

FEDERAL BRIEFING



Rapid Response Disaster Research: NSF-Supported Research Networks and Resources

CONVERGE Leadership Corps

converge.colorado.edu/research-networks/leadership-corps

Overview



1:00-2:00 p.m.

Federal Briefing*

1:00-1:05 p.m.

Welcome

1:05-1:45 p.m.

CONVERGE Leadership Corps Federal Briefing

1:45-2:00 p.m.

Questions, Comments, and Information Sharing

**Recorded Session*



2:00-3:00 p.m.

Federal Partners Meeting

Federal Briefing: Objectives

(1) Introduce the
CONVERGE
Leadership
Corps



(2) Describe Our
Mission and
Activities



(3) Share
Information
Regarding NSF-
Supported
Research
Networks and
Resources



(4) Understand
How We Can
Most Effectively
Partner

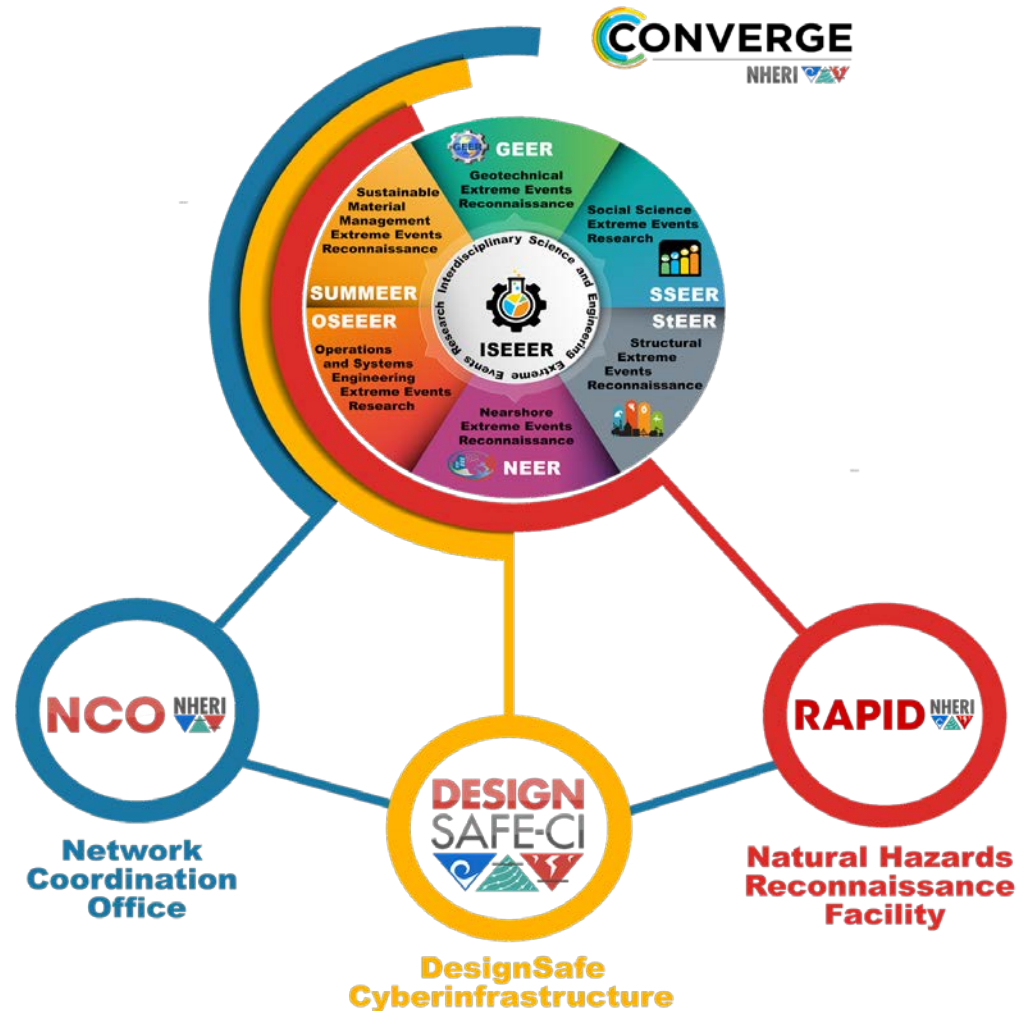


CONVERGE Leadership Corps



Established: 2019

The **Leadership Corps** brings together the principal investigators for the NSF-funded **Extreme Events Reconnaissance and Research (EER)** networks and the NSF-funded **NHERI components** that support extreme events research.







