



## **Program Agenda:**

### **March 17, 2003**

8:30-8:45 am	Introductions
8:45-9:30 am	Welcoming Remarks
9:30-11:00 am	Risk Reduction in Mexico City, D.F.
11:15-12:45 pm	Risk Reduction in Bogota, Colombia
12:45-1:45 pm	Luncheon
1:45-3:15 pm	Risk Reduction in Quito, Ecuador
3:30-5:00 pm	Discussion of Models: Requirements, Risks, Benefits

### **March 18, 2003**

7:00-8:30 am	Risk Reduction in Kobe, Japan
8:30-9:00 am	Risk Reduction in Mumbai, India
9:00-10:45 am	Risk Reduction in Pittsburgh, PA
11:00-12:30 am	Risk Reduction in Los Angeles, CA
12:30-1:30 pm	Luncheon
1:30-3:00 pm	Discussion: Risks, Requirements, Benefits
3:15-4:45 pm	Integrating Models of Hazard Reduction and Response
4:45-5:15 pm	Summary and Recommendations

## **Introducing the Workshop Sponsors:**

Global Academic Partners Program, University Center for International Studies  
 High Performance Computing and Communications Program  
 Graduate School of Public and International Affairs  
 School of Information Sciences  
 University Center for Social and Urban Research  
 Department of Civil Engineering  
 Center for Latin American Studies  
 Center for Asian Studies at the University of Pittsburgh  
 and  
 The Japan Iron and Steel Foundation  
 Earthquakes and Megacities Initiative

## **PARTICIPATING UNIVERSITIES AND METROPOLITAN REGIONS:**

**Universidad de los Andes, Bogota, Colombia**  
**Escuela Politecnica Nacional, Quito, Ecuador**  
**Universidad Nacional Autonoma de Mexico**  
**El Colegio de Mexico, Mexico City, DF**  
**Kobe University, Kobe, Japan**  
**University of California, Los Angeles, Los Angeles, California**  
**University of Pittsburgh, Pittsburgh, Pennsylvania**

**Please visit the Workshop Web Site at:**  
[www.iisis.pitt.edu/html/Workshopagenda.doc](http://www.iisis.pitt.edu/html/Workshopagenda.doc)

## **HAZARD REDUCTION AND RESPONSE IN METROPOLITAN REGIONS: AN INTERDISCIPLINARY MODEL**



Photo: Ahmedabad, Gujarat State, India, January 2001.

## **Workshop and Interactive Videoconference among Metropolitan Regions**

March 17-18, 2003

*Mervis Hall, Room B75  
 University of Pittsburgh  
 Pittsburgh, PA 15260*

## ***Program Goal***

The goal of this program is to develop a metropolitan model of risk assessment, reduction and response that could be used by practicing managers to assess risk, adapt existing performance to reduce the vulnerability of their cities to natural and technical hazards, and respond effectively when hazards occur. The program will be both international and interdisciplinary, drawing upon the disciplines of earth science, engineering, computer science, information science, public health, urban planning and public policy that are represented in the backgrounds of the collaborating researchers. We will focus the program at the city level, which has the immediate burden of first response to disaster, but where resources and training are often most limited.

## ***Workshop Objectives***

To present models of research and instruction for risk assessment, reduction and response in metropolitan regions that could be used by practicing managers to reduce the vulnerability of their cities to natural, technical, and deliberate hazards, and to support response operations when threats occur.

To engage in dialogue directly with municipal administrators in each participating city to invite their participation and feedback in devising methods of risk reduction and management, based on scientific evidence and analysis and supported by high performance computing facilities.

To demonstrate the potential uses of innovative technical means to support organizational policies and practice for hazard reduction and response in complex metropolitan regions.

To propose an interdisciplinary program of research, education, and practice that would implement recommended methods and models of risk assessment, reduction and response in metropolitan regions in collaboration with researchers at Universidad de Los Andes, Bogota, Colombia; Escuela Politecnica Nacional, Quito, Ecuador; Colegio de Mexico and Universidad Nacional Autonoma de Mexico, Mexico City, D.F., University of California, Los Angeles and University of Southern California, Los Angeles, CA; Kobe University, Kobe, Japan, and the University of Pittsburgh, Pittsburgh, PA.

## ***Interdisciplinary Design and Implementation***

This project is one of the initial projects in the Global Academic Partners Program (GAP) developed by the University Center for International Studies (UCIS). GAP represents a major effort to support emerging research and educational issues in the University's newly established Global Studies Program. The project is interdisciplinary, and is supported by seven schools, departments and research centers within the University. The

project is being conducted in collaboration with the Earthquakes in Megacities Initiative (EMI), which is contributing time and travel expenses of experienced hazards researchers to support the planning activities and research conference.

