

# Understanding Government Contexts in GeoCollaborative Crisis Management

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## ABSTRACT

This panel presentation serves as a forum for sharing perspectives, methodologies, experiences, and lessons on how geocollaborative crisis management (GCCM) is facilitated and supported by advanced information technologies in a variety of government contexts. The goal is to generate intellectual synergy towards understanding the scientific and practical issues for effective facilitation of GCCM.

## Categories and Subject Descriptors

H.4.m [Information Systems Applications]: Miscellaneous

## General Terms

Management, Measurement, Design, Human Factors

## Keywords

Digital government, crisis management, geocollaboration

## 1. PANEL SUMMARY

Extreme crisis events, such as hurricanes, disease outbreaks, and terrorist attacks, are happening in higher frequency and magnitude. These factors impose unprecedented challenges to the central mission of government agencies tasked with protecting national security, sustained social-economic development, and offering relief assistance. To be effective in managing crises, governments and local communities across local, national, and international scales must work together to collect, share and integrate geographic information, in part, for monitoring crisis situations, and for spatial decision support, such as determining resource allocations. It is these types of multi-scale, multi-organization, and collaborative efforts directed to achieve common goals through geospatial technologies in crisis management activities we label as geocollaborative crisis management (GCCM).

Facilitating effective GCCM is extremely challenging for two reasons. First, the process involves large numbers of geographically distributed government agencies and individuals. The differing social, technological and cultural backgrounds of these groups affect their capabilities for information collection and sharing, and making spatially-based decisions. Furthermore, it is often unclear in GCCM activities (a) what geographic information is available to the group and from whom, (b) who is responsible for what aspects of a disaster, and (c) what the overall common operating picture is. Second, due to the sporadic nature of crises and the lack of sufficient information for making

informed decisions and taking actions, government agencies and individuals and the public often operate under conditions of extreme uncertainty. Although incremental advances can be made within one's immediate government context (such as EPA in the US), we believe that radical solutions to the problems outlined are needed. In particular, solutions will require a transdisciplinary approach across multiple government contexts to more fully explore issue complexities and the possible design alternatives for better enabling crisis management process across government contexts.

The challenges identified above have attracted many research efforts for the development of advanced information technology support and scientific understanding of the processes of group work through geospatial information technologies in coordinated crisis management. In particular, the United States National Science Foundation (US-NSF) has funded eleven GCCM-related research efforts through its Digital Government Research program. Recently, the US and Chinese National Science Foundations have established joint funding for programs that foster collaborative research on digital government issues across these two government contexts, within which GCCM was identified as a critical research theme. Both of these programs have started to generate collaboration among academic researchers and crisis management practitioners. However, it is clear that existing results are largely fragmented and disconnected. Thus, a need exists to combine and synthesize these results.

The primary goal of the panel is to share perspectives, methodologies, experiences, and lessons on how geocollaborative crisis management is facilitated and supported in a variety of government contexts. The panel is expected to achieve intellectual synergy towards understanding the scientific and practical issues that enable and/or hamper facilitation of GCCM.

## 2. THEMES AND ISSUES

Addressing the challenges of understanding and supporting geocollaborative crisis management in government contexts demands a transdisciplinary approach that can greatly benefit from international perspectives. This panel brings together top scholars from academia and experienced crisis management practitioners, each with active research programs or professional involvement in crisis management, emergency response, and related technological developments. The panel builds intellectual synergy by integrating perspectives from management science, information science, geography/GIS, human-computer interaction, computer supported cooperative work (CSCW),

distributed systems, and cognitive systems engineering for better understanding of geocollaborative crisis management issues. In particular, panelists will perspectives, research results, and visions on the following important GCCM related issues:

- (1) *Given two counties with distinct political and social structures, what are the operational similarities and differences in GCCM?* In particular, the panel will contrast US perspectives with those from other countries (such as China). The United States and other countries have taken quite different paths in organizing and supporting crisis management activities due to differences in their social/cultural environment, political systems, geography and technological advances. By sharing the lessons and experiences from previous large-scale crises, scientists from the US may gain knowledge about alternative ways of optimizing crisis management processes in other societal structures, and vice versa. Some of these design alternatives (both in structure of coordination and technology support) may be natural in one country but turn out to be 'not viable' in another country. Exchanging such knowledge is critical so mistakes are not repeated or inappropriate or irrelevant methods used.
- (2) *Why do current information technologies fail to support effective GCCM?* Complementary GCCM efforts exist in the US and other countries that can be drawn upon and shared for addressing this question. On the US side, the problem of group work with geospatial information has been framed and analyzed from the perspectives of geography, information science, and cognitive science. The focus has been on how advanced collaborative technologies can be designed to work with complex geographical information in crisis management. In contrast, other countries have put a stronger emphasis on a management science perspective (inter-agency coordination, synchronization of response, models of group decision, and risk assessment) as well as on the construction of geospatial data infrastructure and services. The panel will facilitate the synthesis of these complementary efforts to enrich methodologies of GCCM research.
- (3) *How can geospatial systems and/or information environments be developed and integrated to support crisis management across all phases of the disaster cycle?*

### 3. PANEL INFORMATION

#### 3.1 Panel Moderators:

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