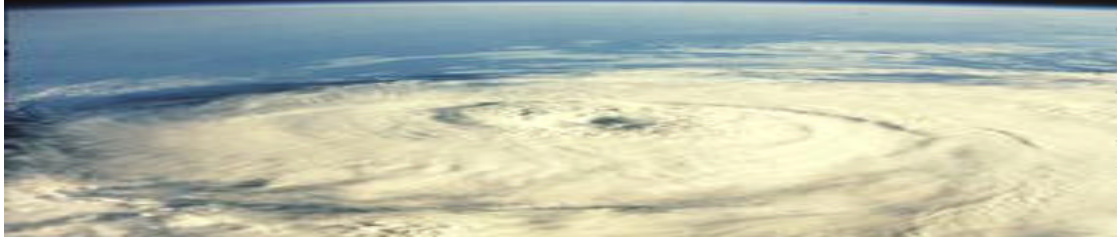

Designing Educational Opportunities for the Hazards Manager of the 21st Century



Workshop Report
October 22-24, 2003
Denver, Colorado
Natural Hazards

BY
DEBORAH THOMAS
UNIVERSITY OF COLORADO AT DENVER
AND
DENNIS MILETI
NATURAL HAZARDS CENTER
UNIVERSITY OF COLORADO AT BOULDER

Working Paper #109



The Natural Hazards Center
University of Colorado
Boulder, CO

**This material is based upon work supported by the National Science Foundation
under Grant No. 0331958 and FEMA's Higher Education Project**

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

TABLE OF CONTENTS

Abstract	3
Introduction	3
Academic, Practitioner, and Government Perspectives	4
Working Groups	5
Core Skills	6
Core Knowledge	7
Balancing Research, Theory, Policy, and Practice	8
Research and Technology Needs	9
Undergraduate & Graduate Curriculum	11
Potential Emergency/Hazards Management Courses	13
Continuing Education Units (CEUs)	15
Certificate Programs	16
Overarching Conclusions	17
Creating and Nurturing the Emerging Discipline	17
Curricula and Course Development	18
Promoting and Supporting the Profession and Professionalization	19
Appendix A: Workshop Agenda	21
Appendix B: Workshop Participants	23
Appendix C: Pre-workshop Document	26
Appendix D: Working Group Guidelines	30
Appendix E: Acknowledgments	33

HAZARD MANAGEMENT HIGHER EDUCATION WORKSHOP

DESIGNING EDUCATIONAL OPPORTUNITIES FOR THE HAZARDS MANAGER OF THE 21ST CENTURY

ABSTRACT

As emergency/hazards management has professionalized, the need for higher education opportunities is ever-increasing. In order to address issues surrounding higher education opportunities for emergency/hazards managers, this workshop was convened on October 22-24, 2003, by the Natural Hazard Center at the University of Colorado at Boulder and the University of Colorado at Denver in partnership with the FEMA Higher Education Project with support from the National Science Foundation (NSF). Fifty-five leaders from the hazards community addressed issues surrounding educational needs in eight working groups: 1) core skill; 2) core knowledge areas; 3) research and technology needs; 4) balancing research, theory, and practice; 5) undergraduate curriculum; 6) graduate curriculum; 7) certificates; and 8) continuing education. In addition to offering perspectives on course and curricula development, workshop outcomes identify a need to nurture the emerging discipline of emergency/hazards management and to promote and support the profession and professionalization.

INTRODUCTION

Recognizing that traditional approaches to emergency/hazard management were unable to meet the challenge of minimizing disaster loss, the process of re-defining the role and skills of emergency/disaster/hazards¹ managers began in the late 1980s and early 1990s. As this professionalization process has continued, the need for higher education opportunities is ever-increasing². In fact, the number of community college, undergraduate and graduate university programs is growing rapidly³. While certainly filling a niche and meeting a need, these programs have

¹ For the purposes of this report, the term hazards manager will be used to denote hazards, emergency, or disaster manager. The term hazard manager itself implies a broader approach to disaster reduction than emergency managers, which denotes an emphasis on response capabilities. Further, disaster manager implies a focus only on disasters, rather than a broader all-hazard approach. However, many are already familiar with the term emergency manager and so there is merit in continuing with this terminology. There was not consensus about the term that should be used at the workshop, but acknowledgement may not adequately capture the expanded role of people in these positions. The term emergency/hazards manager will be used in this report.

² Darlington, JoAnne DeRouen, 1999. "The Profession of Emergency Management: Educational Opportunities and Gaps" Department of Sociology and Anthropology, Western Illinois University. This report of a survey conducted by The Natural Hazards Center on educational opportunities for hazards/emergency management in the U.S. found that large knowledge gaps exist, particularly with a lack of any type of core curriculum.

³ See FEMA's Higher Education Project website for a complete accounting of the emergence of emergency management programs in the U.S. (<http://www.training.fema.gov/emiweb/edu/>).

emerged in a rather uncoordinated fashion, with little professional or academic consensus on core knowledge areas or curriculum content.

In order to address issues surrounding higher education opportunities for hazards managers, this workshop was convened on October 22-24, 2003, by the Natural Hazard Center at the University of Colorado at Boulder and the University of Colorado at Denver in partnership with the FEMA Higher Education Project with support from the National Science Foundation (NSF). Fifty-five leaders from the hazards community gathered in Denver to provide their expertise and perspectives on the topic (see Appendix B for participant list). The participants represent a wide variety of disciplines in academia (engineering, physical and social sciences), as well as innovative practitioners currently working in the emergency management field.

The workshop was designed to begin formulating a national model for emergency/hazards management higher education curriculum and create a framework for educational opportunities (see Appendix A for agenda). Ultimately, discussions centered on how to produce the next generation of hazards managers and provide them with expanded capabilities for tackling disaster reduction. The workshop focused on three primary goals: 1) to identify core competencies for skills and knowledge; 2) to begin to create a sample interdisciplinary curriculum; and 3) to identify possibilities and challenges for incorporating basic hazard management principles into a curriculum. After presentations from the academic, practitioner, and government perspectives, the remainder of the workshop was dedicated to eight working groups. Those in the individual working groups reported back to all participants for general comment. This document summarizes the workshop and presents recommendations for future directions.

ACADEMIC, PRACTITIONER, AND GOVERNMENT PERSPECTIVES

A portion of the first day of the workshop was dedicated to providing an overview of higher education needs from the academic, practitioner, and government perspectives. In addition, research needs to support hazards management were also put forth.

B. WAYNE BLANCHARD, PH.D., DIRECTOR OF FEMA'S HIGHER EDUCATION PROJECT AT THE EMERGENCY MANAGEMENT INSTITUTE, spoke about the goals and objectives of FEMA's Higher Education Project, highlighted activities, and provided an overview of the numbers and types of education programs at institutions of higher education in the U.S. The Higher Education Project is explicitly dedicated to increasing and supporting the study of emergency/hazards management in college and university settings. Thus, this program actively seeks to enhance the emergency/hazards management profession by promoting higher education opportunities. A variety of activities encourage the integration of emergency/hazards management courses into higher education settings through the direct support of course development for higher education in a wide array of disciplines. Further, educational opportunities are offered at the Emergency Management Institute in Emmitsburg, Maryland, including an annual Higher Education Conference. These efforts are increasingly important given the numbers of hazards-related programs emerging at all levels of higher education.

BRENDA D. PHILLIPS, PH.D., INSTITUTE FOR EMERGENCY PREPAREDNESS AT JACKSONVILLE STATE UNIVERSITY, highlighted the challenges facing the field from an academic standpoint. Other recently emerging programs of study, such as women's studies, criminal justice, nursing, social work and public administration, have faced similar challenges as they have professionalized, and they have lessons from which emergency/hazards management can learn. Women's Studies, in particular, has parallels with emergency/hazards management in that it brings together many disciplines around a common theme or issue. It is extremely important to define a given field as well as document an integrative history of its evolution. For the field of emergency/hazards management, a dialog must occur around the correct balance between theory, methods, and practice within the context of

research and teaching. Student experiences and assessments are vitally necessary in building successful programs. Future directions in emergency/hazards management higher education should include an assessment of programs across the country, a concerted effort to train the next generation of educators, and the creation of an emergency/hazards management educators' association. Basic research in hazards management education will also be essential, along with building a body of classroom materials. Emergency/hazards management will be most successful if experiences and materials are shared across programs within and across institutions. Emergency/hazards management must engage in "necessary dialog."

