

Extreme Events Reconnaissance: Social Science and Interdisciplinary Research in the Disaster Aftermath



NSF-EAGER Award
#1745611



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Natural Hazards Center

University of Colorado Boulder

*We envision a just and equitable world where knowledge is applied
to ensure that humans live in harmony with nature.*







How can we collaborate even more effectively as social scientists and in interdisciplinary teams to reduce the harm and suffering caused by disaster?



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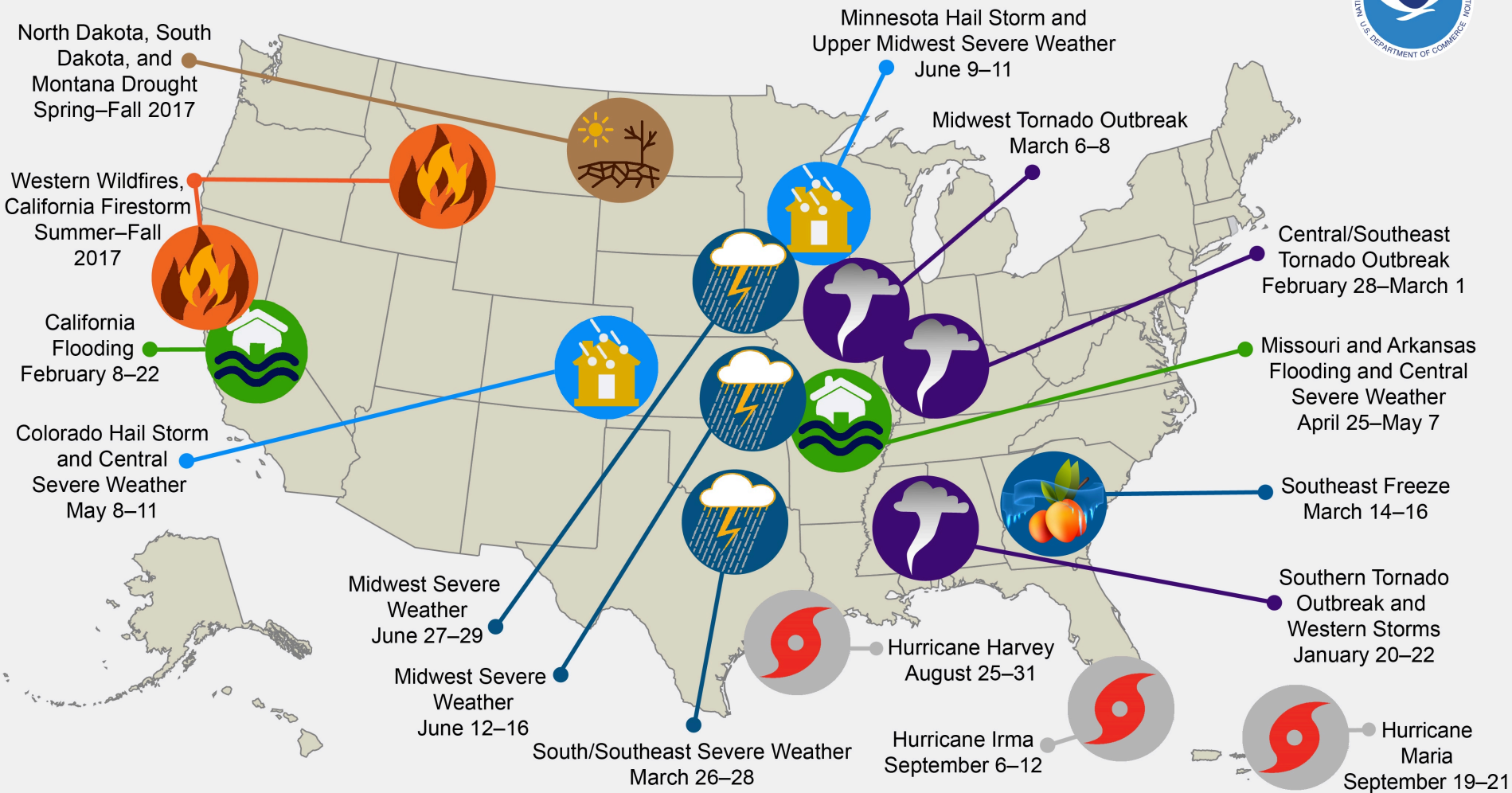
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U.S. 2017 Billion-Dollar Weather and Climate Disasters



