Session II – Envisioning New Approaches to Managing Great Deltas, Great Rivers, and Great Lakes
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Vulnerability-Exposure-Sensitivity-Resilience (VESR): A Geospatial Vulnerability Assessment Methodology and Its Application in the Lower Mekong River Basin

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Abstract

Vulnerability-Exposure-Sensitivity-Resilience (VESR) is an advanced, multi-hazard methodology for assessing the spatial variability of vulnerability to natural hazards, as well as their impacts on the people, infrastructure and institutions within a region. VESR methodology addresses the questions "How does vulnerability vary across the region?" and, more importantly, "What can be done to reduce vulnerability and its underlying components?" Accordingly, this methodology provides necessary information to policy makers and disaster managers for allocating resources, including mitigation and disaster response funding and infrastructure improvement investments. It also allows one to examine the potential effects on a region's vulnerability of *non-disaster* reduction policies in related areas such as environmental and natural resources management, regional development, and poverty alleviation.

The Pacific Disaster Center (PDC) has applied this methodology to assess flood vulnerability in the Lower Mekong River Basin as follows:

- Exposure was determined as a function of the depth and duration of a two-year flood event as compared to a 20-year flood event.
- The presence of vulnerable populations was assessed using the Landscan 2003 global population data, which provides estimates of daytime population in 1km x 1km cells.
- Sensitivity was estimated as a function of the population's fragility, awareness, and physical location.
- Resilience was expressed using parameters that treated social capacity to recover as a function of food and water security, economic resources, and government effectiveness.

The parameter surfaces were combined to create a final Vulnerability Surface that provides a visual representation of the vulnerability of the population of the Basin to flood disasters. Final VESR surfaces (maps) as well as key indicators will be displayed and discussed. Additionally, a scenario for utilizing these "baseline" measures to gain

insight into potential outcomes of programs which impact one or more of the variables contributing to overall vulnerability will be illustrated.