J.R. THOMAS, CEM, DIRECTOR OF FRANKLIN COUNTY OHIO EMERGENCY MANAGEMENT AGENCY AND PRESIDENT OF THE INTERNATIONAL ASSOCIATION OF EMERGENCY MANAGERS, focused on future directions for emergency/hazards management. Without a doubt, the capabilities of individuals and the focus of emergency/hazards management must broaden. It is not just about response, but includes a strong emphasis on mitigation and broader environmental issues. Emergency/hazards management must address all aspects of hazards from environmental clean-up and land use planning to the more traditional role of response. This will require knowledge from a wide variety of disciplines, including criminal justice, the physical sciences, risk assessment, planning, and public health. Further, power generation and transportation centers must be explicitly incorporated into emergency/hazards management. All of this will require a level of coordination and interoperability among a variety of scales (local to regional). The increased capability required of today's emergency/hazards managers necessitates more advanced education and professionalism.

MICHAEL K. LINDELL, PH.D., HAZARDS REDUCTION AND RECOVERY CENTER, TEXAS A&M UNIVERSITY, presented perspectives on research needed to support emergency/hazards management. One of the first requirements is a survey of emergency/hazards managers that addresses all aspects of the job, including the type of person filling these positions, performance demands, and tangible and intangible rewards. This would not only document the current state of employment, but assist in the development of relevant educational programs as well. Three other areas, in particular, require significant research attention for supporting practitioners. Methods for conducting hazard and vulnerability analyses should be assessed and refined, identifying the specific knowledge and skills that emergency/hazards managers would need to conduct them. As an extension of this, many research questions surrounding hazard mitigation measures, including economic viability, using mitigation to effectively break the cycle of loss, and risk communication, must be addressed more thoroughly. In addition, many aspects of disaster recovery and the efficiency of this process also need further attention.

WORKING GROUPS

Prior to attending the workshop, participants were asked to complete a questionnaire that incorporated several discussion themes as a mechanism to have people reflect on the issues prior to the actual workshop (see Appendix C for the worksheet). Each individual received her/his completed form (not everyone's) in the workshop packet for reference. These were the basis of input within the various working groups.

A majority of the workshop was devoted to smaller working groups, which in turn reported to the entire group for comment (see Appendix D for the specific questions each group was asked to address). Two of these groups addressed core skills and knowledge areas associated with hazards management education. Two others focused on research and technology needs and balancing research and practice. Three groups tackled issues of certificate programs, undergraduate, and graduate education. Two ad-hoc groups were also formed during the workshop to specifically look at continuing education and to more clearly define potential courses that might formulate a core hazards management curriculum.

CORE SKILLS

What types of skills should students gain during a higher education program?

Higher education degree programs in emergency/hazards management should foster several skill sets throughout the degree program, whether at the undergraduate or graduate levels. Of course, the capabilities of those finishing a graduate program would be more advanced and refined. The degree level would prepare students for a different job category—for instance, an undergraduate would probably be prepared for an entry-level position if s/he had no additional experience. Many of the skills identified are valuable and desirable for anyone in the workforce. However, emergency/hazards managers, in particular, must have skill sets that include not only the ability to know how to manage hazards, but “people skills” as well. They must be adaptive, creative, and personable in order to effectively perform in the workplace and to interact with people in various other agencies. The following table identifies desirable skills for undergraduate and graduate students at the completion of their degrees:

Undergraduate Skills	Graduate Skills (in addition to undergraduate)
<ul style="list-style-type: none"> • Curiosity • Ability to think creatively • Logical thought process • Self-confidence • Ethics • Ability to work within the culture (how to be a “professional”) • People skills, empathy • Teamwork and networking • Good communication skills, including second language • Cultural sensitivity • Familiarity with the issues that revolve around disadvantaged and special populations • Problem solving, including flexibility and adaptability • Ability to handle pressure and deal with others under stress • Familiarity with computer technology (spreadsheets, using the Internet, GIS, databases, etc.) • Grant/proposal writing knowledge • Project and budget management experience • Time management and the ability to prioritize • Human resource management 	<ul style="list-style-type: none"> • Analytical skills • Ability to do research, as well as read and understand research • Critical thinking, decision making • Judgment • Ability to network and build coalitions • Negotiation and conflict resolution experience • Ability to work within the political process, legal system, and with different community groups • Leadership • Computer technology (for those who may be coming back to school and have not previously acquired these skills) • Excellent communication capacity • Ability to learn from mistakes (both their own and others)

How might these skills be instilled in students during a degree program?

These skills need to be consistently integrated into multiple classes throughout a program. For example, students should be required to do technical writing and presentations in each course, no matter the knowledge content. In a given program, these skills should be coordinated and reinforced by professors. At the same time, faculty should make sure what they offer matches what is needed in the field and that students will be “hirable.”

In addition to skill-building within the classroom via assignments, two additional mechanisms within a program give students the opportunity to assess and acquire these skills. The case study approach is valuable for assessing the decision-making process in different phases of the emergency/hazards management cycle in an actual setting or event. Internships and/or capstone projects are also excellent for addressing items on the list that are really acquired through experience. In addition, some of the skills may be gained through “training.” For example, incident command is not taught in academic setting, but it is taught in training settings. Continuing Education Units (CEUs) are a valuable way to maintain currency in this rapidly changing field as well as focus on practical, hands-on learning. Multi-disciplinary activities among programs are extremely important.

CORE KNOWLEDGE

What are the key concepts (not skills) that any person should know in emergency/hazards management?

People do not necessarily need to be experts in all relevant disciplines/fields to be effective emergency/hazards managers. They need a firm understanding of emergency/hazards management and all phases of the emergency management cycle, including preparedness, response, recovery, and mitigation. They then need a minimal amount of knowledge from a variety of disciplines in order to foster and sustain communication with experts in these fields. It is simply not possible for an emergency/hazards manager to have enough knowledge on his or her own to address every hazard in a community when taking an all-hazards approach. Further, hazards management requires collaboration for effective response, mitigation, and vulnerability reduction. Thus, the emergency/hazards manager must have enough knowledge to read and understand current research, as well as the ability to establish meaningful dialog with experts in a particular field in order to incorporate that knowledge into mitigation and response plans.

Educating emergency/hazards managers should start broadly, incorporating theoretical views of disasters. Students should become familiar with the various actors involved in emergency/hazards management, as well as all phases of the emergency management cycle. They should gain an overview of the different types of hazards and acquire a basic understanding of risk susceptibility, resilience, resistance, and vulnerability. Importantly, hazards management should be couched in the concept of sustainable development/sustainability and the importance of incorporating mitigation into the urban/rural planning process should be emphasized. Classes/disciplines identified as important include: journalism, policy/political science, geography, urban development and planning, public health, public administration, engineering (for non-engineers), decision-making, economics, information systems, severe weather (current state of the art of forecasting), sociology, statistics, research methods, probability uncertainty theory, ethics, risk analysis, risk modeling, risk management, and communication (social marketing).

How might these knowledge areas be instilled in students during a degree program?

There really are two approaches to educating emergency/hazards managers: 1) material from emergency/hazards management can be incorporated into other fields; or 2) material from other fields can be integrated into a comprehensive emergency/hazards management program. The first approach involves emergency/hazards management curriculum that is infused into other disciplines. The challenge is to identify what key pieces of information should be included for this purpose if it is only a single class, or even a module within a class. No matter the approach, students should always

be exposed to the physical and social sciences and engineering, even if the emphasis is in one of these areas.

