

Characterization of Impact: a Tool for Hazard Mitigation and Risk Assessment

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Mitigation measures are most effective when designed to counteract specific causes of damage generated by a hazard. Consequently, identifying and understanding the damage components of a given hazard is an important step in assessing the vulnerability of a building or facility.

Damage components are ingredients of a hazard capable of causing direct damage, such as wind pressure, water pressure and wave impact from storm surge, flying debris impact and floating debris impact, generated by a hurricane.

Equally important in vulnerability assessment is understanding the causality of damage, meaning what happens and how, when a specific damage component interacts with a building during a hazard event.

Relative to this, the main objective of vulnerability assessment is to set a foundation for risk assessment and the identification and design of effective mitigation alternatives to reduce the potential for damage to a building from the impact of a hazard.

Toward that objective, a critical step is characterizing the site-specific impact on the building of interest. This involves quantifying the forces applied to the building by various damage components, and analyzing how local natural and human factors may act as impact modifiers by exacerbating or softening the actual effect of such impact. Characterizing the impact leads to design criteria for the implementation of effective mitigation measures.

A formidable challenge in characterizing future impacts is to incorporate damage components being exacerbated by climate change hence continuously changing over time, such as it is happening with storm surge and wave impact affected by global warming.