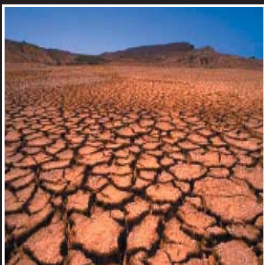




2006 Annual Report



■ Overview

Center Mission

The mission of the Natural Hazards Center at the University of Colorado at Boulder is to advance and communicate knowledge on hazard mitigation and disaster preparedness, response, and recovery. Using an all-hazards and interdisciplinary framework, the Center fosters information sharing and integration of activities among researchers, practitioners, and policy makers from around the world; supports and conducts research; and provides educational opportunities for the next generation of hazards scholars and professionals.

Table of Contents

Mission	2
2006 in Brief	3
In Memoriam - Gilbert F. White	4
Outreach and Community Building	5
Branding and Product Enhancement	6
Annual Workshop	7
Information Services	8-9
Research	10-11
Awards and Honors	12
Financial Summary	13
Advisory Committee	14
Staff	15

Annual Report

This annual report covers the period from October 2005 to September 2006. It briefly summarizes the specific projects and programs that the Center has engaged in over the past year, but, as with any summary, it does not fully capture the range and depth of activities undertaken. To more fully explore the Center, its mission, products, and programs, visit our Web site at www.colorado.edu/hazards/.

- Center founder, friend, and mentor Gilbert F. White died peacefully on October 5, at his home in Boulder, Colorado. He was 94 years old.
- The Center's Web site, *Observer* newsletter, letterhead, and logo were redesigned to provide uniform branding. The changes allowed the Center to make other valuable updates to some of its most visible and frequently used resources.
- Special publication #40, *Learning from Catastrophe: Quick Response Research in the wake of Hurricane Katrina*, a peer-reviewed, edited volume was published in November 2006.
- Twenty-five Quick Response research projects were activated in the wake of Hurricanes Katrina and Rita, the largest number of activations in the program's 20 year history.
- Nearly 450 people attended the Annual Workshop, the largest attendance in its 31 year history.
- The November 2005 *Natural Hazards Observer* was the largest ever, published at 36 pages. Distribution reached a record 15,848 individuals and organizations by September 2006.

By the Numbers - 2006

1,100,000 - Annual Web hits

33,000 - Library items

16,000 - Subscribers to the *Observer*

3,700 - Subscribers to *Disaster Reserch* e-newsletter

500 - Subscribers to Disaster Grads Listserv

450 - Attendance at the annual, invitational workshop

■ In Memoriam - Gilbert F. White

We can be confident that action which is in accord with a few basic beliefs cannot be wrong and can at least testify to the values we will need to cultivate. These are the beliefs that the human race is a family that has inherited a place on the earth in common, that its members have an obligation to work toward sharing it so that none is deprived of the elementary needs for life, and that all have a responsibility to leave it undegraded for those who follow.

- G.F.W.

Gilbert F. White, known to many as founder of the Natural Hazards Center, the father of floodplain management, and a leader in natural hazards research and the world environmental movement, died on October 5, 2006, at his home in Boulder, Colorado. He was 94.

White's landmark work, which began with his 1942 dissertation *Human Adjustment to Floods*, challenged the notion that natural hazards are best addressed by engineering solutions. Instead, he argued that the havoc wrought by floods and other natural disasters may be better avoided by modifying hu-

man behavior. He advocated, where feasible, adaptation to or accommodation of flood hazards rather than the structural solutions that dominated policy in the early twentieth century.

He promoted understanding, respect, and protection of natural resources and the natural order, including inevitable extremes. In a word, he championed stew-

ardship—preserving nature and promoting sustainable use and husbandry of the natural resources of the earth. While White's ideas were initially greeted with controversy, he was a persistent advocate. After six decades, his proposals for floodplain management and flood insurance reform have won widespread acceptance.

The underlying notion that humans should adjust to their environment, coupled with a deep commitment to improving human welfare through social policy, guided White's career. A quiet leader, his work encompassed not only floods and other natural hazards, but water management in developing countries, global environmental change, geographic education, and international cooperation on water systems, including in the Middle East and the Mekong and Nile river basins.