*This map denotes the approximate location for each of the **16 billion-dollar weather and climate disasters** that impacted the United States **during 2017**.*

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What if “the big one” strikes tomorrow?

How will the social science and interdisciplinary hazards and disaster research communities respond?

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What if “the big one” strikes tomorrow?

How will the hazards engineering and disaster social science research communities respond?

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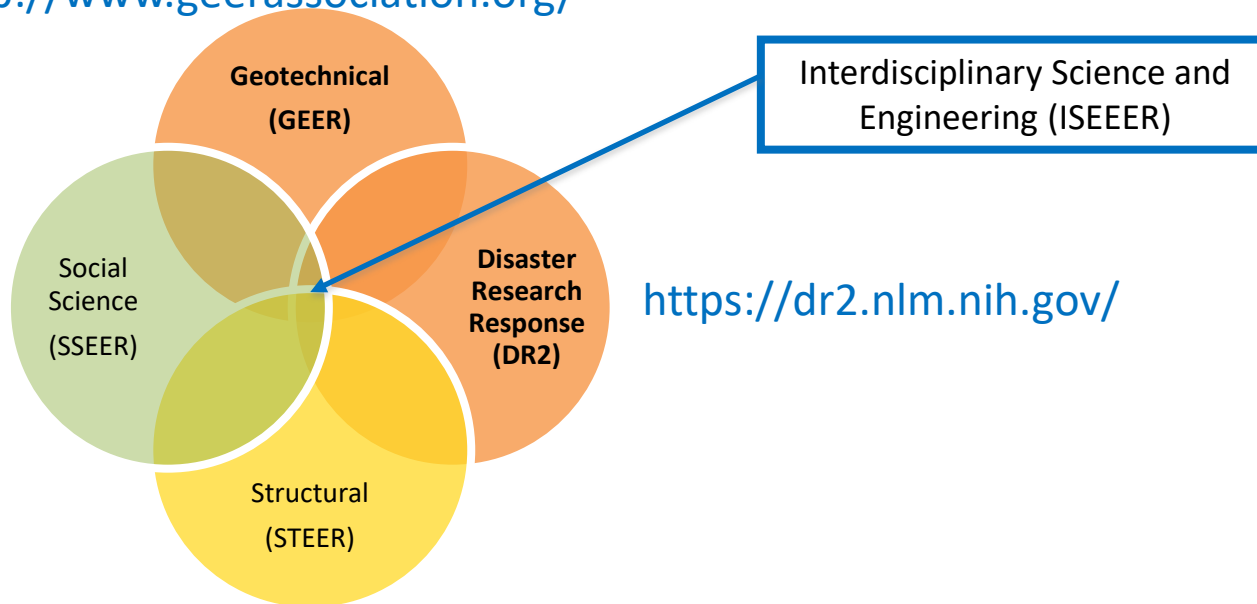
Purpose

To establish a platform and network for all-hazards
Social Science Extreme Events Reconnaissance (SSEER) and
Interdisciplinary Science and Engineering Extreme Events
Reconnaissance (ISEEER)

