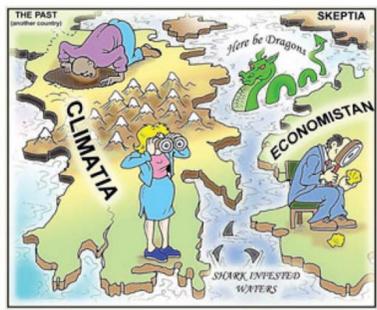


# Surveying the Landscape of Climate Change Research and Facilitating Interdisciplinarity

Jennifer R. Marlon<sup>1</sup>, C. Susan Weiler<sup>2</sup>, and Ronald Mitchell<sup>1</sup>

## Overview



Schmidt & Moyer, 2008, *Nature Reports Climate Change*

Interdisciplinary research is crucial to understanding complex and urgent environmental problems, particularly climate change. Universities are increasingly hosting trans-, multi-, and inter-disciplinary workshops and conferences and developing innovative interdisciplinary training programs (e.g., NSF's IGERT program) to foster such research. Yet, much doctoral training remains highly disciplinary with very little evidence of graduate training producing transformative research that bridges the natural/social-science divide. Indeed, strong cultural and institutional obstacles often deter or preclude doctoral students from conducting such research.

Here we summarize over two decades of climate-change related dissertation abstracts and show that doctoral research on climate change is rapidly increasing. The majority of work has been in the natural sciences, with a smaller proportion (about 20 - 25%) in the social sciences. An increasing amount of research is now occurring in engineering, education, history, and other fields.

DISCCRS (pronounced "discourse") -- the Dissertations Initiative for the Advancement of Climate Change Research -- is an NSF-funded career-development program for new Ph.D.s. DISCCRS promotes interdisciplinary research on climate change that spans the natural and social sciences.

## Why Interdisciplinarity?

- Human-environment interactions that were historically restricted to local or regional scales are now occurring globally and with more severe environmental and human consequences than ever before.
- Environmental scientists have traditionally examined physical and biological processes in environments where humans were absent, and social scientists have conventionally focused on human interactions without much consideration of environmental contexts or importance.
- All aspects of climate change -- its causes, impacts, and solutions -- involve elements and interactions embedded in coupled human-natural systems.
- Understanding and responding to climate change requires communication and cooperation between scientists, policy-makers, industry, and the public.
- Disentangling the scientific complexities of human-environment interactions in an interdisciplinary context is critical for developing integrated strategies for managing our environmental support systems.

(Adapted from Liu et al. (2007) *Ambio* 36(8), p. 639-649)

Most climate change research focuses on the natural causes & impacts of warming; Research on its social, political, cultural, and economic aspects accounts for less than 1/3 of the total and the proportion is not increasing.

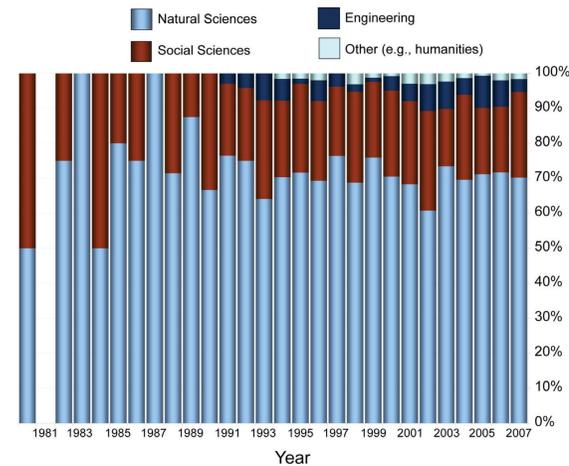


Fig. 1: Changes in the proportion of different types of climate change research by Ph.D. students over recent decades. Dissertations were identified by searching the ProQuest UMI® database for the terms "climate change" and "global warming" in the title, keywords, and abstract fields of Ph.D. dissertations. The database includes dissertations from the U.S., Canada, Britain, and other European countries.

First Dissertation on Climate Change Models:  
1982 - by Patrick H. Wyant  
"Some Simple Models for Climate Change"

First Dissertation on Climate Change Impacts on People:  
1983 - by Diana Liverman  
"The use of a simulation model in assessing the impacts of climate on the world food system"

Research on climate change across the natural and social sciences is increasing. According to a recent NSF study, little of this research is interdisciplinary, although defining and thus measuring interdisciplinarity is very difficult.