Most recently, White was Gustavson Distinguished Professor Emeritus of Geography at the University of Colorado (CU) at Boulder, a position he held since 1980. From 1970 to 1978, he was a professor of geography and the director of the Institute of Behavioral Science at CU, and, in 1976, he founded the Natural Hazards Center, which he directed from 1976 to 1984 and again from 1992 to 1994. Prior to joining CU, White served in the New Deal administration of Franklin D. Roosevelt, where, among other things, he reviewed proposed natural resources legislation and presented summaries to the president; was president of Haverford College; and was professor and chair of the Geography Department at the University of Chicago.

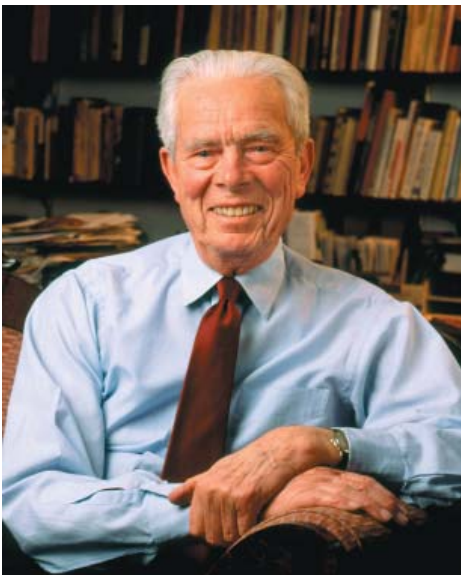


Photo: University of Colorado

■ Outreach and Community Building

The hazards community is composed of a broad spectrum of constituents from local and state emergency managers to hazards researchers in multiple disciplines to private sector vendors and business continuity planners, among many, many others. The core of the Center's mission is to create and sustain this community through networking, community building, and information dissemination. Center projects and products are purposefully designed to allow new constituencies to feel welcomed and included.

Congressional Outreach

In the wake of Hurricanes Katrina, Rita, and Wilma, the Center began a new outreach effort aimed at members of Congress and their staff. With disaster management issues at the forefront of the national policy debate and vital questions about the state of federal emergency capabilities it became more important than ever that national leaders be introduced to the wealth of knowledge and experience that existed before the catastrophe. In June, the Center, in partnership with the Hazards Caucus Alliance and the American Sociological Association, prepared a congressional symposium on critical issues in hazards social science research. Although prohibited from actively lobbying Congress, the Center will continue to educate legislators and provide resources and assistance to the Congressional Research Service when requested.

Conferences, Workshops, and Seminars

In an effort to reach new constituencies—primarily local practitioners—the Center adopted a new model for conference attendance and outreach that will be expanded in the future. By entering into reciprocal relationships with other conference organizers, the Center was able to attend practitioner-oriented venues, such as the American Planning Association and International Association of Emergency Managers' annual conferences, while simultaneously recruiting new invitees to the Center's workshop and other events.

Center staff also participate in dozens of additional seminars, symposia, workshops, and conferences around the country to forge lasting relationships with scholars, policymakers, and local and state officials.

Hosting Visitors and Researchers

Frequently throughout the year the Center will host distinguished visitors. Many people come to make use of the library's vast resources, nearly 32,000 items, while others seek advice or collaborative partnerships. In 2006, representatives from several federal agencies, including the Government Accountability Office (GAO), the US Geological Survey, and the Federal Emergency Management Agency (FEMA), as well as from academic institutions around the country. Foreign dignitaries, scholars, and officials also spent time with Center staff. On occasion researchers will spend extended periods, sometimes several months, using the Center's resources in order to complete or complement their ongoing research or dissertation work.

■ Branding and Product Enhancement

With a diverse set of information resources and products developed over the course of our 31-year history, the Center was challenged to create a new, uniform design standard. The proliferation of hazards and disaster research centers and institutes, particularly since 9/11, also necessitated a bold new look that would be instantly recognizable to the new members of the hazards community.

