

**US-Taiwan Workshop on
Advancement of Societal Responses to Mega-Disasters afflicting Mega-Cities**

Taipei, Taiwan, May 6-7, 2010

The US-Taiwan Workshop on Advancement of Societal Responses to Mega-Disasters afflicting Mega-Cities (MC/MD) was held on May 6-7, 2010 at the National Taiwan University and the National Center for Research on Earthquake Engineering (NCREE). This successful workshop was jointly organized and supported by the National Science Council (NSC) of Taiwan and the National Science Foundation (NSF) of the USA. The workshop brought together 100 researchers and practitioners in engineering, emergency response and recovery, geography, social sciences, land use policy, natural hazard mitigation, and computer and information science to explore and promote opportunities to develop more effective approaches for the grand challenge of disaster risk management in large urban areas. This two day workshop included both keynote lectures and brief oral presentations to promote an awareness of the state-of-the-art, as well as to identify the opportunities and challenges that lie ahead in the development of future mitigation technologies. To facilitate the identification of critical issues to be addressed, four working groups were formed:

- (1) Methods to Forecast Natural Hazard Occurrence and the Impacts on Societal Systems
- (2) Technology to Increase Societal and Infrastructure Resiliency when Exposed to Major Natural Hazards
- (3) Assessment Techniques to Quantify the Risk Posed to Individual Infrastructure and Systems of Infrastructures
- (4) Post-event Management Plans that Minimize the Socio-economic Impact of Natural Hazards.

Working group participants identified major interdisciplinary research themes that exemplify the scope of the cross-disciplinary research envisioned by the workshop participants. These critical issues are formulated to promote a common framework in disaster modeling and mitigation that leverages the existing global research infrastructure for multinational cooperative collaboration. This framework will provide a foundation upon which formal bilateral US-Taiwan and multi-lateral international joint research efforts can be based. Successful completion of the identified research areas will result in safer and more resilient structures, more secure urban environments, stronger economies, and improved public health, all of which are factors in enhancing the overall quality of life of our society. Equally important is the development of new integrated interdisciplinary programs for education of the next generation of engineers and scientists to carry out MC/MD research; such efforts should be strongly encouraged and supported by NSF and NSC.

The participants wish to draw the attention of both NSF and NSC to the possibility of extreme instances of MC/MD that are far more severe in their impacts than any events in the recent historic record. Addressing these possibilities will require a willingness to think “outside the box”, and will significantly challenge the imagination of the research community. As a result, unanimous support is given to the following recommendations:

- NSC and NSF should give high priority budget consideration for cross-disciplinary/multi-disciplinary research in MC/MD science and technology.
- To establish a vibrant MC/MD research community across the Asia Pacific region, both NSF and NSC should place emphasis on jointly-funded bilateral US-Taiwan cooperative research, as well as multi-lateral cooperative research with other Asia-Pacific countries which share the same interest in MC/MD science and technology.
- NSC and NSF are encouraged to break existing cultural and organizational barriers and budgetary constraints within its internal departmental entities so that it can develop a new framework for shared support of a cross-disciplinary approach to research.
- NSC is urged to use their science, engineering, and technological empowerment to coordinate relevant governmental and nongovernmental agencies at all levels in disaster preparedness, search and rescue, post-event response and recovery, particularly in enabling of real-time disaster data harvesting and sharing, and other critical emergency management issues.
- Efforts that can be launched on a collaborative university-government-industry platform should be particularly encouraged.
- Multi-dimensional team-based investigations cutting across traditional disciplinary boundaries are particularly encouraged. High-risk and high-payoff research having good potential for MC/MD science and technology innovation should be considered for funding with high priority.
- To address critical research needs and tackle the grand challenges in the MC/MD area, high priority should be placed on training the next generation of high quality, interdisciplinary researchers who are equally knowledgeable in the necessary fields to conduct MC/MD research. NSC and NSF are strongly urged to create a paradigm-shift in academic programs to produce future students with cross-disciplinary MC/MD knowledge and skills.