

**5TH INTERNATIONAL WORKSHOP ON REMOTE SENSING APPLICATIONS
TO NATURAL HAZARDS
The George Washington University
Washington D.C.
September 10-11, 2007**

WORKSHOP RESOLUTIONS

The following resolutions have been agreed upon by all workshop participants:

- 1) The 5th International Workshop on Remote Sensing Applications to Natural Hazards held at the Elliott School of International Affairs of the George Washington University in Washington D.C. on September 10-11, 2007, was the most successful workshop to date in this series; Over 30 participants from seven different countries delivered 20 presentations on a broad set of topics dealing with remote sensing, disaster response and advanced technologies.
- 2) In response to last year's resolutions, a one-day post-workshop symposium was organized by George Washington University and MCEER that was designed to educate decision and policy-makers on the use and value of remote sensing technologies for natural hazard loss reduction.
- 3) In an attempt to establish future research priorities for remote sensing and its use in disaster management, the following set of questions were discussed in two breakout workgroups. After each question is a summary response from the two groups.
 - What are the most significant research challenges that remain in the remote sensing disaster management (RSDM) area?
 - Enhance interdisciplinary and international communication; address privacy issues; and secure funding sources to further develop remote sensing metadata standards, data standards, data availability, data exchange, sensor fusion, automated techniques, integration with modelled data, and implementation for RSDM
 - What are some of the impediments that are preventing us from making major breakthroughs in research and in applications?
 - Access to recent remote sensing (RS) data is often driven by disaster events or differences in the national/international interests of civil protection, military, or industry and therefore not rapidly available for to the international research community.
 - Targeting funding towards key priority disaster research areas is a major factor in accelerating progress.

- What opportunities exist that are not being leveraged in order to make more significant progress in research and applications/implementations?
 - Use our expertise to develop a specialized open data policy, identify constituency, and approach policy makers to get access and resources to remove existing impediments and enhance the collaboration amongst interdisciplinary and international teams
 - Invest planning and resources to link research community to response agencies
 - Do you think we are making good progress in research and practice to in order to have an impact on hazard mitigation, response or recovery?
 - While the focus has been on disaster response to specific hazards, we realize that there is the need to develop an integrated, multi-hazard approach to managing disasters, involve stakeholders and first responders
 - What do you think our role should be in disaster management activities in 5 years?
 - Take a global leadership role in actively designing, developing and implementing procedures to establish and facilitate access (e.g. UN SPIDER) to benchmark data sets and data standards to effectively and efficiently implement and exchange RS data, techniques and tools for RS data in close collaboration with end users such as emergency managers for pre-disaster preparedness
- 4) In addition, Professor Masanobu Shinozuka provided a personal perspective on the progress of this workshop series and with the area of remote sensing in general. His vision of how remote sensing can help in improving urban infrastructure highlighted new and complex challenges (e.g. modeling, simulation and the use of in-situ sensors) for researchers in the future.
 - 5) This fifth workshop included discussions (applications) on damage detection methods for earthquake, hurricane wind and surge, flood, tsunami and “near earth” objects; application of remotely-sensed data in response and recovery; new technologies that would promote a better understanding of hazards and risk, especially in predicting earthquake occurrences. In addition, an informative presentation by E. Rathje and B. Adams on an evaluation of earthquake damage scales and methodologies was presented using data from the 2003 Bam, Iran earthquake.
 - 6) To publicize the results of this workshop, a *Workshop Website* will be created by The Space Policy Institute at the George Washington University. It will contain the details of this workshop, as well as information on the next workshop.
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- 7) The 6th International Workshop on Remote Sensing Applications for Disaster Response will be hosted by the University of Pavia in Pavia, Italy in late

September 2008. The Theme of the next workshop: “The Future of Remote Sensing in a Multi-hazard, Globalized World”. Specific topics will include: a) the “future” of research using multiple data sources and data fusion; b) multi-hazards, with dedicated invited sessions; c) global view and global (region-adaptive) models, and the topics of previous workshops.

- 8) A journal article in EERI Spectra that expands on the preliminary analysis presented by Rathje and Adams; expanded discussion on the basic requirements of a standardized damage scale with examples, and possible extensions to other hazards.
- 9) The participants of this workshop reiterate their desire to develop a common (benchmark) data set (beyond the Bam, Iran earthquake) for use by its members to compare, validate and assess techniques potentially useful for Disaster Response Applications and Research. These data should be uniformly processed to uniform standards and provided to the Workshop participants in standard data formats. Future discussions should center on event, geographic extent, damage measures or indices, etc. for this comparisons. An effort will be made to achieve this objective in time for this next workshop.
- 10) Encourage organizations that have an interest in remote sensing and disaster response to create and contribute to a centralized website for sharing data, information and other resources
- 11) The 6th Workshop in Pavia should strive to include members of the Global Disaster Management Community. This can be accomplished through their direct participation or through workshop participants reporting interactions with each other at other professional meetings. The goal of this effort is to identify areas where the data needs of the user community are identified and data format requirements specified.
- 12) A long term goal of this workshop series is to integrate with other events where a larger User base may be available to attend.

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