Working Groups and Missions

Working Group 1:

Methods to Forecast Natural Hazard Occurrence and the Impacts on Societal Systems

Introduction

The purpose of this working group is to focus on the new approaches needed to understand and forecast natural hazard occurrence and the associated impacts on societal systems. By reviewing the existing knowledge and technology for emulation of hazards, all the current methodologies and models should be determined. By integrating solutions to different types of hazards, the barriers and the gaps in-between should be identified. The integrated model-based technology is a main objective in this group.

The overall goal of this working group is to develop a bi-lateral research agenda and a multi-year implementation plan based on the current state of scientific knowledge concerning methods to forecast natural hazard occurrence and the impacts on societal systems.

Issues to be considered:

1. What is the state-of-the-art in the modeling and forecasting of natural hazards?
2. What are the major gaps in knowledge preventing development of better predictive models of natural hazards?
3. Can multi-hazard models be employed to mitigate MCMD?
4. Do the current models provide the opportunities to make decisions in a timely manner? If not, what steps are required to provide this capability?
5. How can predictive models be embedded in the risk assessment and management process?
6. How can computational and information processing tools help in forecasting natural hazard occurrence and impacts on societal systems?
7. What barriers exist to effective sharing of data and tools, and how can they be addressed?
8. How can social vulnerability be reduced through better forecasting natural hazards in the context of MCMD?
9. What data unready exists, and what mechanisms should be used to acquire missing data?
10. What systems are needed to provide effective decision support for mitigation?
11. What impediments exist to effective decision making that could be removed by research?

Working Group 2:

Technology to Increase Societal and Infrastructure Resiliency when Exposed to Major Natural Hazards

Introduction

Both pre-disaster and post-disaster assessment and management for response and resilience from multiple hazards are needed to respond to MCMD. The complete flow path should be created by the sequence of socio-technical context, pre-disaster planning, vulnerabilities, hazard occurrence, and robustness. Each aspect can be individually discussed, and eventually the integration of all steps should be posted.

The overall goal of this working group is to develop a bi-lateral research agenda and a multi-year implementation plan based on the current state of scientific knowledge concerning technology to increase societal and infrastructure resiliency to natural hazards.

Issues to be considered:

1. What is the state-of-the-art in the modeling and forecasting natural hazards?
2. What are the barriers to assess and manage multiple hazards based on the knowledge and technology of the individual hazards?
3. What barriers exist to effective sharing of data and tools, and how can they be addressed?
4. What are the barriers to considering the sequence of events in cascading disasters?
5. What new forms of analysis and modeling are needed to increase societal and infrastructure resiliency?
6. What needs to be done to prepare for rapid acquisition of needed data during emergencies?
7. To what degree should data on social vulnerability be shared, and with whom?
8. What research needs to be conducted to better integration of socio-economic factors into disaster preparedness and response?
9. How long will the development of the integrated models and control techniques take to implement based on scenarios of disasters in the mitigation of Mega-city Mega disasters?

10. What mitigations are needed to address each type of natural hazard, and how should those mitigations be prioritized?
11. What systems and data are needed to provide effective decision support for mitigation?
12. Which agencies and levels of government should be responsible for what types of mitigation?
13. What modeling and analysis tools are needed to ensure that mitigation efforts are science-based?
14. What impediments exist to effective decision making that could be removed by research?

Working Group 3:

Assessment Techniques to Quantify the Risk Posed to Individual Infrastructure and Systems of Infrastructures

Introduction

Hazard reduction is defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. The purpose of hazard reduction is two-fold: (1) to protect people and structures and (2) to minimize the costs of disaster response and recovery. Designing to resist any hazard should always begin with a comprehensive risk assessment. This process includes identification of the hazards present in the location and an assessment of their potential impacts and effects on the built environment based on existing or anticipated vulnerabilities and potential losses. When hazard mitigation is implemented in a risk-informed manner, every dollar spent on mitigation actions results in an average of four dollars' worth of disaster losses being avoided.

The overall goal of this working group is to develop a bi-lateral research agenda and a multi-year implementation plan based on the current state of scientific knowledge concerning assessment techniques to quantify the risk posed to individual infrastructure and systems of infrastructures

Issues to be considered:

1. What is the state-of-the-art in risk assessment tools for preparedness and response?
2. What barriers exist to effective sharing of data and tools for risk assessment, and how can they be addressed?
3. What new forms of analysis and modeling are needed to support decision making by responders?
4. How should social vulnerability be incorporated into the risk assessment process in the context of MCMD?
5. What data exist, and what mechanisms should be used to acquire missing data?
6. What research needs to be conducted to better integration of socio-economic factors into risk assessment?
7. What systems and data are needed to provide effective decision support for mitigation?
8. What modeling and analysis tools are needed to ensure that mitigation efforts are science-based?
9. How can we estimate the costs and benefits of mitigation efforts?
10. What can be learned regarding risk assessment from precedents in other countries?

Working Group 4:

Post-event Management Plans that Minimize the Socio-economic Impact of Natural Hazards

Introduction

Techniques for constructing new infrastructure and retrofitting existing infrastructure should be based on best practices. Infrastructure must be sound after an disaster, and critical facilities should be reoccupied without delay. Transportation systems should be easily repaired and open for service with minimal interruption to support response and recovery efforts. Recovery will be more effective as communities are able to make informed decisions based on an improved understanding of the true costs.

The overall goal of this working group is to develop a bi-lateral research agenda and a multi-year implementation plan based on the current state of scientific knowledge concerning post-event management plans that minimize the socio-economic impact of natural hazards.

Issues to be considered:

1. What kinds of training in cyberinfrastructure are needed by responders?
2. What barriers exist to effective sharing of data and tools, and how can they be addressed?
3. What is the state-of-the-art in emergency communication and how does it need to be improved?
4. What new forms of analysis and modeling are needed to support decision making by responders?
5. What needs to be done to prepare for rapid acquisition of data during emergencies?
6. What issues of cyberinfrastructure need to be addressed by the research community?
7. What data exist, and what mechanisms should be used to acquire missing data?
8. What research needs to be conducted to better integration of socio-economic factors into disaster preparedness and response?
9. What systems and data are needed to provide effective decision support for mitigation?
10. Which agencies and levels of government should be responsible for what types of mitigation?

11. What modeling and analysis tools are needed to ensure that mitigation efforts are science-based?
12. What impediments exist to effective decision making that could be removed by research?
13. How can we estimate the costs and benefits of mitigation efforts?
14. What can be learned regarding mitigation from precedents in other countries?