural variability, climate adaptation strategies, renewable energy policy and planning, and economic risks from uncertain emissions policies.
- 2006-07 Postdoctoral research fellow, Institute of Coastal Research, Helmholtz Center Geesthacht (formerly GKSS Research Center), Germany. Conducted survey of stakeholders' views on climate change and environmental conservation at the German North Sea and Baltic coasts.
- 2006 Research Associate, Institute of Coastal Research, Helmholtz Center Geesthacht, Germany. Researched and published on cost-benefit aspects of port development in Hamburg (Germany) and on methods to systematically include discontinuous change into scenarios.
- 2002-05 Assistant scientist, Institute of Coastal Research, Helmholtz Center Geesthacht, Germany. Conducted interdisciplinary assessment of risks and perspectives for the Greater Hamburg region (PhD thesis): sustainability in the city of Hamburg in the context of the ongoing revitalization of the urban environment and changing costs

and benefits of the city's port, policy strategies for conservation of the Elbe river ecosystems, and changes in storm surge risks.

### **Teaching Experience**

- 2008-11 Advised doctoral candidate Kelly Klima on a decision-analytic investigation of hurricane modification and mitigation techniques (with M. Granger Morgan, Wandi Bruine de Bruin and Kerry Emanuel). Kelly defended on Sept. 13, 2011
- 2011 Taught undergraduate project class on trends in the US vehicle fleet across environmental, economic and safety measures (jointly with Paul Fischbeck).
- 2010 Taught undergraduate project class on stakeholder risks and benefits of the Marcellus Shale and identification of policy responses (jointly with Baruch Fischhoff). This class received the "Annual Stephen Lee Award for Outstanding Engineering & Public Policy Project Class".
- 2010 Co-taught undergraduate class "Climate Science and Policy" with Peter Adams.
- 2009-10 Advised graduate statistics student Star Ying on advanced data analysis of precipitation variability in the US Southwest (with Jay Kadane).
- 2008-09 Advised graduate statistics student Anne-Sophie Charest on advanced data analysis of trends in Atlantic hurricane data (with Jay Kadane and Surya Tokdar).
- 2006 Guest lecturer, M.S. Program in Environmental Management, University of Kiel, Germany: taught scenario development in project course on energy scenarios; taught systems thinking skills and facilitation of workshops for policy analysis in course "Project Management and Supporting Tools".
- 2006 Visiting lecturer, Institute of Social Ecology, Faculty for Interdisciplinary Research and Education, University of Vienna, Austria: Taught graduate course "Integrated and participatory methods in Social Ecology" on policy tools including policy analysis workshops and scenario development.

### **Professional Experience: Non-academic Positions**

- 2005 (May-October): Intern, Upaya Zen Center, Santa Fe, New Mexico. Participated in social service, educational programs, restoration of Southwestern grasslands in areas invaded by cheatgrass.
- 1999-02 Part-time assistant, Computer Sciences Corporation Consulting (CSC), Department of Business profile and culture, Kiedrich, Germany. Assisted during consulting workshops, completed weeklong training in workshop facilitation at the CSC Academy.
- 2000-01 Part-time software developer, ArtStor Inc., Hamburg, Germany (Java, Linux).

### **Journal Articles**

Klima, K., Lin, N., Emanuel, K., Morgan, M.G., **Grossmann, I.** Hurricane modification and adaptation in Miami-Dade county, Florida. *Environmental Science and Technology* (in press).

Klima, K., Bruine de Bruin, W., Morgan, M.G., **Grossmann, I.**, 2011. Public perceptions of hurricane modification. *Risk Analysis* (in press), DOI: 10.1111/j.1539-6924.2011.01717.x

**Grossmann, I.**, 2011. Review of “Informing Decisions in a Changing Climate” by the National Research Council. *The Quarterly Review of Biology* (in press).

Klima, K., Morgan, M.G., **Grossmann, I.**, Emanuel, K., 2011. Does it make sense to modify tropical cyclones? A decision-analytic assessment. *Environmental Science and Technology* 45 (10): 4242-4248.

Tokdar, S., **Grossmann, I.**, Kadane, J., Charest, A.-S, Small, M., 2011. Impact of beliefs about Atlantic tropical cyclone detection on conclusions about trends in tropical cyclone numbers. *Bayesian Analysis*, 6 (4): 1-22.

**Grossmann, I.**, Morgan, M. G., 2011. Tropical cyclones, climate change, and scientific uncertainty: What do we know, what does it mean, what should be done? *Climatic Change*, DOI: 10.1007/s10584-011-0020-1.

Grossmann, W.D., **Grossmann, I.**, Steininger, W.K., 2010. Indicators to determine winning renewable energy technologies with an application to photovoltaics. *Environmental Science and Technology* 44 (13): 4849–4855.

**Grossmann, I.**, Klotzbach, P., 2009. A review of North Atlantic modes of natural variability and their driving mechanisms. *Journal of Geophysical Research-Atmospheres* 114, D24107, doi:10.1029/2009JD012728.

Grossmann, W.D., Steininger, K.W., **Grossmann, I.**, Magaard, L., 2009. Indicators on economic risk from global climate change. *Environmental Science and Technology* 43 (16): 6421–6426.

**Grossmann, I.**, 2009. Atlantic hurricane risks: preparing for the plausible. *Environmental Science and Technology* 43 (20): 7604–7608.