The High Performance Computing Center and Center for Instructional Development and Distance Education have provided the technical support for an Internet2 videoconference of the workshop proceedings that enable a wider group of faculty and students at five universities and policy makers in the respective cities, including Pittsburgh, to participate interactively in the review of the research and instructional models developed by the international research team. The use of Internet2 facilities to support interactive transmission of findings significantly multiplies the value of this interdisciplinary hazards reduction and response workshop by reaching faculty and student audiences simultaneously at research institutions in five nations, as well as policy makers in the respective cities.

This research and educational program also builds upon work already begun under the Earthquakes in Megacities Initiative (EMI) over the past seven years, but extends it to an all-hazards approach.

## ***Need for Hazard Reduction***

Recurring hazards pose a continuing threat to megacities in the developed and developing worlds. (Megacities are those cities with populations over 1,000,000 residents.) This problem is especially severe in Pacific Rim nations, where major cities located on the Ring of Fire are vulnerable not only to earthquakes, but also to cyclones, fires, floods, terrorist attacks and other hazards. For example, when a major disaster occurs in a metropolitan region, scarce resources are used to meet the urgent needs of the affected population, leaving little to invest in the mitigation of future hazards that will surely recur. In such events, international assistance becomes a major part of the response effort, but often the assistance is ill-timed, poorly designed, and ultimately ineffective in reducing the vulnerability of the affected region. The result is a deepening vulnerability to hazards -- natural, economic, social and political -- that reduces the capacity of the affected region to manage its exposure to risk and threatens its potential for achieving a sustainable level of development.

The need for improved hazard reduction and response is especially acute in megacities, where demographic shifts show that populations are moving increasingly into zones that are vulnerable to hazards. In Latin America, it is estimated that 85% of the population now live in cities, increasing the number of people who are exposed to risk and concentrating the likely consequences of a disaster in the region. In Asia, the same phenomenon is occurring. More serious, the occurrence of disasters, and their associated losses appears to be increasing. In their annual report on natural catastrophes, the Munich Reinsurance Group (2000) reported that 755 major disasters occurred in 1999, compared to the thirty-year average of 600 disasters per year. The losses associated with this high number of disasters was estimated at over \$100 billion

globally, with three of the most severe disasters occurring in Latin America and 60% of all disasters occurring in Asia.

Sustainable development requires a continual process of anticipating likely risks, and adapting resources and skills to reduce and respond to them. This is a dynamic process that involves systematic assessment and monitoring of risk-prone areas, as well as flexible adaptation to environmental change by both technical and organizational structures. Traditional organizations and structures assume stable environments, and therefore are vulnerable to the sudden, destructive impact of hazards. It is imperative to develop new models of risk reduction and response that assess more accurately the dynamic characteristics of the changing earth and its social and economic systems in order to reduce the losses from recurring hazards.

## ***A Sociotechnical Approach***

Hazard reduction and response represent major problems for inter-organizational communication and coordination among public, private, and nonprofit organizations. Previous research has documented the recurring failure in coordination among organizations engaged in rapidly evolving response systems following earthquakes. Advanced information technology now offers the potential for increasing communication and coordination among many organizations engaged in actions to achieve a common goal, reduction of risk to their communities. Projects developed under this program would enable metropolitan regions to reduce the risk from, and respond to, extreme events in their respective communities.

This approach assumes that coordination depends upon the rapid exchange and comprehension of information among human managers in multiple organizations and jurisdictions operating under dynamic conditions. Information becomes the critical factor for introducing change in organizational performance, with its lack resulting in failure in coordination and its timely communication contributing to informed adaptation among organizations under threat.

The design, delivery, and measurement of effective information processes on a community-wide scale are not trivial. The difficulty increases under the urgency and complexity imposed by extreme contexts. While recent research on computer-aided decision making has focused on increasing the capacity of individuals or small groups to make more informed decisions, there has been no previous exploration of the extent to which computer-aided decision support can increase the capacity for coordinated action among sets of organizations working at different levels of responsibility in multiple jurisdictions to achieve a common goal. This project will investigate the extent to which advanced means of information search, exchange, computation and graphic display of information can facilitate the rapid exchange of information among multiple sources and organizations, and increase the comprehension of complex events by practicing managers operating at different locations and with different levels of responsibility, experience and skill.