Logo

Most people identify the Center stylistically by the signature four-square icon of hazards. With such instant recognition, it was critical to incorporate the existing design elements into the new look. Through the use of color and by updating the graphic style itself, the new logo honors the past while providing a compelling, fresh look. The logo also ties the Center's name directly into the graphic in order to help make the Center more recognizable to users and constituents.

What is in a logo? The redesign on the left achieved more than a new, fresh look, it also maintained an important historical link. The Center is recognized worldwide for the high caliber of its products, its vital mission, and the credibility of its information.



Web Site

The Center's Web site is a central node of information for the hazards and disasters community. Providing access to the library's database, free on-line copies of the *Observer*, updates on the Center's other activities and programs, information on current research, and links to hundreds of external resources, the site contains an enormous wealth of information. By taking advantage of the need to unify the design of the Center's products and programs, a complete redesign of the site achieved two additional goals: improved user navigation and a reorganization of the resources to better reflect recent changes in the hazards and disasters community.

Several important new features are also planned. A new resource specially targeted to practitioners will highlight case studies and provide recommended contacts and important links on specific issues. Another feature will expand the boundaries of the existing Web site to include seminars, blogs, and downloadable video and audio clips

Observer Newsletter

For its 31st birthday, the *Natural Hazards Observer*, the Center's marquee information dissemination product, received a facelift and minor reorganization. The added use of color and some specific new design elements draw the reader to specific resources or announcements and enhanced graphics give the product a fresh new look. Traditional features such as On the Line, the Invited Comment, and other major sections will remain the same.

■ Annual Workshop

The Center's annual workshop has an international reputation as a driving force in the hazards field. The workshop is designed to bring together members of the hazards research and applications communities (researchers, practitioners, policy makers, government officials, and individuals from nongovernmental organizations and the private sector) together for face-to-face networking and discussion about current issues and trends that affect how society deals with hazards and disasters. It provides a dynamic, provocative, and challenging forum for the diverse opinions and perspectives of the hazards multidisciplinary community.

This year's workshop addressed issues of profound importance for the hazards community and our society as a whole. With the last two years characterized by numerous truly catastrophic events, such as the 2004 Indian Ocean Tsunami, the recent South Asian Earthquake, and Hurricane Katrina, it is clear that significant challenges remain in our efforts to mitigate the impacts of natural hazards.

With nearly 450 participants, the 2006 workshop had the largest attendance in its 31-year history. However, the workshop's intentionally small size allows for networking and active discussion of new research, policies, and tools. Nearly one-third of all attendees participated in panels, ensuring that the practitioners' viewpoints, for instance, are shared equally with those of researchers, federal agency representatives, and members of the private and nonprofit sectors. No other workshop in the world

has accomplished so much in bridging the segments of the hazards and disasters community. It does so through direct interaction that promotes the synergy of activities necessary to achieve meaningful progress in emergency management.

Keynote Addresses

Reflecting a push to include more international perspectives and experiences, the opening keynote was presented by Margareta Wahlström, United Nations Assistant Secretary-General for Humanitarian Affairs. Ms. Wahlström's vast experience in the 2004 Indian Ocean Tsunami relief efforts, aiding Afghan refugees, and coordinating the response to the 2005 Kashmir earthquake gave attendees a global overview of challenges that remain for all societies as they seek to reduce disaster losses. A second keynote by P. Patrick Leahy, acting-director of the U.S. Geological Survey, emphasized the need for increased investment in the science of natural hazards and highlighted many of the USGS's successes and current programs.

Press Coverage

The 2006 workshop also enjoyed a significant amount of press coverage. Local broadcast media took advantage of the concentration of experts and aired a number of segments in the Denver area. *Time* magazine reporter Amanda Ripley also used the workshop to frame her article on American's continuing unwillingness to prepare for predictable and well-documented hazards.

■ Information Services

At the heart of the Center's mission is the belief that the successful transfer of knowledge among different research disciplines, stakeholders, and policy makers will ultimately improve society's resilience to natural disasters. There is an ongoing need for research and cross-disciplinary and societal dialogues on a range of topics, including risk perception, judgments concerning acceptable risk, and strategies for mitigating, preparing for, responding to, and recovering from extreme events of all types.