While there is a need for general programs that give students a broad education in emergency/hazards management, there can and should be some program specialization, especially for particular geographic areas. This is what would distinguish programs from one another and would allow a focus on niche markets/needs. For example, earthquake hazards are extremely relevant in California and it would be appropriate for programs there to cover this hazard in more depth. Other programs may have opportunities for students to specialize in evacuation and transportation issues, critical infrastructure, social vulnerability, risk communication, or a variety of other focus areas. Importantly, potential jobs exist for students in the private sector, as well as in the public sector and non-profits. Programs should fully explore these opportunities.

BALANCING RESEARCH, THEORY, POLICY, AND PRACTICE

How can hazards research be effectively integrated into a higher education degree program?

Students should be exposed to the fact that theory and research exist. Emergency/hazards management does not occur in a vacuum; it is informed by theory and research from the physical and social sciences. Courses should include texts and journals that incorporate results of research and communicate basic theories. Students should consistently read and dissect current hazards research as a mechanism for understanding theory. Further, this process should involve critically evaluating the work and deciding how to apply it. In this way, emergency/hazards managers can make decisions based on sound physical and social science, rather than on assumptions.

In a university setting, all students, even undergraduates, have opportunities to participate in or to conduct research projects. In this way, research can be used as a method to develop critical thinking skills and to foster an understanding of how theory informs practice in a meaningful way. Appropriately constructed internships can also bring research and practice together. The amount of theory and research included depends on the level of the program. Undergraduate programs, for example, would probably not include as much emphasis on theory as a masters or Ph.D. program and practical experience may also be more limited.

Undergraduates and graduate students alike should understand that research is important for framing and answering questions. However, research must be “translated” into something meaningful for the practitioner. This could, in fact, conceivably be a person who is trained specifically for this task. Some fields explicitly have bridging organizations to make research materials available to practitioners. Another possibility is that researchers (including student research) could distill their work into two pages and make links to practice. Understanding how to translate emergency/hazards management principles for decision-makers is extremely important. These are people who may not even understand the fundamentals of the discipline and yet are responsible for allocating emergency/hazards management funding, implementing policy, or adopting plans.

There is no single overarching disaster theory. Instead, theory from a wide variety of disciplines informs hazards research, depending on the problem and the question. For example, game theory (risk management) and social constructionism (sociology) are both relevant to emergency/hazards management, among many others from other disciplines. In addition to exposure to a theoretical framework, policy review and analysis is absolutely critical and fundamental. This is particularly important for “marketing” emergency/hazards management to decision-makers. Further, understanding the differences and relationships between federal, state, and local governments is essential to formulating effective emergency/hazards planning.

What is the role of training? How can internships be effectively utilized?

Training is really a continuing education or job qualification activity. However, students need to demonstrate competency in this area as well and their curriculum should include practical hands-on

experiences. Thus, the two cannot be divorced entirely. Via training, one learns about specific protocols for given situations. For example, coming to understand research on warning and the role it plays in devising an evacuation plan involves a sophisticated combination of skills acquired from training and understanding current theory and research.

Internships allow the internee to demonstrate competence under supervision. This is a critical experience in many ways. Internships provide a mechanism for demonstrating research and theory in a practical setting in a manner that will stay with students. In order to be effective, however, internships need to be well-structured and have well-defined expectations. Interns should have to produce a write-up, a reflective piece that integrates what they did and learned, and how the experience can be integrated with their education. Professors may also have limited practical experience and so they should also try to spend time in the field. Opportunities should be developed for these experiences.

What is the correct balance of research, theory, policy and practice?

There is no correct balance. At the moment, there is not enough understanding of the marketplace to make a definitive recommendation. In fact, rather than having a single balance, higher education programs in emergency/hazards management should and will be different; diversity is advantageous for the discipline. As emergency/hazards management continues through the professionalization process, the needs and demands in the workplace will shift. Certainly, the requirements for an entry-level position versus a management position are different (as reflected in the skill and knowledge levels section).

RESEARCH AND TECHNOLOGY NEEDS

With what types of technology should students become familiar and to what degree?

Familiarization with computers is absolutely necessary. This includes basic operation and word-processing, as well as being able to run basic database and statistical operations. Communication technology is also extremely important, especially for responding to a hazard event. This includes mechanisms for communication between response teams, as well as for warning systems. A fairly well-developed understanding of information systems is clearly desirable. Anyone involved in emergency/hazards management should have at least a basic understanding of geographic information systems, which are increasingly an essential tool for hazards mitigation and response.

What research in emergency/hazards management is needed to support higher education curriculum development?

As programs in higher education are established and evolve, research is needed to address the pedagogy of hazards management education and assess the effectiveness of these programs. Funding should support course content development and evaluation, delivery mechanisms (such as distance learning technologies), pedagogical approaches (like case study development), utilization of Instructional System Design, and curricula development (including assessing educational organization vulnerabilities and mechanisms for resources/integration within the academic setting). Thus, not only does research support the practitioner, but also the educator. In the table below, these research areas are listed under education, but in fact those within a discipline should also undertake research in hazards management education.

What research is needed to support the continued education and training of practitioners?

Often, in academic settings, a tension exists between theoretical and applied research. This also extends into setting priorities and agendas for emergency/hazards management research in the field. In reality, practitioners need research that is accessible, even if it has a strong theoretical orientation. Practitioners have to develop plans and implement policy as part of their day-to-day activities and

they cannot always be concerned with theoretical advances in the discipline. Thus, applied research probably has more direct relevance within this context. Even applied research, however, can be inaccessible to practitioners if not presented in a meaningful and accessible manner.

The following table highlights needed research topics by discipline. It is not an exhaustive list of disciplines contributing to emergency/hazards management, nor a complete inventory of research to support practitioners. It is rather an overview of potential directions.

Discipline	Research Areas to Support Emergency/Hazards Managers
Anthropology	impacts on cultural heritage and resources; collective memory protection; how culture, race, class, gender, sexual orientation affect the distribution of emergency/hazards management resources and services; disasters and development; emergency response organizations
Atmospheric Sciences	improved forecasting models (short and long term); forecast and warning delivery systems (message structure); uncertainties; climate change and disaster intensity and frequency; mapping; integration of social science research in atmospheric science training
Business	organizational learning; socio-technical systems design and human factors; resource management; incentives for public-private partnerships; insurance; organizational structures; continuity of community systems; public risk model needed; benefits and costs of business mitigation; accountability for response and recovery; market interdependency due to infrastructure (e.g., transportation systems)
Communication	risk communication and warnings (message and receiver characteristics); crisis communications during and after the event; interoperability (administrative, software, and hardware)
Decision-support Systems	Cameo/Aloha, E-Team, FEMA's HAZUS, among others
Economics	subsidization of risk; improved metrics for loss assessment; insurance (issues of rates of adoption); small business impact assessments (economic scale); economic impact of relief and recovery; benefit/cost studies of alternative hazard adjustments; effects of hazard costs on industrial location
Education	assessment of effectiveness of disaster education programs, course content, and pedagogy; utilization of Instructional System Design; educational organization vulnerabilities and resources/integration with their communities; public education and outreach; methods for emergency/hazards managers to educate public officials; K-12 hazards curriculum creation
Engineering	earthquake/wind engineering; hazards and the built environment; sheltering in place; infrastructure vulnerability; evacuation flow analysis; critical infrastructure protection
Environmental Management	human ecology; hazardous materials; ecological processes; hazard mitigation and resource management; long-term sustainability of communities; global climate change effects on pathogens
Geography	hazard zone mapping; vulnerability science; human occupancy of hazards zones; spatial analysis; placed-based analysis; geographic information science applications in hazards; remote sensing technologies
Geology	forecast, warning and communication of geologic hazards; microzonation; geotechnical analysis
Journalism	patterns of reporting on mass casualties in disasters; role of the media in first response; social construction of risk; uses in warning and public information; media organizations and ethics