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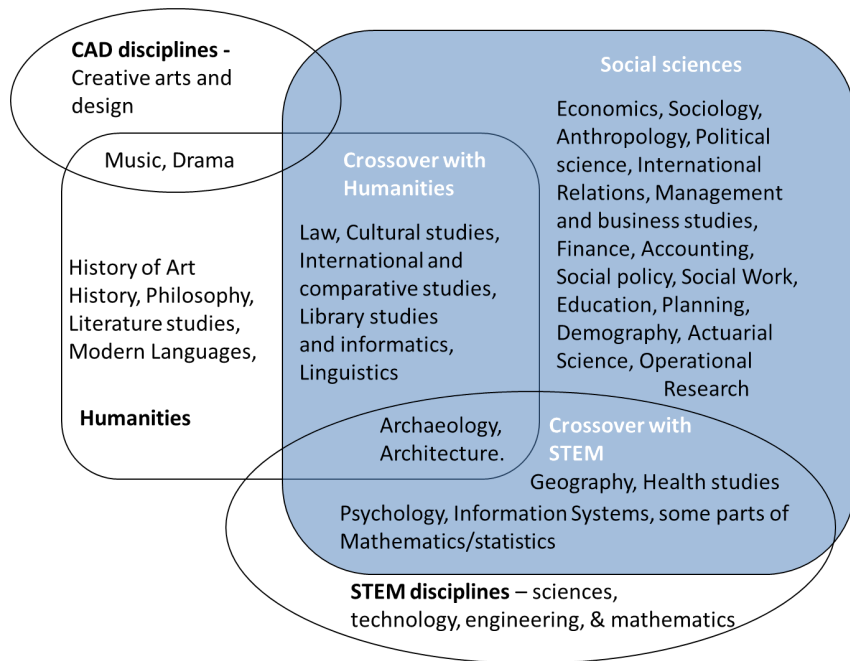
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<http://www.geerassociation.org/>



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Social Science Extr^em^e Events Reconn^aissance
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Vision

For hazards and disaster researchers to be prepared
to carry out extreme events reconnaissance research
that is *coordinated, comprehensive, coherent, ethical,*
and scientifically rigorous.