Natural Hazards Observer

The Natural Hazards *Observer* is the Center's most visible and highly regarded publication. Currently 16,000 subscribers—organizations, libraries, and

individuals—from around the world receive the 28-page newsletter every two months. A recent survey suggests that each issue eventually reaches as many as 37,000 readers. November 2005 and January 2006 were the largest issues ever at 36 pages and 32 pages, respectively, and were expanded to include additional Katrina-related content.

Available in both hard copy and online, the *Observer* features an on-the-line article showcasing practical applications of new techniques by a practitioner, an invited comment, an update on U.S.-based policy developments, notification of awarded research grants, and lists of new publications, Web sites, and conferences.

Disaster Research E-newsletter

The *Disaster Research* e-newsletter (*DR*) complements the *Observer*. The *DR* often contains time-sensitive information that the *Observer* cannot and features timely announcements about new policies and programs, funding opportunities, calls for papers and presentations, upcoming conferences, Internet resources, job openings, and other information useful to researchers, practitioners, and policy officials. For the one year anniversary of Hurricane Katrina, a special issue *DR* featured a listing of the commemorative reports, articles, and Web pages devoted to the catastrophe. The *DR's* circulation has increased steadily and now reaches over 3,800 recipients every two weeks.

Special Publications: Learning From Catastrophe

A peer-reviewed and edited volume, *Learning from Catastrophe* features a collection of 18 chapters from 39 researchers who conducted social science research during or immediately after Hurricanes Katrina and Rita made landfall on the U.S. Gulf Coast in September 2005. Research teams were deployed under the Center's own Quick Response program, the National Science Foundation's Small Grants for Exploratory Research (SGER) effort, or through support of other various academic institutions.

Much of disaster research must by necessity be carried out in the aftermath of major events and it is therefore essential that each opportunity be seized to learn the appropriate lessons. The devastation and social and institutional failures wrought by Hurricanes Katrina and Rita, unfortunately, provided ample fodder for quick response research. Quick response studies are also important because such studies frequently result in the identification of research questions for future, longer-term research. Disasters inevitably bring surprises, and quite often those surprises turn into researchable topics.

Because of the multiple severe impacts and the utter devastation caused by Hurricane Katrina, rapid response field work was especially challenging—perhaps more so than in any recent U.S. disaster. Field workers witnessed catastrophe and its depredations firsthand and are now bringing the human story of Katrina to a wider audience through the publication of this edited volume.

Library

With more than 32,000 items in the collection, the library is the backbone of the Center's information program. The online database, *HazLit*, allows patrons to search the extensive collection from anywhere in the world. Although the collection is largely nonlending, the library hosts dozens of visitors each year for periods ranging from a few hours to several months.

Because the library is such a critical resource for so many people, in 2006 library staff became part of a network composed of librarians and resource collection managers from the U.S., United Kingdom, and New Zealand whose collections focus on risk, environmental issues, and natural hazards and disasters. The goal of this new network is to build cooperative partnerships, share knowledge, and exchange information between the libraries involved.

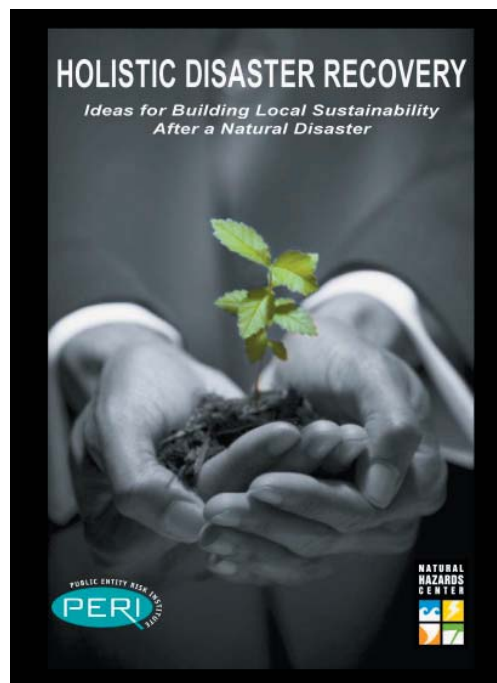
Natural Hazards Review

The Center, in partnership with the American Society of Civil Engineers, cosponsors the *Natural Hazards Review*—the first journal to bring together all fields of policy and research applicable to natural hazards loss reduction. The journal, now in its sixth year of production, highlights cross-disciplinary approaches to studying and managing hazards, blending engineering, regulatory and policy sciences, and the social, behavioral, and physical sciences to address hazards loss reduction.