CONVERGE Leadership Corps

Mission: Advance ethically-grounded, scientifically rigorous, disciplinary and interdisciplinary academic extreme events research

- **Identify** and **coordinate** researchers
- **Mobilize** to conduct reconnaissance research
- **Educate** and **mentor** diverse researchers
- Set a **scientific agenda** to **collect common data** across disaster events
- **Publish** and **share** data

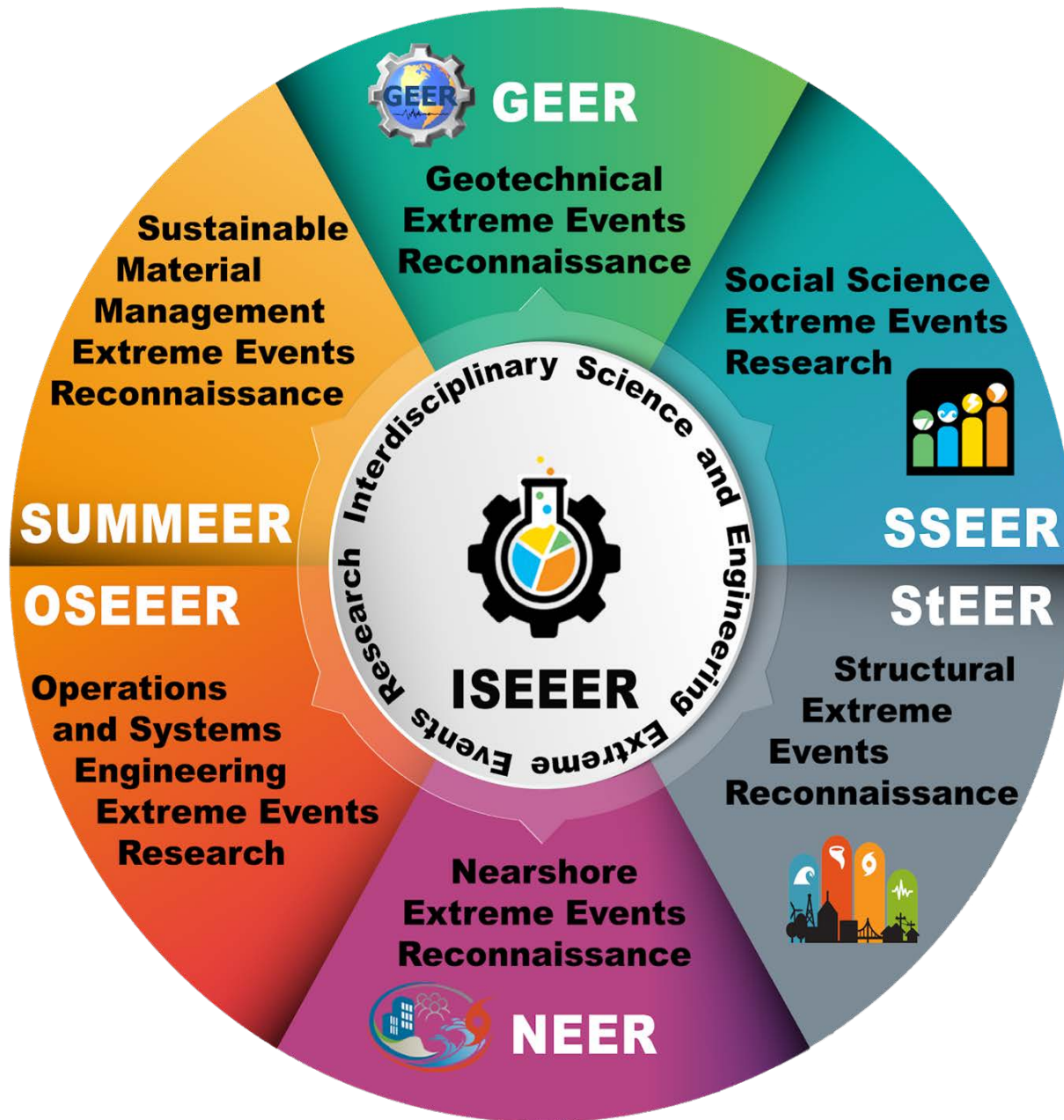




Extreme Events Reconnaissance / Research (EER) Networks

- 1. Geotechnical Engineering (GEER)
- 2. Social Sciences (SSEER)
- 3. Structural Engineering (StEER)
- 4. Nearshore Systems (NEER)
- 5. Operations and Systems Engineering (OSEEER)
- 6. Sustainable Material Management Engineering (SUMMEER)
- 7. Interdisciplinary Science and Engineering (ISEEER)