Law	liability; Freedom of Information; legislative process; victim assistance; hazard notification; quarantine and isolation; property rights and takings; privacy and family reunification; adverse effects of litigation on research; equity in service delivery
Law Enforcement /Criminology	forced evacuations; rules of engagement; evidence/chain of custody; crime scene
Math/Statistics	vulnerability/risk assessment; loss estimation; probabilistic forecasting
Political Science	learning processes and policy evolution; political institutional structures; public policy and science; citizen participation
Psychology	mental health effects of disaster; decision-making processes for risk reduction
Public Administration /Management	organizational learning; emergency/hazards management empowerment; budgeting; fiscal management for major disasters; salience of hazards on the local agenda; public/private partnerships; public participation; coalition building; intergovernmental relations
Public Health	symptom surveillance; public health risk communication; alternate care modalities when hospitals are overwhelmed; effectiveness of traditional containment methods; epidemiology of natural disaster deaths; surge capacity; mental health effects of disaster; emergency/hazards management and public health interface
Sociology	mass communication models of warning; how culture, race, class, gender, sexual orientation affect the distribution of emergency/hazards management resources and services; disasters and development; emergency response organizations; volunteerism; disaster convergence
Urban Planning	hazard mitigation (especially land use planning) and urban design; linking recovery and mitigation; pre-impact recovery planning

UNDERGRADUATE & GRADUATE CURRICULUM

At the post-secondary level, there are many options for creating educational opportunities for emergency/hazards managers, including associate degrees, certificate programs, minor concentrations, bachelors programs, and graduate (masters and Ph.D. equivalent) programs. While undergraduate and graduate programs were considered separately in working groups during the workshop, many of the challenges and opportunities identified were notably similar.

For undergraduate educational opportunities, this section primarily concentrates on options at 4-year institutions, focusing on entire degree programs or minors. In terms of degree programs, an interdisciplinary emergency/hazards management degree may exist. Or, students may obtain a degree in another field with a concentration in emergency/hazards management. Course development can support an entire curriculum in emergency/hazards management, or, alternatively, courses can be utilized to augment an understanding of emergency/hazards management in other disciplines. In fact, modules (1-2 weeks on a specific topic) could be developed for inclusion in courses across disciplines.

At the graduate level, the options are, in fact, quite similar. A program could be designed explicitly for emergency/hazards management where a student obtains a degree in this field. Or, specific disciplines may specialize in emergency/hazards management. For example, a student may obtain a degree in geography or urban planning with an emphasis on emergency/hazards management. In a similar way, courses can be created to support a degree program or to inform other disciplines about the world of emergency/hazards management, using a similar approach to the undergraduate. The primary difference is that degree-based coursework would obviously be more advanced and foster a higher level of critical thinking. Graduate programs would also have to carefully consider the background of incoming students so that program expectations would match

the knowledge level of those admitted. Many students may have little experience with emergency/hazards management, while others may have a great deal.

In all likelihood, the approach selected will depend on a range of circumstances, including existence of faculty (and discipline), financial resources, political climate for creating programs at a particular institution, and anticipated specializations. Importantly, each program should work with state-level agencies and organizations to develop curriculum. The general consensus of the group was that a liberal arts education in combination with a focus or concentration on emergency/hazards management is most valuable because it creates a well-rounded student with a broad background of knowledge useful to emergency/hazards managers. There are many examples of programs representing a variety of approaches catalogued on the FEMA Higher Education Project website (<http://www.training.fema.gov/emiweb/edu/>).

Some of the challenges creating and supporting bachelors and graduate programs include:

1. Lack of funding resources to develop programs
2. Difficulty finding a university grant manager to help faculty acquire funds for research and course development
3. No dedicated staff, teaching assistants and research assistants
4. Lack of administrative vision and support
5. Changing emphasis on homeland security vs. emergency/hazards management
6. Critical mass of students to enter program
7. Securing jobs for students/ Increasing the demand for students with emergency/hazards management degrees (advertising for employment)
8. Diversity issues
9. Lack of faculty from diverse disciplinary backgrounds/ Insufficient faculty with expertise
10. Finding an institutional home for emergency/hazards management programs
11. Universities do not lend themselves to interdisciplinary programs
12. Tenure demands vs. desire to participate in community service
13. Responding to emergency/hazards management fads (focus on different hazards, civil defense, SARs, reactive approaches, proactive approaches, etc.)
14. Legacy of hiring ex-military personnel
15. Low salaries for faculty and students
16. Emerging area of study – marketing to employers and students
17. Meeting the needs of the practitioner community

Strategies for implementation of programs at the bachelors and graduate levels include:

1. Appointing an advisory board to help acquire resources, develop curriculum, and apply political pressure. Members should be from each level of government, the private sector, and the non-profit sector. Others represent should natural or technological hazards.
2. Attracting students from high schools and community colleges
3. Working with the existing state vision
4. Tapping into federal grants and programs
5. Partnering with government agencies, companies and non-profit organizations
6. Taking advantage of real-world events to publicize programs
7. Highlighting the liability of not promoting emergency/hazards management at the university
8. Interactions with state, national and international emergency/hazards management associations
9. Developing release-time protocols for professors who are developing programs (due to the large amount of paperwork required to initiate them)
10. Conducting a needs/capability assessment to illustrate faculty abilities
11. Cultivating a proactive faculty champion
12. Seeking funds for course and curriculum development

POTENTIAL EMERGENCY/HAZARDS MANAGEMENT COURSES

The types of classes that could be included in undergraduate or graduate curricula are wide-ranging because of the truly interdisciplinary nature of hazards research and practice. When considering designing a curriculum at any level, core knowledge areas and core skill areas should be included across all programs. There is a general consensus about the core skills (see previous section) that need to be integrated into the structure. Admittedly, it would be nearly impossible to foster all of the skills in a single person. Even at the undergraduate level, communication skills, writing, and presentation capabilities should cut across all classes.

Except in the broadest sense, there is far less consensus about core knowledge areas. Although several key areas surfaced in the workshop, the specifics of the core of emergency/hazards management still needs further discussion. The core knowledge areas, of course, reflect the level of education. The potential list of classes for undergraduate education is extremely extensive. The importance of incorporating a liberal arts education is apparent. Many of these courses can be taken to meet general university requirements not related to the major.

Potential Undergraduate Courses Relevant to Emergency/Hazards Management	
Air Quality and Air Dispersion	Lifeline Systems
Business Continuity → Private Sector Partnerships	Logistics and Disasters
Civics	Mathematics and Statistics
Comparative Emergency Management	Mega-city Regionalization
Computers	Meteorology
Crisis Communication	Mitigation
Dealing with the Media and Journalism	Needs Assessments
Decision-making under Stress	Non-Profit and Volunteer Management
Disaster Ecology	Organizational Behavior
Disasters and Development	Personal Safety
Economics	Policy Process
Emergency Management in Homeland Security	Politics and Disasters
Engineering and Construction	Public Education
Environmental Science	Public Health (Mental health, emergency response planning, disease surveillance, bio-terrorism, risk communication)
Financial Aspects of Government	Public Safety
Four Phases of Disasters	Public Works and Their Vulnerabilities
General Education Courses	Reconstruction
Chemistry	Risk Estimation and Management
Biology	Social Issues of Disasters
Physics	Social Psychology (Behavior)
Technical Writing	Social Services
Geographic Information Systems	Spanish
Hazard Risk and Vulnerability → with Links to Vulnerability and Sustainability	Special Needs
Hazardous Physical Environment	State and Local Government
Human Behavior in Disasters	Structure of Emergency/Hazards Management in the United States
Human Ecology	Systems Analysis
Human Rights and Humanitarianism	Technical Writing
Interoperability	Theories of Emergency/Hazards Management
Knowledge Management (Information Management and Presentation)	Theory of Planning
Law and Ethics	Transportation
Leadership	Trauma and Disasters
	Warnings and Communication

It would be impossible for a single student to actually take courses in all of these areas. Although still in need of further discussion, the following represents a set of classes that could act as a core for a degree program.