Holistic Disaster Recovery Update

The Center revised the 2001 handbook *Holistic Disaster Recovery: Ideas for Building Local Sustainability after a Natural Disaster*. The new version contains updated resources, including a more specific focus on the Hurricane Katrina recovery, and new examples of recovery success stories. The document's text was streamlined to make it easier to use and more practical for those managing recovery decisions and activities on the ground.

With funding from the Public Entity Risk Institute (PERI), the Center originally created the handbook to communicate the idea that for effective, long-term disaster recovery, communities must incorporate as many principles of sustainability—environmental quality, economic vitality, quality of life, social equity, citizen participation, and disaster resiliency—into their recovery processes as possible.



In the aftermath of Hurricanes Katrina and Rita, the Center updated *Holistic Disaster Recovery* to include fresh case studies and updated resources for local officials and organizations involved in the long-term recovery of the Gulf Coast. Katrina, more than any education program, brought home the need to build back better, using progressive, sustainable land use planning and projects.

■ Research

Center-affiliated faculty and staff also engage in separately funded research projects and other programs that are consistent with the Center's mission. One of the main goals of the Center's in-house research program is to ensure that students associated with the Center receive hands-on research training on multidisciplinary projects. Many of the leading hazards researchers who are active today were trained at the Center, and Center personnel continue to take leadership roles in education and training activities. Reflecting the Center's position that various disciplines must work together in order to develop holistic analyses of extreme events, research activities involve extensive multidisciplinary collaboration.

START

The Center is a core participant in START—the National Consortium for the Study of Terrorism and Responses to Terrorism—a recently established U.S.

Department of Homeland Security (DHS) academic center of excellence headquartered at the University of Maryland. The Center's roles in START are to conduct research on community preparedness for extreme events and to coordinate START's working group on societal dimensions of terrorism. Working group members include leading researchers in the fields of hazards, disasters, terrorism, and risk, and represent expertise in sociology, social psychology, spatial social science, and human ecology.

The Center is currently conducting research on readiness for terrorism and disasters in the Denver metropolitan area. The main purpose of this research is to understand, from those working at the local level, how new homeland security programs are being implemented. The research will provide insight into the changes that have taken place as a consequence of a regional approach to preparedness and identifies barriers to strategies that may have resulted.

RESCUE-ITR

The RESCUE-ITR project (Responding to Crises and Unexpected Events—Information Technology Research) continues to be a major focus of the Natural Hazards Center's in-house research program. The \$12.5 million grant from the National Science Foundation, which is centered at the University of California's Irvine and San Diego campuses, seeks to develop a better understanding of the factors associated with the adoption and implementation of advanced technologies in emergency management and to provide research-based input into the

Quick Response Research

With funds from the National Science Foundation, the Natural Hazards Center's Quick Response research program offers social scientists small grants to travel to the site of a disaster soon after it occurs to gather valuable information concerning immediate impact and response. The findings of these studies cover a broad range of disasters—both natural and human-caused—in diverse segments affecting all types of human communities.

Hurricanes Katrina and Rita necessitated the largest activation of the Center's Quick Response research program in 20 years, eclipsing the number of activations requested immediately following the events of 9/11. A wide variety of topics was explored, including the looting myth, evacuation decision making, and issues associated with race, class, and gender in the response.