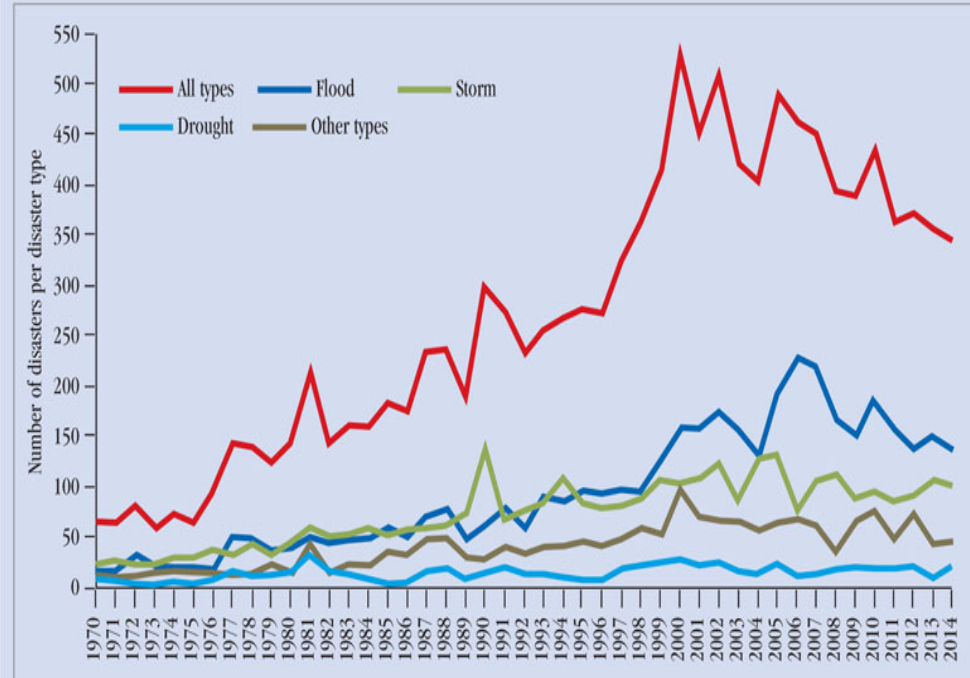




A New Approach for Rapid Reconnaissance Research
is Urgently Needed

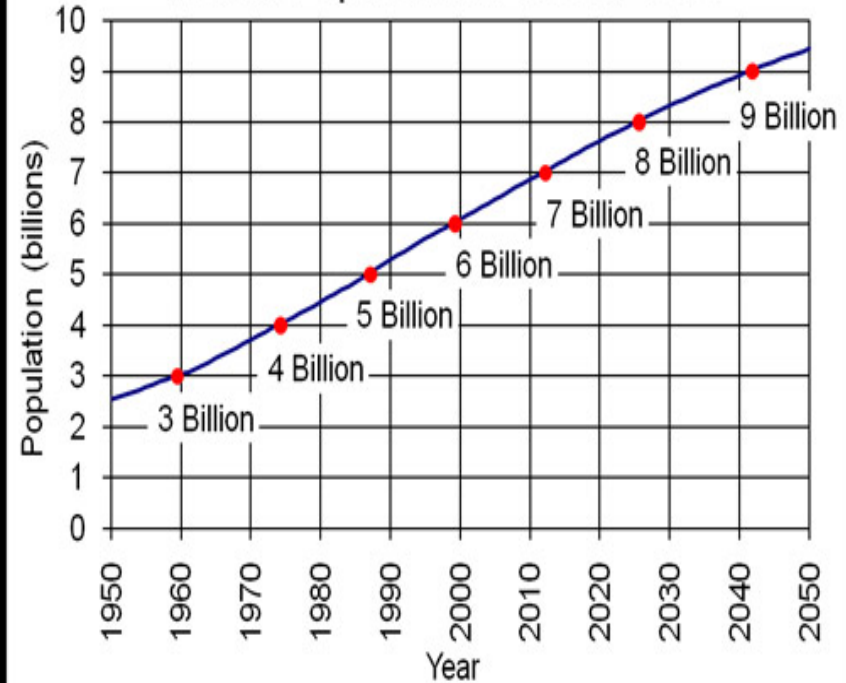


Figure 1: Natural disasters frequency globally between 1970 and 2014



Source: EM-DAT

World Population: 1950-2050



Source: U.S. Census Bureau, International Data Base, June 2011 Update.

A New Approach for Rapid Reconnaissance Research
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Challenges to the Advancement of Extreme Events Reconnaissance

1

Lack of Identification and Coordination of Researchers

2

Inadequate Guiding Research Frameworks and Insufficient Catalog of Research Approaches

3

Over-Emphasis on Large-Scale, Sudden-Onset Extreme Events

4

Cross-Sectional Data Collection, Time Scale Deviations, and Lack of Replication

5

Lack of Interdisciplinary Integration in Rapid Reconnaissance Teams

1. Lack of Identification and Coordination of Researchers



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1. Lack of Identification and Coordination of Researchers

- Duplication of effort

If engineers go off “like cowboys riding on their own, you end up with five reports on the same building collapse” – Tracy Kijewski-Correa, Univ. of Notre Dame

1. Lack of Identification and Coordination of Researchers

- Duplication of effort
- Ethical issues
 - researchers with limited knowledge of affected areas, no time for literature reviews, lack of cultural competence
 - negative impacts for researchers in affected communities and emergency response operations
- **Opportunity:** Identifying and mapping core, periodic, or situational researchers in the field
- Ethics training in advance for all