Geotechnical Extreme Events Reconnaissance

Turning Disaster into Knowledge



Year Established	2006
Membership Profile	Geo-professionals and other engineers and scientists interested in geotechnical hazards
Current Membership	~480
Primary Hazards	Earthquakes, landslides, debris flows, floods, and other events with geotechnical consequences
Major Reconnaissance Projects	2019 Ridgecrest earthquake; 2018 Hurricane Florence; (55 national and international responses since 2006)
Data Types	Perishable geotechnical data in immediate aftermath of extreme events
Website	http://geerassociation.org/



NSF Award #1826118

David Frost, PI



Structural Extreme Events Reconnaissance



Year Established	2018
Member Profile	Structural Engineers, Allied Natural Hazard Engineers Data/Computer Scientists
Current Membership	170
Primary Hazards	Earthquakes, Hurricanes, Tsunamis, Other Wind Events (e.g.,Tornadoes)
Major Reconnaissance Projects	Hurricane Michael (2018) [US-FL] Hurricane Dorian (2019) [Bahamas]
Data Types	Damage Assessments (Mobile) , Unmanned Aerial Surveys, Applied StreetView/360 Imaging, Terrestrial Scanning
Website	https://www.steer.network



NSF Award #1761461

Tracy Kijewski-Correa, PI



Nearshore Extreme Events Reconnaissance



Nearshore Extreme
Events Reconnaissance
NEER

Year Established	2019
Member Profile	Coastal physical, chemical, and biological scientists & engineers, and social, behavioral, and economic scientists
Current Membership	74
Primary Hazards	Coastal storms
Projects To Date	Expected hurricane season 2020
Data Types	Site characterization before and after events, time series data during events, socio-economic surveys
Website	https://neerassociation.org



NSF Award #1848650

Britt Raubenheimer, PI



Sustainable Material Management Extreme Events Reconnaissance (SUMMEER)

Year Established	2020
Member Profile	<ul style="list-style-type: none">- Civil engineers (const., geo. env., and tran. eng.).- Will be open to interdisciplinary scholars whose expertise lies in sustainable management of disaster materials
Current Membership	3
Primary Hazards	All waste extreme events such as hurricanes, earthquakes, wildfires, tsunamis, etc.
Major Reconnaissance Projects	Potential pilot project during the EAGER timeline
Data Types	<ul style="list-style-type: none">- Site characterization (e.g., pre-incident debris plan)- Disaster material characteristics and conditions, data related to debris management operation, etc.
Website	-



NSF Award #2014330

Juyeong Choi, PI



Social Science Extreme Events Research



Year Established	2017
Member Profile	Social and Behavioral Scientists, Public Health and Medicine, Urban Planners, and Others Concerned with the Human Consequences of Disasters
Current Membership	1114
Primary Hazards	Natural, Technological, Terrorism and Willful Violence, Pandemics
Major Contributions	First Census of Social Scientists, Mobilization of the Social Science Community through Virtual Forums, Working Groups
Data Types	Qualitative, Quantitative, Mixed Methods
Website	converge.colorado.edu/research-networks/sseer



NSF Awards #1745611, #1841338

Lori Peek, PI



https://hazards.maps.arcgis.com/apps/webappviewer/index.html?id=155485214f7462561c0996441273156

Social Science Extreme Events Research (SSEER) with Web AppBuilder for ArcGIS

File address or place

SSEER
SOCIAL SCIENCE
EXTREME EVENTS
RESEARCH

Welcome to the Social Science Extreme Events Research (SSEER) web map.

SSEER is a National Science Foundation-supported network and online platform for social science hazards and disaster researchers. The purpose of SSEER is to identify and connect social science researchers to one another, to interdisciplinary teams, and to communities at risk to and affected by hazards and disasters.

Social and behavioral scientists from around the world who study hazards and disasters are invited to join SSEER, including academic researchers, students, and applied and professional researchers in independent, government, industry, and not-for-profit sectors.

The objective of the map is to facilitate communication, coordination, and collaboration among SSEER researchers. The map highlights the location of SSEER researchers by geographic location and provides access to information about them, including their organizational affiliations, departments, and job titles. Future versions of

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converge.colorado.edu/research-networks/sseer

Operations and Systems Engineering Extreme Events Research (OSEEER)

Year Established	2019
Member Profile	Operations Research, Management Science, Human Systems Engineering
Leadership Team	RPI, University of Michigan, University of Wisconsin
Priority Focus	Robust methods for predictive decisional guidance
Thematic Areas	Data, models and methods to support comparative and longitudinal research; Critical infrastructure systems; Early Career Mentoring
Methodological Areas	Intelligent human-machine systems; Distributed vs. centralized decision making; Multidisciplinary modeling and simulation
Contact	David Mendonça, PI (mendod@rpi.edu)