More Specific Set of Undergraduate Courses	
Business	Hazards Survey Course (Physical Aspects)
Capstone Course/Internship/Project	International Disasters
Communication	Introduction to Emergency Management
Economics	Legal Issues
Engineering	Methods
Environment & Health	Organizational Behavior/Leadership
Government Affairs/ Political and Policy	Planning
Dimensions of Disaster and Emergency	Social Dimensions of Disaster
Management	Sustainable Hazards Mitigation
Hazards, Risk, & Vulnerability	Technology

At the graduate level there are even fewer opportunities for additional classes because general education classes do not exist. Instead, graduate programs are generally designed to specialize in a particular area of study within a particular discipline. The following list represents a set of classes that could fashion a general emergency/hazards management program at the graduate level. Again, like the undergraduate list of courses, this is not prescriptive and needs further discussion.

Potential Courses for a Graduate Program	
Built Environment	Research Methods
Capstone/Pro-seminar	Organizational Behavior and Leadership
Communication (Risk)	Planning
Economic Dimensions of Disaster	Public Policy Process and Analysis
Hazards, Risk and Vulnerability	Social Issues (Macro)
Human Behavior in Disaster (Micro)	Structure and Function of Government
Introduction to Emergency Management	

Research methods are imperative for all levels of education and all types of programs. However, as with the development of skill sets and the extent of knowledge, the bachelors degree incorporates less than graduate programs. Undergraduates should know how to find, read, evaluate, and apply research. Graduate students should have a more in-depth understanding of research as well as be able to conduct original studies. In addition to research components, all programs should have a professional development component so that those already in emergency/hazards management can gain from pursuing a career-related degree. In addition, practical experience through internships and case studies are vitally important.

Programs should not be uniform; instead each should provide basic fundamentals and then specialize on specific aspects of disaster management. These lists and suggested courses are only intended to begin further discussion. Certainly, as the professionalization process continues, emergency/hazards management will have different requirements for higher education. The hazards community has the opportunity to define the future direction by tackling these issues now.

CONTINUING EDUCATION UNITS (CEUS)

Currently, CEUs are not used for professional association programs and accreditation in emergency/hazards management. CEUs generally assume prior training or knowledge and are generally a vehicle for continually updating skills and providing additional knowledge. CEUs can have a variety of delivery mechanisms, including the Internet, personal delivery by technical specialists, paper, or CD-ROM. This may occur via university extension systems or through experts in the field.

In the context of emergency/hazards management, CEUs could be used to bring people up to the level of a Certified Emergency Manager (CEM). CEUs are incredibly flexible and can be skill- or knowledge- based. Topics that lend themselves to this type of educational approach include: new technologies, new legislation (statutory and legal developments, case law, statutes), competency modifications, specific local needs, or inter-organizational maintenance, networking, etc.

Since CEUs are not currently used for accreditation or as a requirement for certification, their legitimacy is a major challenge. Some type of organization would need to oversee them for consistency. Since they are not necessarily recognized as a legitimate form of transferring knowledge in emergency/hazards management, cost will likely be an issue for most individuals. Even given the limitations, CEUs should not be excluded as a possibility for additional educational opportunities, particularly in the future as the emergency/hazards management profession becomes more established.

CERTIFICATE PROGRAMS

Undergraduate and graduate certificate programs are a mechanism for universities to formalize a program for those who are not enrolled in an emergency/hazards management program, but have an interest in the field. Certificate programs granted by colleges and universities serve public and private sectors and can also provide a mechanism for continuing education. The private sector spends a lot of money on training and continuing education (for example, risk management), and universities could contribute to meeting this need.

Generally speaking, certificates are comprised of four to six classes. These could include: 1) an overview of disaster research, including findings from disaster research, hazards dynamics, scientific basis of emergency management, fundamentals of emergency management, physical and social vulnerabilities; 2) disaster response planning, including emergency preparedness and disaster response, behavioral foundations of community planning, and the Incident Command Systems (ICS); 3) disaster recovery/mitigation; and 4) hazard analysis and management, including risk analysis/communication/risk management and chronic hazards.

No matter the specific courses, the overall content should incorporate the structures of emergency management at the local, state, and federal levels. In addition, all hazards should be addressed, both natural and human-induced, as well as all phases of the emergency management cycle (preparedness, response, recovery, and mitigation). Research methods should be emphasized, including program evaluation, policy analysis, risk assessment, risk communication, surveillance systems and forensic epidemiology. Conflict resolution and organizational behavior are also important.

The implementation of a certificate program is often much easier than establishing an official degree program at a university. Further, they offer a mechanism for allowing students in other disciplines to specialize in emergency/hazards management and so can serve a purpose different than an actual degree program. For example, a student with a masters degree in urban planning or engineering could take additional courses to obtain a certificate in emergency/hazards management. This could eventually lead to greater awareness across professions. In addition, a certificate program could act as a feeder into a degree program related to emergency/hazards management, or directly into an emergency/hazards management program if one exists.

OVERARCHING CONCLUSIONS

Now, more than ever before, our nation demands a sophisticated discipline of emergency/hazards management. The opportunity to influence the direction of the profession is tremendous. Admittedly, directing a discipline and profession is no small task and presents numerous challenges. Training and degree programs must produce individuals who are marketable and with the needed knowledge and skills to be successful. The following is a summary of the three major conclusions that emerged at the workshop.

CREATING AND NURTURING THE EMERGING DISCIPLINE

Emergency/hazards management means different things to different people. To many, it denotes preparing for and responding to disasters such as those caused by hurricanes, tornadoes, and terrorist attacks. Others see emergency/hazards management as developing land use plans to reduce building in areas subject to flooding. Yet, to others, it refers to constructing buildings that are less likely to suffer damage in, for example, future earthquakes. In today's world, emergency/hazards management is all of these things and more.

Emergency management is different than it was a decade ago, and not yet what it will be in the future. It is more complex and includes many more topics than it did just a few years ago. Emergency/hazards management includes mitigation, preparedness, response and recovery. It demands knowledge and skills in the natural and physical sciences, the social and behavioral sciences, aspects of engineering, and technology. Emergency/hazards management is, without question, interdisciplinary in nature, since it requires drawing on knowledge now housed in various disciplines.

And still, some continue to even debate the question of whether or not emergency/hazards management is a discipline at all. Some consider it to be an activity that lives in the cracks between several "real" disciplines, similar to programs such as environmental or women's studies. Others analogize emergency/hazards management today to the experiences of urban and regional planning over the last several decades. Regardless of one's perspective, those who work in emergency/hazards management today must break down traditional academic and professional boundaries. This is not a simple task when designing curricula or proposing programs. The professionalization of emergency/hazards management will continue to result in training and degree programs with various emphases and specializations. The discipline of emergency/hazards management needs to be created in diverse ways, and then nurtured as it grows and matures in today's world and in the future. More is required than is currently in place.

Today's hazards community must actively create and define the core knowledge areas of emergency/hazards management at the community college, undergraduate, and graduate levels so that students are exposed to fundamentals that define the essence of the discipline. This involves several key elements: 1) creating a consistent terminology, 2) writing and disseminating the full range of courses appropriate to emergency/hazards management, 3) publishing textbooks on emergency/hazards management to define the field, 4) supporting, moving into, and working in departments of emergency/hazards management in our nation's colleges and universities, and 5) developing and funding internship opportunities for students to gain experiences in government agencies and the private sector during their programs of study.

Emergency/hazards management programs should be designed from an all-phase, all-hazards perspective. Emergency managers of the 21st century are required to have a core of knowledge that reaches beyond incident response and also includes the mitigation, preparedness, and recovery phases of emergency/hazards management. Often, the focus in emergency/hazards management has been solely on response capabilities. While important, response without addressing the other phases will not minimize loss. Finding the proper balance is not easy, especially because many emergency/hazards management jobs still focus predominantly on response.