**Grossmann, I.**, 2008. Perspectives for Hamburg as a port-city in the context of a changing global environment. *Geoforum* 39: 2062-2072.

**Grossmann, I.**, 2007. Critical and strategic factors for scenario development and discontinuity tracing. *Futures* 39: 878-894.

**Grossmann, I.**, Woth, K., v. Storch, H., 2006. Localization of global climate change: Storm surge scenarios for Hamburg in 2030 and 2085. *Die Küste* 71: 169-182.

**Grossmann, I.**, 2006. Three scenarios for the greater Hamburg region. *Futures* 38 (1): 31-49.

### **Technical publications:**

**Grossmann, I.**, 2007. Climate change and the insurance industry. *Risk Management Review* of the Wharton Risk Center, Spring 2007, Philadelphia, PA, 2 pp.

Bray, D., Stelljes, N., **Grossmann, I.**, Rau, S., 2007. Perspectives for German coastal regions according to administration and regional stakeholders. *GKSS-Report 2007/19*, GKSS Research Center, Geesthacht, Germany, 51 pp.

**Grossmann, I.**, 2004. Modeling socio-economic change and its consequences for the environment-economy-interrelationship. One out of three invited student contributions to the *Proceedings of the Summer School on Integrated Regional Impact Studies in the European North*, ZUFO-Berichte 2, Münster, Germany, 12 pp.

## **Projects in Progress**

*5-14 day Atlantic hurricane forecasts:* Currently available hurricane forecasts provide either an outlook over the extended range of several months, or predict how a storm may develop during the next few hours or days. We use statistical predictors to assess the probability that 1) a portion of the Atlantic basin will be favorable for tropical cyclone (TC) formation and 2) a developing TC will spend a certain period at major status on the scale of 5-14 days. This can be used to, e.g., inform short-term reinsurance products (“live cat”). With Phil Klotzbach (Tropical Meteorology Project at Colorado State), Gero Michel and Angelika Werner (Willis Research Network), Granger Morgan (CMU), and Renato Vitolo (Exeter University).

*Hurricane risks to offshore wind farms:* This project uses a probabilistic model to estimate hurricane risks to offshore wind turbines near Galveston and off the North Carolina coast (with Stephen Rose, Paulina Jaramillo, Mitchell Small, and Jay Apt).

*Climate impacts and vulnerability to the combined effect of global warming and multidecadal variations:* Impacts from global warming may have a long emergence time; however, both human and natural systems can be highly vulnerable when global warming impacts combine with other stresses. This includes natural climate variations, in particular on the multidecadal scale. During decades dominated by certain large-scale atmosphere-ocean patterns the probability of weather extremes can be several times higher than averages indicate. I am calculating such “conditional risks” for intense hurricane landfalls and for droughts in the US Southwest. These projections are combined with the projected effect of global warming to enable assessing vulnerability on shorter time scales in order to inform adaptation policies.

*Systems approach to renewable energy planning:* This collaborative project with the Wegener Center for Climate and Global Change at the University of Graz, Austria, evaluates renewable energy perspectives in an interdisciplinary context. Current and recent work targets a) optimizing solar electricity generation across large geographic areas in order to minimize intermittency, b) an application to the design of a Pan-American solar plan with a HVDC grid, b) economic risks due to uncertain emissions policies, c) land demand challenges in a low-emissions society.

## **Selected Recent Presentations**

Symposium “Future Ocean”, “Decision analysis of hurricane modification techniques”, Kiel, Germany, September 2010.

Risk Management Solutions, “Perspectives on Atlantic hurricane risks”, London, UK, December 2008.

Investigators’ Meeting of NSF-funded Centers on Decision Making under Uncertainty, “Perspectives on Atlantic hurricane risks”, Columbia University, New York, April 2008.

Focus the Nation, “Climate change and natural variability: Perspectives for Atlantic hurricanes”, Carnegie Mellon University, Pittsburgh, January 2008.

Munich Reinsurance Department of Geo Risks, “Climate change and natural variability: Perspectives for Atlantic hurricanes”, Munich, Germany, November 2007.

Potsdam Summer Academy (PoSA), “Homeowner insurance in the face of multiple uncertainties”, Potsdam Institute for Climate Impacts Research, Potsdam, Germany, July 2007.

## **Reviewer**

Environmental Science and Policy, Environmental Science and Technology, International Journal of Climatology, Journal of Geophysical Research, Natural Hazards & Earth System Sciences, Paleoceanography, Risk Analysis, University of Mauritius Research Journal.

## **Honors and Memberships**

Member of the Willis Research Network (WRN).

Member of the International Center of Climate and Society, University of Hawaii at Manoa.

High school: Best Abitur (qualification for University entrance) results achieved at the Rudolf-Steiner School Hamburg-Bergstedt, Germany until 1995.

Nominated for the Deutsche Studienstiftung (German National Academic Foundation).

## **Workshop and Event Facilitation**

Organized event “Peace Alive!” for 250 people at Carnegie Mellon University, April 2008.

Organized and facilitated workshop to discuss policy strategies for nature conservation and rural development in the Lower Elbe region (Germany), Institute of Coastal Research, GKSS Research Center, Geesthacht, Germany, November 2003.

## **Non Profit Board Service**

2008- Board member of Olmo Ling Tibetan Bon Buddhist Center and Institute: Assistance in educational program development and fundraising.

## **Languages**

German: native speaker, English: fluent (written and spoken), French: good working knowledge.