NSF Award #1936967

David Mendonca, PI



Interdisciplinary Science and Engineering Extreme Events Research



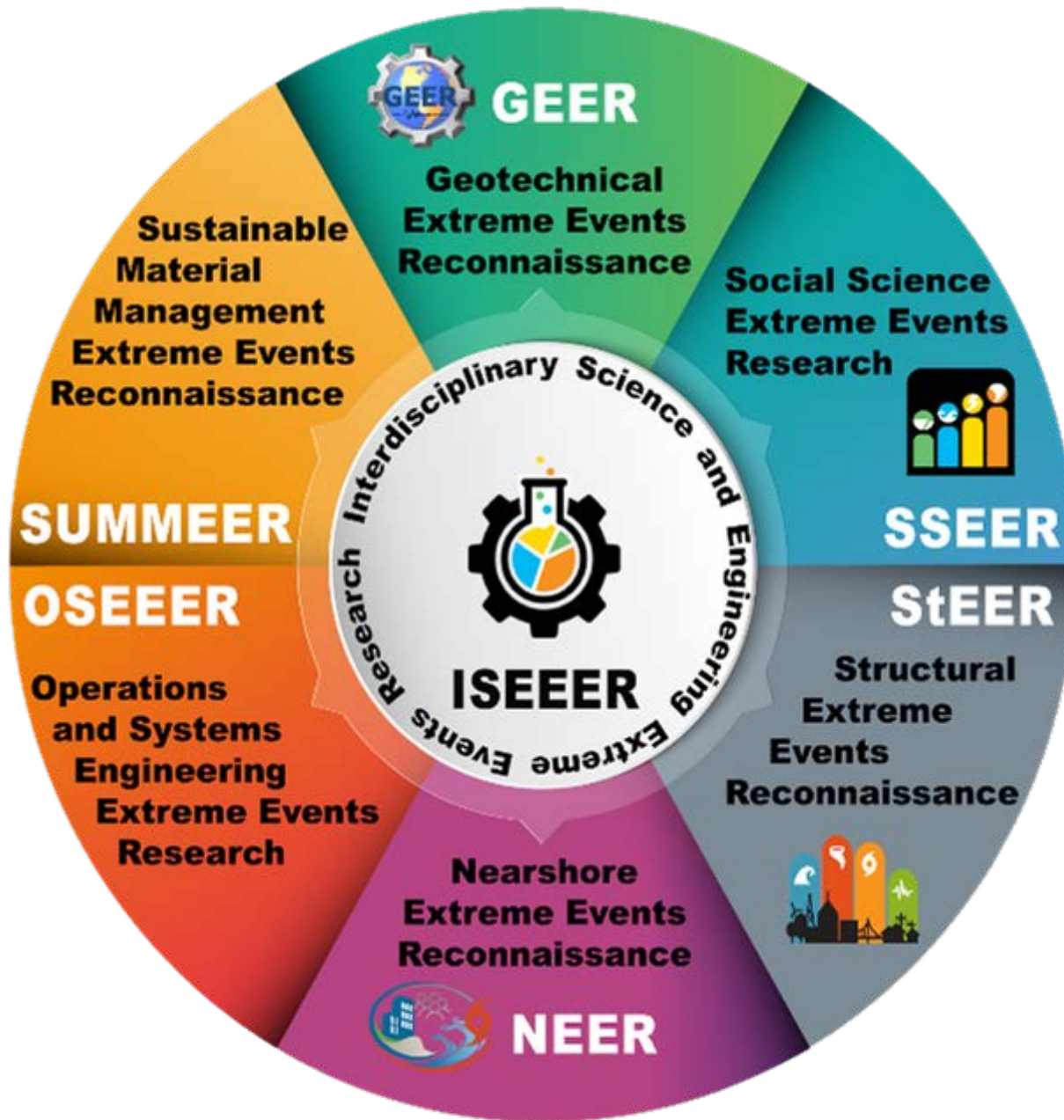
Year Established	2017
Focused On	Interdisciplinary Researchers
Primary Hazards	Natural, Technological, Terrorism and Willful Violence, Pandemics
Major Contributions	Compiling resources, publications, and other information focused on interdisciplinary research and the Science of Team Science (SciTS)
Data Types	Qualitative, Quantitative, Mixed Methods
Website	https://converge.colorado.edu/research-networks/iseeer