Hazards managers of the future will require an understanding of a wider variety of hazards. Few will have the option of only considering a single hazard, but instead must be more broadly trained to consider the full range of hazards that exist in a given area, including natural, technological, and terrorist hazards. There are several elements of emergency/hazards management that transcend a specific hazard, such as the consideration of ethnic diversity in hazards planning. At the same time, depending on the geographic region, depth of knowledge in one, or a few, hazard areas will often be necessary. In Florida, for example, a thorough understanding of hurricanes is required, while in other states a very different hazard may dominate.

International perspectives must also be incorporated into research and educational opportunities in emergency/hazards management. There is, of course, a need to study international disasters and perspectives, understanding linkages, impacts, and vulnerability. Further, a need exists to critically examine how emergency/hazards management is carried out in other countries to understand whether and how the U.S. model transfers to other locations. Lessons and approaches in other countries could also enhance processes in the U.S.

Emergency/hazards management should be couched within a general sustainability framework and have an explicit focus on vulnerability. This approach will have emergency/hazards managers working within the more general objective of building local communities that are more resilient to natural, technological, and terrorist disasters. If communities are truly sustainable, they are also disaster resistant communities. Along with sustainability, there is clearly a complementary need for further and more complex understandings of vulnerability.

Finally, more needs to be done to create and define the discipline of emergency/hazards management. As the discipline defines itself, as programs succeed and fail, as experiences—both failures and successes—occur, the field must be shaped, re-created, and directed in fruitful directions. This process is natural and dynamic and underlies any discipline. What is needed, today, is for those of us who work in traditional disciplines to own that we are parenting the discipline of emergency/hazards management. As this process unfolds, continued dialog is vital and necessary.

CURRICULA AND COURSE DEVELOPMENT

Workshop participants spent a great amount of time considering and discussing curricula and course needs to support the emerging discipline of emergency/hazards management. There was consensus that a consistent core curriculum for emergency/hazards management is essential, needed, and fundamental to moving the discipline forward. At the same time, it is necessary to have many different kinds of programs, specializing on various aspects of hazards. Guidelines for a core set of knowledge areas should be created now. While several of the workgroups addressed this at various educational levels, the topic is inherently difficult and will require further discussions.

The framework for curricula development that resulted from the workshop is based on the broad view that course and curricula formalization will facilitate program emergence in the institutional structures of colleges and universities and be key in accreditation judgments. Workshop participants called for curricula that provide specialized knowledge, skills, and broad-based overviews; provide linkages to international perspectives; include both education and training; cover the full range of topics that are included in emergency/hazards management; and equip students with both critical and adaptive thinking capacity. Emergency/hazards management programs will certainly have specialties as they develop and evolve, which is necessary in order to prepare students for diverse careers in public, private, and non-profit organizations.

A few good basic textbooks on emergency/hazards management are an essential step to both defining the discipline and to paving the way for common curricula elements across colleges and universities. Course development and dissemination, like that resulting from FEMA's Higher Education Project at EMI, is widely acclaimed and encouraged to move forward. These courses contribute immeasurably to the dissemination of the substance of emergency/hazards management

across the nation into diverse teaching settings ranging from continuing education to Ph.D. programs.

PROMOTING AND SUPPORTING THE PROFESSION AND PROFESSIONALIZATION

A few short decades ago, the men and women who worked and accomplished a great deal in the field of emergency management often did not hold university degrees. If they did, it was usually in a topic unrelated to their endeavors, let alone in emergency/hazards management itself. Today, the world is different and the requirements of the emergency/hazards manager have expanded. The profession must be promoted and supported beyond previous efforts. The third clear and reoccurring conclusion from the workshop is a call for more active promotion of the profession of emergency/hazards management and support for its increased professionalization.

There is a need to support the people who currently work in the field of emergency/hazards management. The educational gap for working professionals could be filled with educational opportunities tailored to meet their needs in their local communities or through distance learning. Some ideas presented at the workshop include night classes at local community colleges, correspondence courses, and continuing education classes in colleges and universities. The on-going accomplishments of FEMA's Emergency Management Institute (EMI) were acknowledged, but EMI is not a substitute for courses provided through universities.

Those in academic settings who currently work in our nation's colleges and universities need to pay particular attention to mentoring new, young faculty to populate the emergency/hazards management programs that are being created or are growing throughout the nation. Too often, new faculty are groomed for jobs in the disciplines in which they obtained their degrees. What is now needed is for some to go work in emergency/hazards management departments—at least until such time that emergency/hazards management departments begin hiring their own graduates. Our nation has only very recently seen the first Ph.D.-granting department in emergency/hazards management. This program cannot produce the number of faculty needed. This interim gap must be filled with faculty from other disciplines.

In conjunction with creating academic programs, supporting current emergency/hazards managers, and establishing mechanisms for expanding the number of faculty, the job market must also be addressed. Although many jobs exist in emergency/hazards management in our nation today, many of them have a lower status than other public service positions, and are often poorly paid. There is also a need to consider both private and public sector employment opportunities. The people who currently work in emergency/hazards management leadership positions in major federal, state, and local agencies should step forward to enhance the prestige and salaries of emergency management professionals. In this way, those selecting an emergency/hazards management degree program will have the promise of well-paid professional positions. This is additionally important since the population of people currently working in emergency/hazards management is aging, and there will soon be a large turnover of emergency/hazards management professionals across the nation.

Participants applauded the existing programs in the nation that cultivate interest in and support emergency/hazards management. Some examples of these programs include the FEMA/American Planning Association (APA)-sponsored program to fund emergency/hazards management internships in planning departments, the "Enabling Project" supported by the National Science Foundation, and a new partnership between the NSF, the Public Entity Risk Institute and the University of Colorado to award fellowships for dissertation research in emergency/hazards management. More programs like these are needed, and the ones in place should be continued to foster the development of the profession. Additional funding is needed for developing curriculum at all levels, conducting program assessments, creating opportunities for linking research and education, and fostering research related to the professionalization of emergency/hazards management. The academic and practitioner

communities must work together diligently, forming closer ties through professional organizations and applied research opportunities, to further the field of emergency/hazards management.

While not the explicit focus of this workshop, Homeland Security also links directly with emergency/hazards management in both professional and academic settings. The current direction in the U.S. requires that emergency/hazards management extend beyond traditional boundaries, while at the same time continuing to focus on hazards loss reduction. The hazards community must promote itself within this context, forming linkages in educational programs as well as professionally.

APPENDIX A

HAZARDS MANAGEMENT WORKSHOP AGENDA

WEDNESDAY, OCTOBER 22

- 8:30 Registration and Coffee (*Larimer/Champa Combination Room*)
9:00 Welcome (*Larimer/Champa Combination Room*)
Deborah Thomas, University of Colorado at Denver
9:05 Opening Remarks
Dennis Mileti, Natural Hazards Center
9:15 Introduction of Workshop Participants
10:00 BREAK
10:20 FEMA's Higher Education Project
Wayne Blanchard, Federal Emergency Management Agency
11:00 Academic Perspectives
Brenda Phillips, Jacksonville State University
12:00 LUNCH (*served on Club Bar in common area*)
1:00 Practitioner Perspectives
J.R. Thomas, Franklin County Emergency Management Agency
President, International Association of Emergency Mangers
1:30 Research Needs to Support Practice
Michael Lindell, Texas A&M University
2:30 BREAK
2:50 Working Group Sessions

Core Knowledge Areas (*Larimer Room*)
Discussion Leader: Clancy Philipsborn

Core Skill Set (*Champa Room*)
Discussion Leader: Sally Ziolkowski

4:30 Adjourn for the Day

THURSDAY, OCTOBER 23

- 9:00 Reports from Working Groups & Discussion (*Combination Room*)
10:30 BREAK
10:50 Working Group Sessions

Research and Technology Needs (*Larimer Room*)
Discussion Leader: Jerry Mitchell

Balancing Research, Theory, Policy and Practice (*Champa Room*)
Discussion Leader: Gerald Hoetmer

12:00 LUNCH
1:00 Reports from Working Groups & Discussion (*Combination Room*)
2:30 BREAK