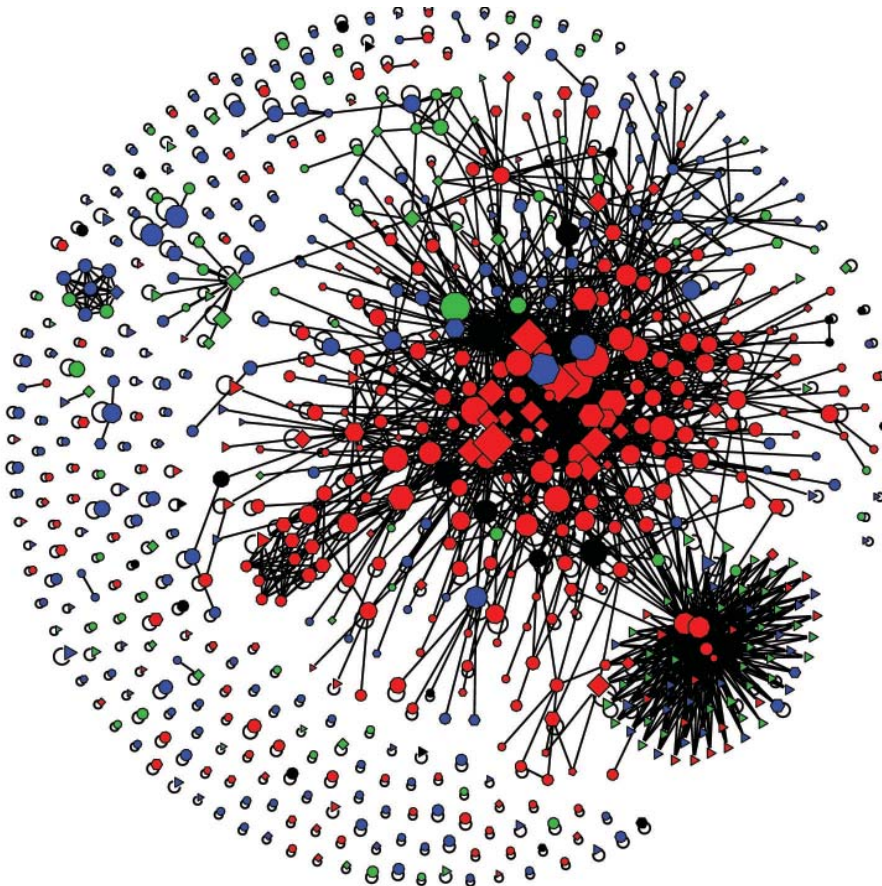
modeling efforts undertaken by other investigators. Current Center RESCUE-ITR research focuses the World Trade Center Emergent Multiorganizational Networks (EMONs) and Policy Information Sharing Architecture (PISA).

The results of the EMON research demonstrate the tendency for similar and dissimilar organizations to interact with each other. Researchers are also examining the distribution of brokerage among organizations. The results of these analyses will allow researchers to better understand which types of organizations were more likely to serve as intermediaries between other organizations in this event.

Researchers have also begun investigating the

temporal and spatial dimensions of an organizational network. The results of this research will provide insight into how an organizational network evolves. The findings will also contribute to the understanding about convergence space and response effort in a localized event.

In addition, the Center was instrumental in planning the Earthquake Information Dissemination Workshop in May. The workshop brought together key researchers, stakeholders, and policy makers to discuss real-time seismic alerts, technological developments, and barriers to implementation. The workshop was crucial in identifying strategic partners for ongoing collaboration.



The network graph represents the involvement of more than 6,600 interactions between 729 government, private, and non-profit organizations involved in the response to the World Trade Center attacks.

■ Awards and Honors

The Natural Hazards Center administers or cosponsors several annual awards to recognize and support individuals contributing to hazards and disasters research and practice. These awards help to advance the Center's mission to provide opportunities for the next generation of hazards researchers and practitioners, to recognize interdisciplinary efforts in the hazards field, and to facilitate interaction among hazards practitioners, researchers, and policy makers.

Student Paper Competition

The Annual Hazards and Disasters Paper Competition for undergraduate and graduate students was created in 2004 to recognize the highly interdisciplinary nature of hazards and disaster research. Submissions may be theoretical arguments, case studies, literature reviews, or descriptions of research results on topics relevant to the social/behavioral aspects of hazards and disasters—natural, technological, or otherwise.