NSF Awards #1745611, #1841338

Lori Peek, PI





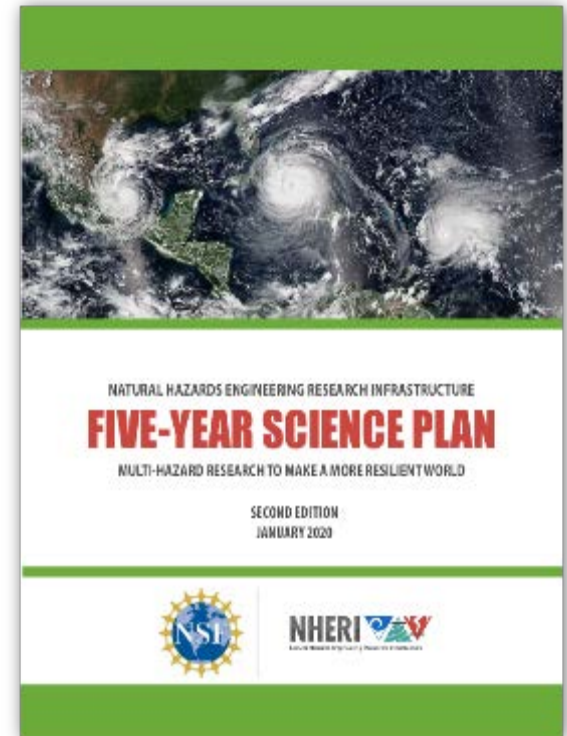
NSF's Facilities/Programs



Natural Hazards
Engineering
Research
Infrastructure



- Established: 2016
- Build Community of Users, Coordinate Components, and Lead Education and Community Outreach Activities
- Earthquake, Wind, and Coastal Engineering and Social Sciences Communities
- NHERI Infrastructure
- 2020 NHERI Science Plan
- <https://www.designsafe-ci.org/facilities/nco/>



NSF Award #1612144

Julio Ramirez, PI

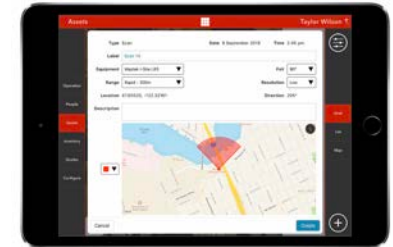


RAPID NHERI

Natural Hazards Reconnaissance



- The RAPID facility provides investigators with equipment, software, and support services needed to collect, process, and analyze perishable data from natural hazards events.
- Over 300 field instruments, RApp mobile data collection, post-processing
- Since 2018: Over 50 field missions worldwide—in support of 30+ organizations and agencies
- Trained over 200 individuals from academia and federal agencies



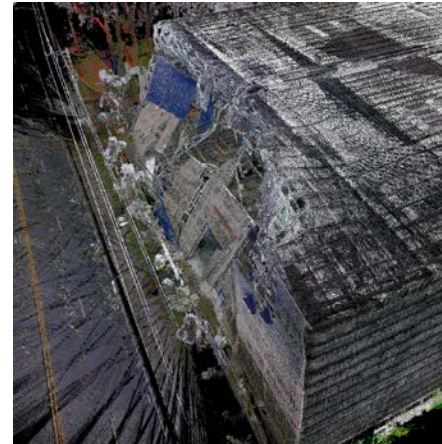
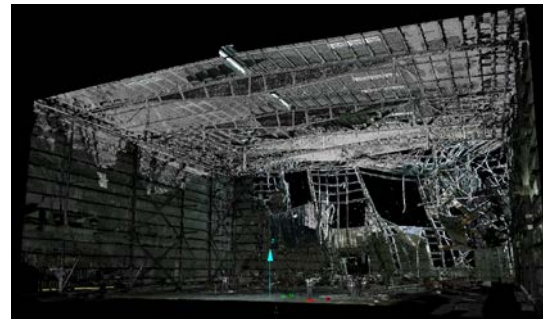
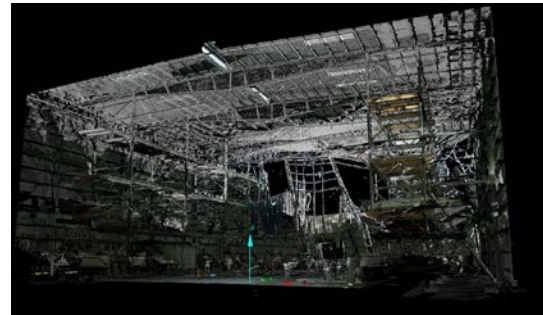
rapid.designsafe-ci.org