2. Inadequate Guiding Research Frameworks and Insufficient Catalog of Research Approaches

Zone # 11
Hu's = 60
Household Surveys

Includes
Overview Map
Spreadsheet
Checklist

Zone # 12
Hu's = 66
Household Surveys

Includes
Overview Map
Spreadsheet
Checklist

Zone # 13
Hu's = 20
Damage
Assessments

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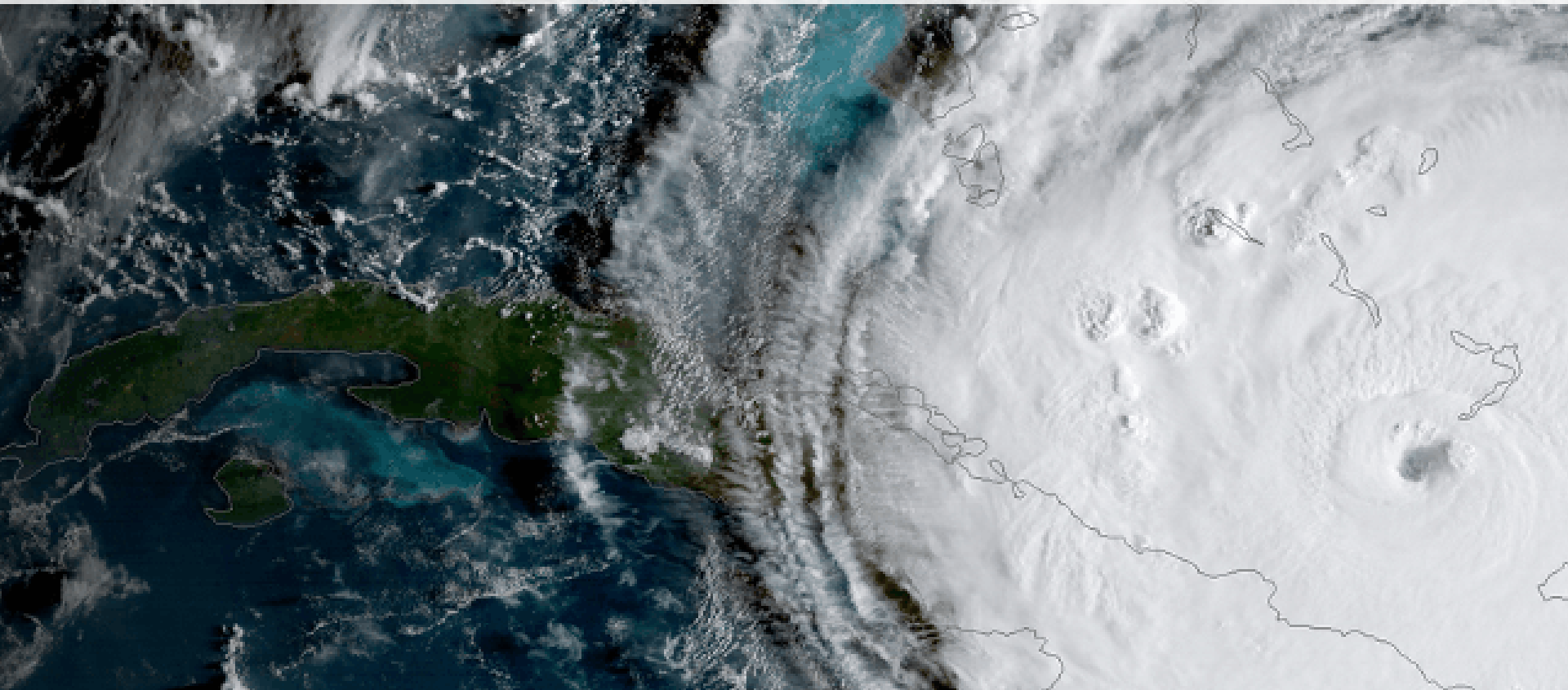


2. Inadequate Guiding Frameworks and Catalog of Research Approaches

- Research approaches at present: inductive and exploratory, small scale, convenience samples
- No systematic inventory of research instruments and standardized scales and measures leads to “homemade scales”
- No catalogue of publically accessible and privately available secondary data sets and sources
- **Opportunity:** create multi-scale frameworks
- Inventory and catalog standardized validated scales and measures



3. Over-Emphasis on Large-Scale, Sudden-Onset Extreme Events



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3. Over-Emphasis on Large-Scale, Sudden-Onset Extreme Events