2:50 Working Group Sessions

Certificate Programs (*Larimer Room*)
Discussion Leader: Paula Gori

Undergraduate Program; Linkages with Community Colleges (*Champa Room*)
Discussion Leader: L. Thomas Tobin

Graduate Program (*Larimer Room*)
Discussion Leader: Ross Corotis

4:30 Adjourn for the Day

FRIDAY OCTOBER 24

8:30 Reports from Working Groups & Discussion (*Combination Room*)

10:30 BREAK

10:50 Wrap-up and Future Directions

12:00 Adjourn

APPENDIX B

HAZARDS MANAGEMENT PARTICIPANT LIST

Ernest Abbot

FEMA Law Associates, PLLC
Washington, DC

Don Beckering

State Director, Fire/EMS/Safety Training
Hennepin Technical College Campus
Minnesota State Colleges and Universities
St. Paul, Minnesota

Lianne Bellisario

Office of Critical Infrastructure
Protection & Emergency Preparedness
Ottawa, Canada

Stephen Bender

Organization of American States
Washington, DC

Richard Bissell

Department of Emergency Health Services
University of Maryland-Baltimore County
Baltimore, MD

B. Wayne Blanchard

Higher Education Project Manager
Emergency Management Institute
National Emergency Training Center
Federal Emergency Management Agency
Department of Homeland Security
Emmitsburg, MD

Neil R. Britton

Earthquake Disaster Mitigation Research
Centre
National Research Institute for Earth Sciences
and Disaster Reduction
Kobe, Japan

George Busenberg

Graduate School of Public Affairs
University of Colorado at Denver
Denver, CO

Peter Callinicos

Red Rocks Community College
Division of Fire Science
Lakewood, CO

Steven Charvat

Emergency Management Coordinator
University of Washington
Seattle, Washington

Nien Yin (NY) Chang

Department of Civil Engineering
University of Colorado at Denver
Denver, CO

Ross B. Corotis

Department of Civil Engineering
University of Colorado
Boulder, CO

Leanna Falkiner

Institute for Catastrophic Loss Reduction
Toronto, Canada

Henry (Hank) W. Fischer III

Department of Sociology
Millersville University
Millersville, PA

Joseph H. Golden

NOAA/Forecast Systems Laboratory
Boulder, CO

Paula L. Gori

U.S. Geological Survey
Reston, VA

George Haddow

Bullock and Haddow LLC
Reston, VA

Richard Hansen

Masters of Integrated Science Program
University of Colorado at Denver
Denver, CO

Robert Hariss

Environmental and Societal Impacts Group
National Center for Atmospheric Research
Boulder, CO

Edward J. Hecker

Civil Emergency Management Branch
U.S. Army Corps of Engineers
Washington, DC

Megs Hepler

Federal Emergency Management Agency
Department of Homeland Security
Washington, DC

Gerard Hoetmer

Public Entity Risk Institute
Fairfax, VA

Brian Hyde

Senior Water Resources Specialist
Colorado Water Conservation Board
Denver, CO

Vickie Johnson

The Cooperative Program for Operational
Meteorology Education, and Training
(COMET)
University Corporation for Atmospheric
Research
Boulder, CO

Michael K. Lindell

Texas A&M University
College Station, TX

Scott Logan

Federal Emergency Management Agency -
Region VIII
Denver, CO

Michael Marlow

School of Education
University of Colorado at Denver
Denver, CO

David McEntire

Program Coordinator
University of North Texas
Denton, TX

Dennis Mileti

Natural Hazards Center
University of Colorado
Boulder, CO

Jerry T. Mitchell

Department of Geography and Geosciences
Bloomsburg University
Bloomsburg, PA

David M. Neal

Institute for Emergency Preparedness
Jacksonville State University
Jacksonville, AL

Philip N. Omi

Forest Fire Science
Department of Forest, Rangeland, and
Watershed Stewardship
College of Natural Resources
Colorado State University
Ft. Collins, CO

Laurie Pearce

British Columbia, Canada

Clancy Philipsborn

Hazard Mitigation & Emergency Management
Programs
AMEC Earth and Environmental
Lakewood, CO

Brenda A. Phillips

Institute for Emergency Preparedness
Jacksonville State University
Jacksonville, AL

John C. Pine

Department of Environmental Studies
Louisiana State University
Director - Disaster Science and Management
Program
Baton Rouge, LA

James V. Porto

Director, Executive Master's Programs
Health Policy and Administration
School of Public Health
UNC-Chapel Hill
Chapel Hill, NC

Richard Roth, Jr.
Huntington Beach, CA

Jim Russell
Vice President, Outreach
Institute for Business and Home Safety
Tampa, FL

Robert Schneider
Chair, Department of Political Science
University of North Carolina at Pembroke
Pembroke, NC

James C. Schwab
American Planning Association
Chicago, IL

Gregory L. Shaw
Program Director, Institute for Crisis,
Disaster and Risk Management
George Washington University
Washington, DC

Gavin Smith
Program Manager
PBS & J
Raleigh, NC

Stefanie Schneider
Masters of Social Science Program
University of Colorado at Denver
Denver, CO

Kelly C. Sparks
Southern Colorado Geodata Lab
Department of Geography and
Environmental Studies
University of Colorado at Colorado Springs
Colorado Springs, CO

Ellis M. Stanley, Sr.
City of Los Angeles, Office of Emergency
Management
Los Angeles, CA

Deborah Thomas
Department of Geography
University of Colorado at Denver
Denver, CO

John (J.R.) Thomas
Emergency Management Director
Franklin County Emergency Management
Columbus, OH

L. Thomas Tobin
Tobin & Associates
Mill Valley, CA

Susan K. Tubbesing
Earthquake Engineering Research Institute
Oakland, CA

William L. Waugh, Jr.
Department of Public Administration and
Urban Studies
Georgia State University
Atlanta, GA

Dennis Wenger
National Science Foundation
Division of Civil and Mechanical Systems
Washington, DC

Frank Wentworth
Department of Geography
University of Colorado at Denver
Denver, CO

Colin Whitenack
Graduate School of Public Affairs
University of Colorado at Denver
Denver, CO

Jennifer Wilson
Emergency Management Program
North Dakota State University
Fargo, ND

Frances E. Winslow
Director, Office of Emergency Services
City of San Jose
San Jose, CA

Sally Ziolkowski
Federal Emergency Management Agency -
Region IX
Oakland, CA

APPENDIX C

PRE-WORKSHOP DOCUMENT

COMPLETED PRIOR TO ATTENDING WORKSHOP

Thank you for agreeing to participate in this workshop in October. We look forward to seeing you in Denver and to a productive workshop!

The letter of invitation indicated that we are requesting a short, 2-3 page document prior to the workshop. Because of the amount of work we must accomplish at the workshop, we would like people to briefly present their perspectives about higher curriculum for hazards/emergency management. We are not asking for a formal paper, but rather that you answer the following questions in bulleted or paragraph form to convey some of your thoughts. These will then be compiled for distribution at the meeting and will provide discussion points and the foundation for the workshop outcomes document.

Please submit by October 5 via e-mail to Deborah Thomas (deborah.thomas@cudenver.edu).

Information about you:

Name

Position

Affiliation

Educational Background

Briefly describe how you ended up in hazards research or emergency/hazards management.

Question 1:

When considering an interdisciplinary hazard/emergency management degree, indicate which disciplines should be represented in the **UNDERGRADUATE** degree program (4-year program; approximately 36 semester hours/12 classes). Place a “C” next to those that should be part of a core requirement and an “E” next to those that should be an elective, potentially part of a specialty option. Further, if you think that a student should take more than 1 class from a certain discipline, indicate how many classes and whether they are core requirements or electives. Also, to the right, type what these classes might be called.

For example, if you think that geography should be included in the core and as an elective, type: “1C, 1E geography; Hazards Geography, Geographic Information Systems.” For the moment, do not be concerned with the class content.