NSF Award #1611820

Joseph Wartman, PI



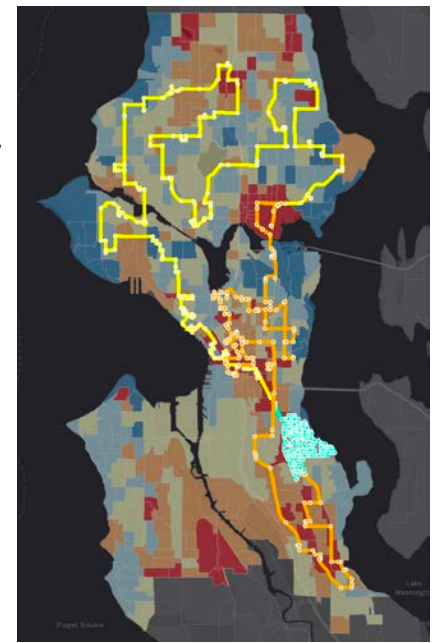
Example Data Products



2018 Hokkaido, Japan

2018 Hurricane Michael

Current Project: Covid-19 Seattle Street View Campaign



NSF RAPID Award #2031119

DESIGNSAFE-CI



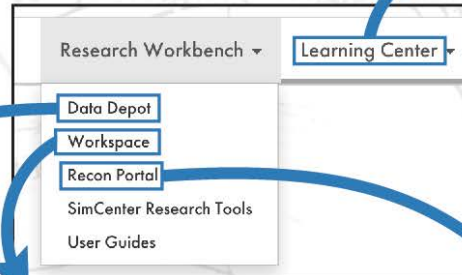
- Established 2015
- Provides data and cloud-based tools for researchers in Natural Hazards Engineering
- Data Depot, Discovery Workspace, Reconnaissance Portal, Learning Center tutorials
- Almost 5,000 users, 15 TB of public data, more than 30,000 tool invocations, over 100,000 views of online training materials
- <https://www.designsafe-ci.org/>



NSF Award #1520817

Ellen Rathje, PI





DesignSafe Tutorials

NEW End to End Multi-Threat Fragility Modeling using DesignSafe
December 3, 2019
• Watch Tutorial

Introduction to STKO
November 18, 2019
• Watch Tutorial

Leveraging Python, Jupyter Notebooks, DesignSafe, and the SimCenter Educational Tools in the Classroom
October 29, 2019
• Watch Tutorial

DATA DEPOT

Find in Published Projects

Publication Type
 Experimental Simulation Hybrid Simulation

Project Title
 Collaborative Research: Development, experimental validation and case studies for the next generation of landslide tsunami models for coastal hazard mitigation (Simulation)

WORKSPACE

Simulation [7] Visualization [8] Data Processing [2] Farmer Data Apps [5]

ADCIRC clewpeck Dakota LS-DYNA

Recon Portal

2019 Hurricane Dorian
First Landfall is at Cat 5; Elbow Cay, Abaco, Islands of the Bahamas
2019-09-09

2019 Hurricane Barry
Louisiana Gulf Coast
2019-07-13

Citable, archived datasets

Cloud-based tools for analysis

Report | Data Processing

Report | Digital Data Report (JZB02)

Model Configuration | Centrifuge Model (JZB02)

Sensor Information | C

Event | CPT (JZB02)

Event | Fast Data

Citation

Buenker, J. Brandenberg, S. Stewart, J. (2020) "Centrifuge Testing on Kaolinite Clay UCLA JZB02", in *Soil-Foundation-Structure Interaction Effects on the Cyclic Failure Potential of Silts and Clays*. DesignSafe-CI. <https://doi.org/10.17603/ds2-jpwh-nq72>.

Download Citation

Potree Viewer



Jupyter Notebooks

snapped data points:14516 intensity factor:99.39%

prototype scale

time (s)

Structural analysis diagram showing various components and dimensions.



NSF Award #1520817



Established: 2018

converge.colorado.edu


Identifying, Connecting, and Coordinating Researchers

Encouraging the Ethical Conduct of Research


Promoting Convergence Research

Resources


Part of the mission of CONVERGE is to accelerate the training and mentoring of a diverse next generation of natural and disaster researchers. To align with our mission, we are developing free, online training modules and a series of briefing sheets and check sheets to help guide extreme events research.



TRAINING MODULES



BRIEFING SHEETS



CHECK SHEETS

COVID-19 Global Research Registry for Public Health and Social Sciences

The COVID-19 pandemic underscores the urgent need for coordination, collaboration, and information-sharing among researchers worldwide. We hope those who are studying the human and societal impacts of this crisis will join this effort to build a global registry for public health and social science research.

Researchers are invited to [register their COVID-19-related project here](#). Registered projects should be focused on topics related to the social and behavioral consequences, policy responses, educational and economic impacts, and public health implications of COVID-19. The form takes approximately **10 minutes** to complete. The form is currently available in English, [French](#), [Spanish](#), and [Mandarin Chinese](#).