Lindsey Barnes of the University of Colorado at Colorado Springs won the undergraduate category with her paper, *Public Perceptions of Flash Flood False Alarms: A Denver, Colorado Case Study*. Brooke Fisher Liu from the University of North Carolina at Chapel Hill took the graduate honors with his paper, *Preparing the People*.

Mary Fran Myers Scholarship

The Mary Fran Myers Scholarship recognizes outstanding individuals who share Mary Fran's commitment to disaster research and practice and who have the potential to make a lasting contribution to reducing disaster vulnerability. Winners are invited to the Annual Workshop to share their research and experience with practitioners from around the world.

In 2006, three highly qualified and deserving winners were chosen from the largest applicant pool since the award was established. Aurélie Brunie is a PhD candidate in city and regional planning at the University of North Carolina at Chapel Hill who specializes in social capital, collective action, empowerment, and disasters. Elenka Jarolimek is an emergency management specialist at the University of Washington in Seattle. She is currently working on designing a model mitigation program to help departments and college units address seismic and storm-related risks. Alessandra Jerolleman works on mitigation, community outreach, and disaster planning at the Center for Hazards Assessment, Response, and Technology at the University of New Orleans.

Mary Fran Myers Award

The Mary Fran Myers Award was established by the Gender and Disaster Network and is coadministered by the Center. The award recognizes that vulnerability to disasters and mass emergencies is influenced by social, cultural, and economic structures that marginalize women and girls. The award was so named to recognize Mary Fran's sustained efforts to launch a worldwide network among disaster professionals for advancing women's careers and for promoting research on gender issues, disasters, emergency management, and higher education.

Maureen Fordham, who is a senior lecturer in disaster management at the University of Northumbria in the United Kingdom, has a background in sociology of science and technology with a focus on ecology and environmental management. Her work has a special focus on women in disasters and disaster management, emphasizing their capacities and not just their vulnerabilities. Recently she has been focusing her work on children, females in particular, as active agents in disaster.

Funding for the Center comes primarily through a two-year, peer-reviewed grant from the National Science Foundation (Grant number: CMS 0408499). A consortium of federal agencies committed to reducing the nation's vulnerability to disasters supplements the NSF grant on an annual basis. Additional research grants obtained by the Center and affiliated researchers do not contribute to the annual operating budget but instead support the Center's research program. Fully one-third of the Center's annual

revenue goes to the University of Colorado to cover fixed overhead expenses.

Keeping with the traditional that the Center's products and programs should be as accessible as possible to all users, the Center receives little revenue for its publications, workshops, or library usage.

Balance Sheet¹

Income - Operating	2005	2006
U.S. Army Corps of Engineers	\$40,000	\$15,000
Centers for Disease Control and Prevention	25,000	10,000
Federal Emergency Management Agency	200,000	200,000
U.S. Forest Service	20,000	15,660
U.S. Geological Survey	36,540	36,540
National Aeronautics and Space Administration	30,000	30,000
National Oceanic and Atmospheric Administration	265,000	90,000
National Science Foundation	321,789	250,000
Total Contributions	938,329	647,200
Fees and Subtractions		
National Science Foundation Administrative Fee ²	25,895	17,477
University of Colorado, Boulder Grant Overhead ³	286,874	196,566
TOTAL AVAILABLE SPENDABLE	625,560	433,157
Expenses		
Salaries and Benefits	346,208	409,009
Printing and Distribution	78,052	88,941
Travel	6,051	21,491
Library Acquisitions	3,558	6,397
Miscellaneous Operating	18,534	37,570
Quick Response Research Program	11,742	65,609
TOTAL EXPENDED	464,145	629,017

Notes: (1) Two-year NSF award cycle shown. (2) A 4.6% administrative fee is charged by NSF for funds that are transferred from other federal agencies. (3) The grant overhead rate for the budget cycle was 49%.

■ Advisory Committee

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NASA Headquarters

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Institute for Business & Home Safety

Janet Benini
U.S. Department of Transportation

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