Anthropology
Atmospheric Sciences
Business Administration
Communication
Economics
Education
Emergency Management
Engineering
Environmental Management
Geography
Geology
Journalism
Law
Law Enforcement
Mathematics/Statistics
Political Science
Public Administration
Public Health & Emergency Medicine
Public Policy
Risk Management
Sociology
Urban Planning
Other

Question 2:

When considering an interdisciplinary hazard/emergency management degree, indicate which disciplines should be represented in the **GRADUATE** degree program (masters level, approximately 30 hours of coursework). Place a “C” next to those that should be part of a core requirement and an “E” next to those that should be an elective, potentially part of a specialty option. Further, if you think that a student should take more than 1 class from a certain discipline, indicate how many classes and whether they are core requirements or electives. Also, to the right, type what these classes might be called.

For example, if you think that geography should be included in the core and as an elective, type: “1C, 1E geography; Hazards Geography, Geographic Information Systems.” For the moment, do not be concerned with the class content.

Anthropology
Atmospheric Sciences
Business Administration
Communication
Economics
Education
Engineering
Environmental Management
Geography
Geology
Journalism
Law
Law Enforcement
Mathematics/Statistics
Political Science
Public Administration
Public Health & Emergency Medicine
Public Policy
Risk Management
Sociology
Urban Planning
Other

For questions three and four, we would like you to consider the skills and core knowledge that all emergency/hazards managers should ideally gain from a higher education degree. In other words, after obtaining a degree what should every emergency/hazard manager know about emergency/hazards management and what abilities should each possess, recognizing that knowledge and skills are not one and the same? Please address these separately in the following questions:

Question 3:

What skills should an emergency/hazards manager possess? How should these be instilled? Differentiate between undergraduate and graduate levels.

Question 4:

List essential knowledge areas for anyone in hazards management (key theories, paradigms, and models). In other words, what are the key concepts (not skills) that any person should know whether s/he pursues a hazards/emergency management degree or a degree in a related discipline, or focusing on a specific hazard. Differentiate between undergraduate and graduate levels.

Question 5:

What class(es) from your discipline (or based on your professional experience) should be included in an interdisciplinary hazard management degree program? For each one listed, please also list five core knowledge areas that should be gained from that class.

Question 6:

With what types of methodological, analytical, and/or evaluation techniques should be included in a degree program?

Question 7:

What is the appropriate balance between research, theory, policy and practice? What is the role, if any, of training in an undergraduate or graduate degree program.

Question 8:

If one were to consider creating a hazards/emergency management certificate consisting of approximately 5 classes, which ones would these be?

APPENDIX D

WORKING GROUP GUIDELINES

OVERALL DIRECTION

Each working group will have:

- A discussion leader
- A recorder to document the group's process
- A rapporteur to present the group's ideas and recommendations to general sessions

The working group recorder and rapporteur will be selected by the working group participants. Working group recorders are responsible for tracking and documenting discussions using either a computer, overheads, or some other method that will make the information easy to incorporate into a final report. Working group rapporteurs will present a summary of the working group's discussion during the reporting sessions when the entire group comes back together following the working sessions. All working group reports and notes will be collected for preparation of the products developed from the workshop.

WORKING GROUP SESSION: CORE SKILL SET

OVERVIEW: We would like you to consider key skills that all emergency/hazards managers should ideally gain while earning a higher education degree. In other words, after obtaining a degree what abilities should every emergency/hazard manager have in order to perform the job effectively?

DISCUSSION LEADER: Sally Ziolkowski

QUESTIONS: Please address the following questions regarding the key skills (not concepts) that any person should possess in emergency/hazards management. This list is only a beginning and the dialog will likely generate additional questions.

- 1) What types of skills should students gain during a higher education program?
 - a. Undergraduate
 - b. Graduate
- 2) How do these skills enable an emergency/hazard manager to do the job more effectively?
- 3) How might these skills be instilled in students during a degree program?
 - a. Is there specific coursework that would achieve some of these skills?
 - b. If not specific coursework, what other mechanisms could be utilized to foster these abilities?

WORKING GROUP SESSION: CORE KNOWLEDGE AREAS

OVERVIEW: We would like you to consider the core knowledge that all emergency/hazards managers should ideally gain from a higher education degree. In other words, after obtaining a degree what should every emergency/hazard manager know about emergency/hazards management. This differs from abilities and skills.

DISCUSSION LEADER: Clancy Philipsborn

QUESTIONS: Please address the following questions regarding the key concepts (not skills) that any person should know in emergency/hazards management. This list is only a beginning and the dialog will likely generate additional questions.

- 1) List key theories, paradigms, and models with which every emergency manager should be familiar.
 - a. Undergraduate Level
 - b. Graduate Level
- 2) What methods should be included in a hazards management curriculum?
 - a. Undergraduate Level
 - b. Graduate Level
- 3) What set of classes should comprise the core in an emergency/hazards management degree and what core knowledge areas would each address?
 - a. Undergraduate Level
 - b. Graduate Level
- 4) How should theory inform practice?

WORKING GROUP SESSION: RESEARCH AND TECHNOLOGY NEEDS

OVERVIEW: We would like you to consider key skills that all emergency/hazards managers should ideally gain while earning a higher education degree. In other words, after obtaining a degree what abilities should every emergency/hazard manager have in order to perform the job effectively?

DISCUSSION LEADER: Jerry Mitchell

QUESTIONS: Please address the following questions regarding research and technology needs to support higher education curriculum. This list is only a beginning and the dialog will likely generate additional questions.

- 1) With what types of technology should students become familiar and to what degree?
 - a. Are there areas of technology education or integration that should be available to people already in the field?
 - b. What delivery mechanism might be used, especially for remote access?
 - c. How might these be incorporated into content classes?
- 2) What research is needed to support the continued education and training of practitioners?
- 3) What research in emergency/hazards management is needed to support higher education curriculum?

WORKING GROUP SESSION: BALANCING RESEARCH, THEORY, POLICY AND PRACTICE

OVERVIEW: Research, theory, policy and practice all play an important role in emergency/hazards management. The challenge is creating the right balance for students so that they gain a full appreciation for emergency/hazards management and become marketable for jobs.

DISCUSSION LEADER: Gerald Hoetmer

QUESTIONS: Please address the following questions regarding the integration of research, theory policy, and practice in emergency/hazards management. This list is only a beginning and the dialog will likely generate additional questions.

- 1) How can hazards research be effectively integrated into a higher education degree program? To what research should students be exposed?
- 2) Which theories are most relevant to emergency/hazards management?
- 3) To what extent should policy review and analysis be included in a program?

- 4) What is the role of training in a higher education curriculum?
- 5) How can internships be effectively utilized to integrate these?
- 6) What is the correct balance of research, theory, policy and practice?

**WORKING GROUP SESSION: UNDERGRADUATE, GRADUATE, CERTIFICATE AND
CONTINUING EDUCATION**

The working groups for curriculum development at various levels were asked to consider the following issues:

1. Potential models for implementation
2. 2 or 3-prong approach, program, classes, module dev 1-2 wks
3. Challenges and issues
4. Strategies for implementation

UNDERGRADUATE DISCUSSION LEADER: L. Thomas Tobin

GRADUATE DISCUSSION LEADER: Ross Corotis

CERTIFICATE DISCUSSION LEADER: Paula Gori

CONTINUING EDUCATION DISCUSSION LEADER: Neil Britton

APPENDIX E

ACKNOWLEDGEMENTS

During the 2-1/2 days in Denver, workshop participants worked tirelessly to tackle issues of higher education needs for emergency/hazards management. Their dedication to the hazards community is impressive and this document is the result of their efforts. The report captures the key elements of the workshop, incorporating the views of many, rather than one. When asked for feedback on the workshop document, several participants again took time out of their busy schedules to provide review. Workshop organization would not have been possible without the assistance of Frank Wentworth, a geography major at the University of Colorado at Denver. Also, Wendy Steinhacker, Kathleen Tierney, and Greg Guibert at the Natural Hazards Center at Boulder were kind enough to review the document and provide input.