

Center for Computational Modeling and Simulation

Workshop Welcome

Simulation and Data Needs to Support Disaster Recovery Planning

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NSF award: CMMI 1612843

NSF Sponsors Research to Reduce Impact of Natural Hazards



Source: https://upload.wikimedia.org/wikipedia/commons/b/b9/Amazing-natural-disasters.jpg





Natural Hazards Engineering Research Infrastructure

NSF's Facilities/Programs



SimCenter Mandate

To produce Extensible Software that Researchers in Natural Hazards Engineering can use in their research

- Develop an open-source computational framework for building workflow applications to support decision-making to enhance community resilience to natural hazards in the face of uncertainty;
- Design a framework that is sufficiently flexible, extensible, and scalable so that any component of it can be enhanced to improve the analysis and thereby better meet the needs of the community;
- Seed the framework with enough data and interfaces to existing simulation tools so that it can be employed in the near-term;
- Release tools/applications built using this framework that meets the computational needs of researchers in natural hazards engineering;
- Provide an ecosystem that fosters collaboration between scientists, engineers, urban planners, public officials, and others who seek to improve community resilience to natural hazards. Deliver educational materials to build human-capital capacity.



Leadership Group





Software Development Team







Peter (UW), Michael, Adam (Stanford), Frank, Charles, Wael, Pedro (UW)



Domain Experts

Additional experts in engineering, urban planning, social science, and computer and information science











Patrick Lynette

Alex Taflanidis



Jack Baker



Ann-Margret Esnard



Joel Conte



Vesna Terzic





Ewa Deelman











Stella Yu



Paul Waddell



Camille Crittenden

















Tracy Kijewski-Correa Michael Motley



Advisory Board Members

Jacobo Bielak (CMU)

- Expert in ground motion and large software projects
- Reggie DesRoches (Rice, Board Chair)
 - Expert in earthquake engineering and management of organizations

Rick Luettich (UNC)

Expert in surge modeling and large software projects

Philip Maechling (USC - SCEC)

Ground motion expert and large software projects

Janiele Maffei (California Earthquake Authority)

Structural engineer and expert in public policy around hazards

Sankaran Mahadevan (Vanderbilt)

Expert in Uncertainty Quantification

David McCallen (UN Reno, Formerly LBNL, LLNL, UCOP)

• Expert in structural model, management of large projects

Peter Vickery (Applied Research Associates)

Expert in wind modeling



NHERI SimCenter

"Transforming the nation's ability to understand and mitigate adverse effects of natural hazards on the built environment through computational simulation"



SimCenter W

Last Points

- Relatively new project 3.25 years old:
 - Origins of features are Grand Challenge driven, NHERI Science Plan driven
 - Aims to be community driven
 - Initial funding 5 years, 4-year extension anticipated
- All software is opensource including building inventories
 - <u>http://SimCenter.DesignSafe-Cl.org</u>
 - <u>http://github.com/NHERI-SimCenter</u>
- The Center is open for collaborations: Looking to help facilitate research
- Follow us on Twitter & Facebook. Subscribe to our newsletter. Come to our workshops. Attend our webinars. Most importantly <u>contribute</u>.