- “Paradigm of the Extreme”
 - Large scale
 - Urban
 - Developed nations
- **Opportunity:** Learn from chronic, small-scale, repetitive loss events to test theoretical and conceptual applicability of prior rapid reconnaissance studies

4. Cross-Sectional Data Collection, Time Scale Deviations, and Lack of Replication



4. Cross-Sectional Data Collection, Time Scale Deviations, and Lack of Replication

- Engineers and social scientists need to enter and exit the field at different moments post-disaster
- Data Collection
 - Short-term, single point in time, completed within one year of event
- **Opportunity:** prepare to enter the field, sync up time scales, encourage long-term studies, replicate studies

5. Lack of Interdisciplinary Integration in Rapid Reconnaissance Teams

Scheduled Meetings, Tues, Nov 29

10am Duke Energy (Networks Team)
(@ hotel) John, Ken, Hana, Jenn H, Jen T-G

1pm Public Works (Networks Team)
(including water; wastewater) John, Ken, Hana, Jenn H, Jen T-G

2pm Recovery Coordination Meeting (Social Science Team)
Robeson County Offices Jen T-G, Maria D, Judy, Derya, GE Engineer

Advance Team: Jamie + Network Team
→ complete clusters 11 & 13 (~1 hr max)

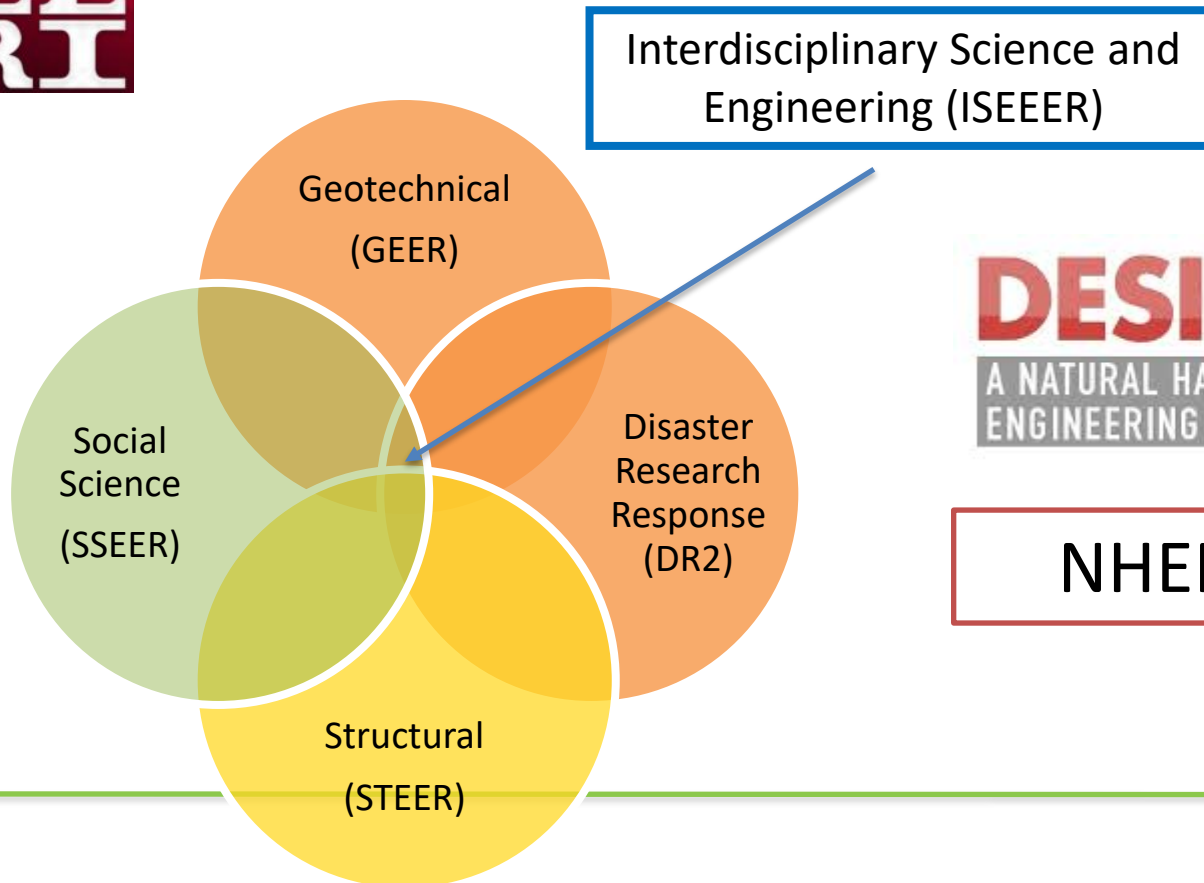
Mixed Team 1	Mixed Team 2	Mixed Team 3	Mixed Team 4	Mixed Team 5
Walt Maria R	Nathanael Derya	Andre Maria D	Bill Steve Mehrddad	Elaina Judy Shane