Sharing your information will help:

- Highlight novel public health and social science research initiated in response to COVID-19
- Expand opportunities for research collaboration and reduce duplication of efforts
- Identify unmet research needs
- Create possibilities to [share and publish](#) research instruments, data collection and ethics protocols, and data
- Set a comprehensive social science research agenda

Data Publication





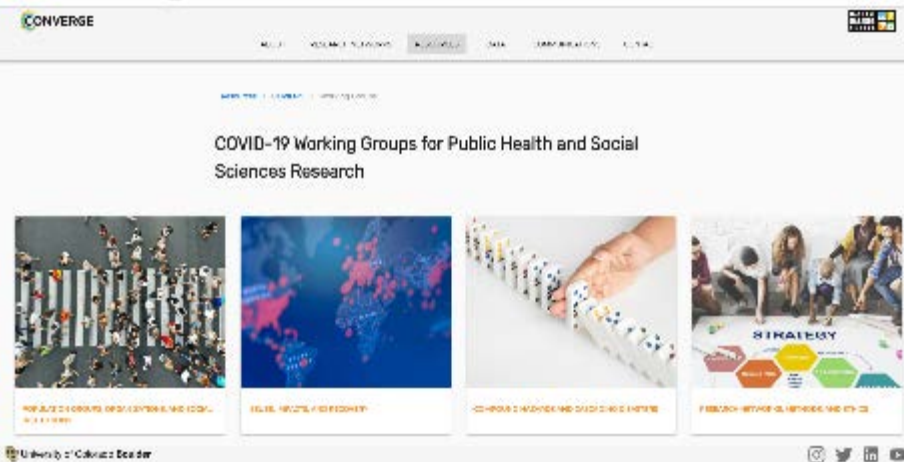
DesignSafe is the web-based cyberinfrastructure platform for the national science foundation research awards and training research information (NSF-NHERI) network. Headquarters at the University of Texas, Austin, DesignSafe provides a world-leading capability and the computational tools needed to manage, analyze, and publish critical data for natural hazards research. The DesignSafe cyberinfrastructure supports shared research and data management and visualization.

Since its launch in 2009, over 1000 researchers—primarily from engineering—have taken advantage of DesignSafe's functional sites, including shared research data, research team, and data visualization.

The DesignSafe research and development team has partnered with the CONVERGE staff of the University of Colorado Boulder and the RAPID facility, headquartered at the University of Washington, to develop a novel social science and interdisciplinary approach for natural hazards research. The collaborative research will be released by June 2020. will be the first time, show additional features, and methods of data visualization to publish registry datasets as well as new questions, questions, and model methods that research involves. The collaborative research project is available for discussion in a public forum in public domain.



NSF Award #1841338



The screenshot shows the CONVERGE website interface. At the top, there is a navigation bar with 'CONVERGE' on the left and 'HOME', 'ABOUT US', 'CONTACT', 'FAQ', 'SUPPORT', and 'HELP' on the right. Below the navigation bar, there is a header for 'COVID-19 Working Groups for Public Health and Social Sciences Research'. The main content area features four large images with corresponding text boxes below them:

- IMAGE 1:** A group of people standing around a table, looking at a laptop. Text below: 'HOW TO USE THE CONVERGE PLATFORM'.
- IMAGE 2:** A world map with red and blue markers. Text below: 'ABOUT THE CONVERGE PLATFORM'.
- IMAGE 3:** A hand placing a puzzle piece into a larger puzzle. Text below: 'HOW TO USE THE CONVERGE PLATFORM'.
- IMAGE 4:** A group of people sitting around a table, looking at a laptop. Text below: 'HOW TO USE THE CONVERGE PLATFORM'.

At the bottom of the page, there is a footer with the University of Colorado Boulder logo and social media icons for Facebook, Twitter, LinkedIn, and YouTube.

Accomplishments



Best Practices

Communications

Data Collection



CONVERGE Leadership Corps

Internal Operations Manual

I. What is the purpose of this document?

This document was developed to clarify the structure, membership, scope, and purpose of the CONVERGE Leadership Corps.

II. Who is the audience?

This document is intended to be read and used by current and future members of the CONVERGE Leadership Corps. This document will also be made available to our NSF Program Directors.

III. What are the things we should all know and be clear on when we are speaking about the CONVERGE Leadership Corps?

I. What is CONVERGE?

CONVERGE is a National Science Foundation-Natural Hazards Engineering Research Infrastructure (NSF-NHERI) facility. The mission of CONVERGE is to

- ✓ identify and coordinate social science and engineering researchers and interdisciplinary research teams before, during, and after disaster;
- ✓ advance the ethical conduct and scientific rigor of rapid response disaster research;
- ✓ support the training and mentoring of a diverse next generation of hazards and disaster researchers;
- ✓ fund virtual reconnaissance, field research, and the development of novel research instruments and data collection protocols;
- ✓ accelerate the development of mobile applications for hazards and disaster research through a partnership with NSF-NHERI RAPID.



