Weather & Risk

Building Societal Resilience through Graceful Failure:
Responding to extreme weather and climate

Spring 2015

I. Description

Catastrophic failures of the built and natural environment due to weather and climate extremes have become all too familiar. Graceful failure embodies consideration of resilience to extreme weather and climate events by incorporating emergency response at both the research and planning/design stages.

Addressing resilience from this perspective requires strong links between engineers, planners, managers, and scientists. Representatives from these groups came together for two NCAR workshops that led to the establishment of the Engineering for Climate Extremes Partnership (ECEP, www.ecep.ucar.edu) to address the impacts of—and response to—such extremes and the related issues.

Current partners include a range of organizations from industry and business, local and federal government, and academia.

II. Stage of Research and Development

The current major ECEP focus is on the Global Resilience Improvement Program, which is aimed at supporting community planning and design through a combination of strategic research and development of new tools in statistical/dynamical prediction, impacts indices, and risk management approaches targeted at specific needs. All development is undertaken through close collaboration between all parties, and all tools will be supported at NCAR as a public facility.

Current research and development applications include:

• Developing a public-domain risk modeling and response data library and planning tools in support of engineering design, planning, and adaptation activities.
• Developing impact potential indices for extreme events to assist with quantifying the risks arising from different climate scenarios and to support assessment of the impacts of imminent weather events.

• Understanding the tendency for the impacts of extreme events to cluster in time and space.

• Understanding the drivers of change in extreme weather and climate impacts

## III. Funding Status

**Seeking additional funding for:**

- **Dedicated time** (salary) for a team of scientists to work with external groups on coordinating workshops and conducting research and development to develop priority tools and support systems with a focus on extremes:
  
  o Four months of senior-scientist salary for project leader: $130K
  
  o Dedicated salary/time for a group of junior scientist/engineers to prepare workshops, conduct surveys, and research and develop specific community tools: Three years work-time in total $630K
  
  o Six months of dedicated time for a computer scientist to set up and conduct specialized climate and weather simulations as required: $104K

- **Travel and incidental costs:** $24K

**Total development costs:** $888K

**Project Period:** 2 years

All funders of over $200K will be invited to join the Engineering for Climate Extremes Partnership and thus contribute to and influence the priorities and overall development of the entire program.

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**Contact**

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