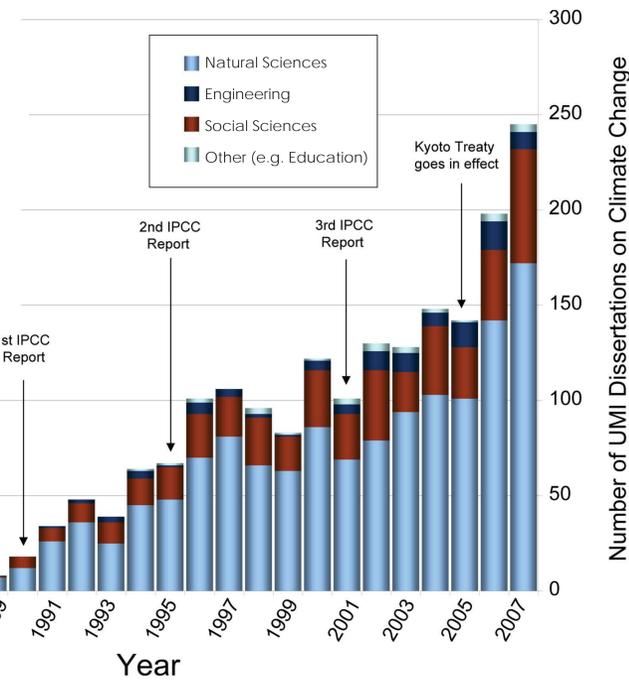


Fig. 2: Changes in the number of climate change-related dissertations from 1980 to 2007 based on the ProQuest UMI® database using the same method described in Fig. 1. Data for the most recent years are incomplete and so are not included. The proportion of natural science research to other fields has remained relatively constant over time, despite a growing awareness that the greatest uncertainty about future climate change and its impacts relates to human behavior -- how individuals, institutions, and nations will respond to the threat.

DISCCRS participation is increasing as interest in climate-change research grows.

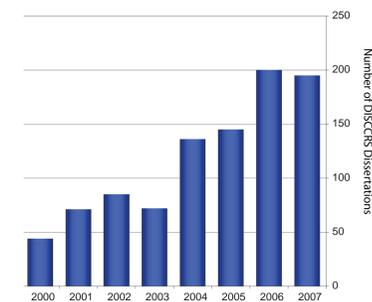


Fig. 4: All climate change dissertation abstracts compiled from the disccrs.org online registry. The registry was initiated in 2002 (entering dissertations completed prior to 2000 was discouraged).

## DISCCRS ("discourse")

The *Dissertations Initiative for the Advancement of Climate Change Research* (DISCCRS) is built on the premise that successful interdisciplinary scholarship begins with a core area of expertise and grows with the development of connections among disparate disciplines.



DISCCRS V Symposium Participants. From back left to bottom right: Jarrett Byrnes, Abraham Miller-Rushing, Jeremy Brooks, Evan Givertz, Alex Ruess, Jeff VantLooy, Andrew Gieshop, Kim Cahill, Charles Wilson, Shannon Heggerman, Jonathan Overpeck, Jana Heister White, Joshua Elliott, Bob O'Connor, Michael White, Brian Fisher, Ming-Ying Xie, Netra Chhetri, Marcolita Gallegos, Oliver LeDore, Hannah Brenken-Smith, Heather McCarthy, Lingli Liu, Abigail Anthony, Sarah Henkel, Alexandra Pometto-Gonzalez, Shantzen At, Ian Buck Sanford, Sue Weiler, Ron Mitchell, Jennifer Marlon, Dan Feldman, Jessica Blok, Becca Barnes, Stephanie Wilton, Sarah Hill, Genevieve Patenaude, Caroline Ummerhofer, Amanda Carrico, Skina Jinnah, Ryan Emanuel, Susan Hassol.

The aim of DISCCRS is to foster such interdisciplinary work by connecting new researchers who are striving to integrate knowledge from multiple disciplines and develop creative solutions to problems relating to climate change.



### Climate Ph.D. Dissertation Registry

DISCCRS.org stores dissertation abstracts from over 1000 early-career climate scholars from 82 countries. The registry is continually growing and is fully searchable.

### Weekly Electronic Newsletter

Climate news, funding opportunities, interdisciplinary jobs and more are delivered to your inbox weekly. Email [info@disccrs.org](mailto:info@disccrs.org) with "request DISCCRS newsletter" on the subject line to get on the mailing list.

### Professional Resources for Interdisciplinarians

DISCCRS.org has resources for interdisciplinary early career development, including those developed for the international DISCCRS leadership symposia.



### Leadership Symposia

Annual Symposia bring together interdisciplinary cohorts of early career climate scholars who are competitively selected to represent future leaders in the area of interdisciplinary climate research spanning the natural and social sciences. The goal is to broaden perspectives and establish a collegial peer network to address climate challenges at the interface of science and society. See [disccrs.org](http://disccrs.org) for information on past symposium scholars, resources and reports from past symposia, plus application instructions for the DISCCRS VI Symposium to be held in fall 2011.

## DISCCRS Sponsors

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Ecological Society of America (ESA)  
American Political Science Association (STEP/APSA)  
The Oceanography Society (TOS)  
U.S. Society for Ecological Economics (USSEE)

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Email [info@disccrs.org](mailto:info@disccrs.org) to receive our weekly e-newsletter!

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