Training and Mentoring

Data Publication



SOCIAL VULNERABILITY AND DISASTERS

DISASTER MENTAL HEALTH

Data Publication

DESIGNSAFE-CI **CONVERGE** **RAPID NHERI**

DESIGNSAFE-CI: A NATURAL HAZARDS ENGINEERING RESEARCH INFRASTRUCTURE NHERI: NATIONAL HAZARDS ENGINEERING RESEARCH INFRASTRUCTURE RAPID: Post-disaster Rapid Response Research Facility

DesignSafe is the web-based cyberinfrastructure platform for the National Science Foundation Natural Hazards Engineering Research Infrastructure (NSF-NHERI) network. Headquartered at the University of Texas at Austin, DesignSafe provides a secure data repository and the computational tools needed to manage, analyze, and publish critical data for natural hazards research. The DesignSafe cyberinfrastructure supports cloud-based research workflow, data analysis, and visualization.

Since its launch in 2015, over 3,000 researchers—predominantly from engineering—have taken advantage of DesignSafe functionalities, publishing almost nine terabytes of data across more than 100 datasets.

The DesignSafe research and development team has partnered with our cross-site facility here at the University of Colorado Boulder and the **RAPID facility**, headquartered at the University of Washington, to develop a novel social science and interdisciplinary data model for natural hazards research. This data model—which will be released by April 2020—will, for the first time, allow social and behavioral scientists and members of interdisciplinary teams to publish legacy datasets as well as new qualitative, quantitative, and mixed methods field research data specific to hazards and disaster research. In addition, the data model is robust enough for researchers to publish data

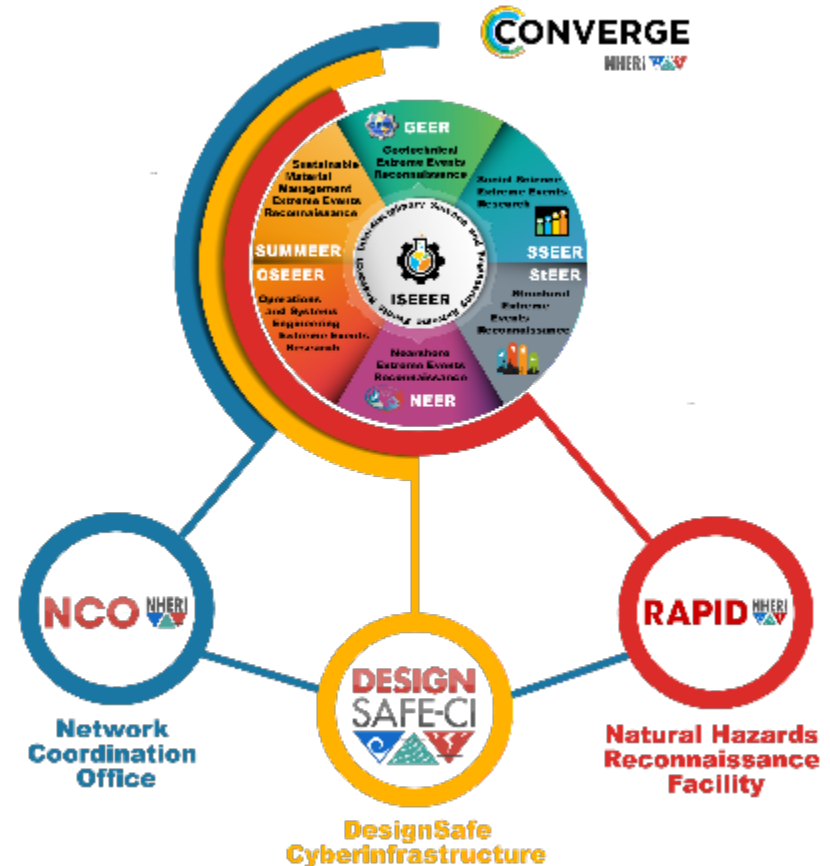
CONVERGE Leadership Corps



For the first time, academic hazards-focused, disciplinary and interdisciplinary communities are working together on a large scale to advance:

- research coordination
- ethical best practices
- scientific agenda setting
- systematic data collection
- data sharing and publication

Now... How can we collaborate better with you and the communities you serve?



Thank you!

Comments, Information Sharing,
Questions?