5. Lack of Interdisciplinary Integration in Rapid Reconnaissance Teams

- Interdisciplinary work is difficult and time consuming – rapid reconnaissance studies, by their very nature, necessitate rapid team formation and deployment
- **Opportunity:** establish interconnected platforms, take a systemic and measured approach, advance the field

Responding to Rapid Reconnaissance Challenges



NHERI RAPID Facility



Science of Team Science



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Science of Team Science

- Examines the processes by which scientific teams *organize, communicate, and conduct research*
- *Micro-level processes and macro-level conditions*
- Helps to understand how teams collaborate to achieve scientific breakthroughs that would *not be attainable* through either individual efforts or a sequence of additive contributions

Next Steps

1

Establish Social Science and Engineering Advisory Committees

2

Convene a Meeting of Science of Team Science and Rapid Reconnaissance Team Leaders

3

Identify and Coordinate SSEER Researchers

4

Identify and Coordinate ISEEER Researchers

5

Establish Scientific Frameworks for Rapid Reconnaissance Research

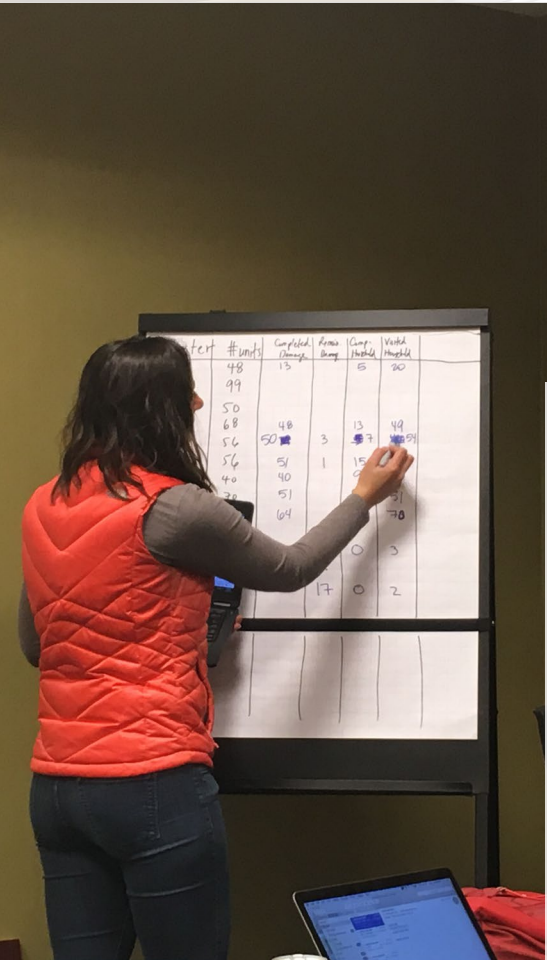
6

Catalog Research Instruments and Data Sets

7-9

Convene Meetings of SSEER and ISEEER Researchers and Widely Disseminate Project Deliverables

Thank you!



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