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

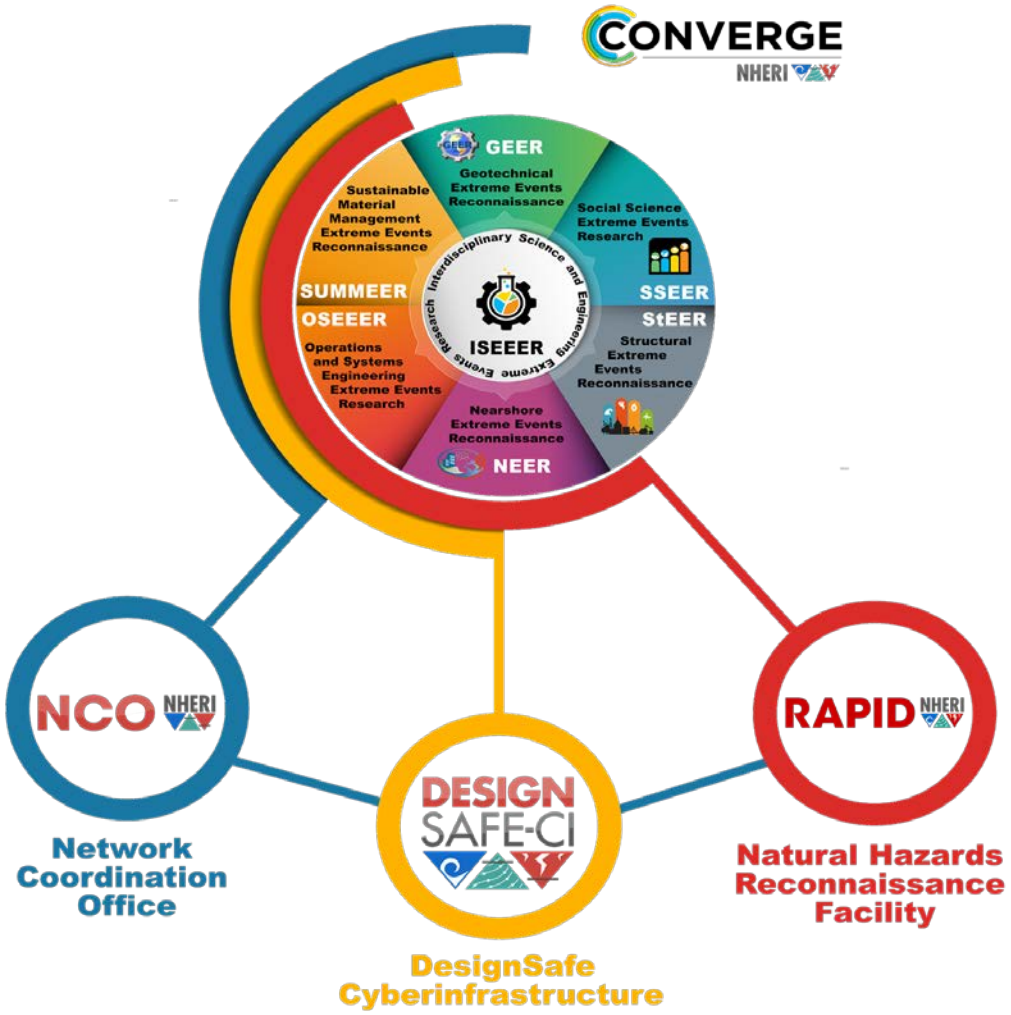
(3) Share Information Regarding NSF-Supported Research Networks and Resources

(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.




NCO
NHERI-NCO
NHERI-Network Coordination Office
CMMI-1612144


Accelerating Research: Data Re-Use
Formal publishing of well-documented research data sets for re-use must be recognized as scholarly work
Data needs a permanent, digital location (DOI) prior to journal article, not just a URL
Formally cite data in your reference list of your papers using DOI, citation language as indicated in DataCite


RAPID
CONVERGE

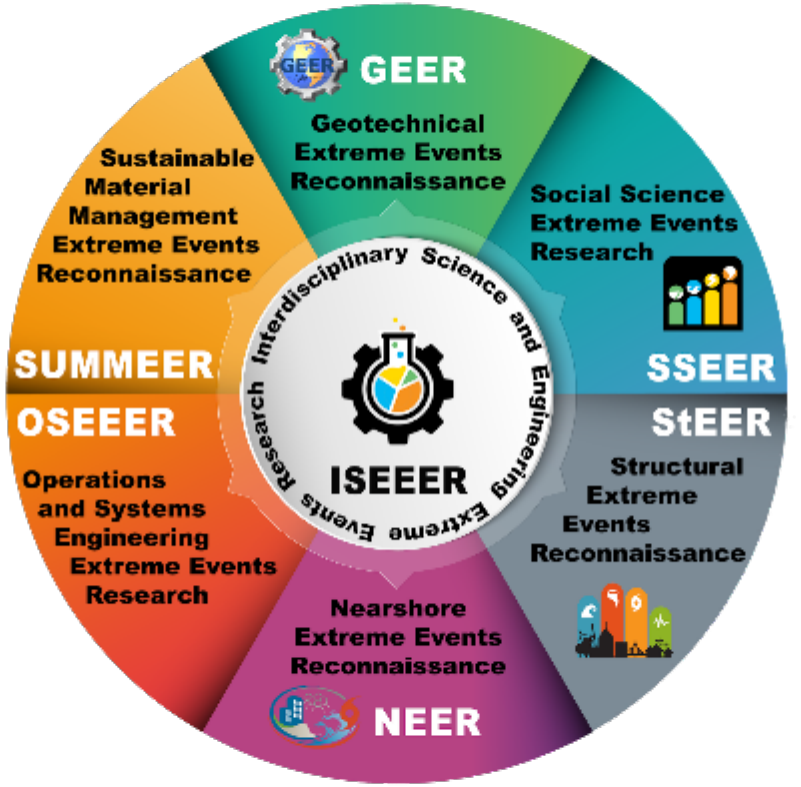
CONVERGE Leadership Corps

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)



converge.colorado.edu/research-networks


GEER
Geotechnical Extreme Events Reconnaissance
Social Science Extreme Events Research
SSEER
StEER
Structural Extreme Events Reconnaissance
NEER
Nearshore Extreme Events Reconnaissance
OSEEER
Operations and Systems Engineering Extreme Events Research
SUMMEER
Sustainable Material Management Extreme Events Reconnaissance
Interdisciplinary Science and Engineering Extreme Events Research
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	- 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	- Site characterization (e.g., pre-incident debris plan) - Disaster material characteristics and conditions, data related to debris management operation, etc.
Website	-

NSF Award #2014330

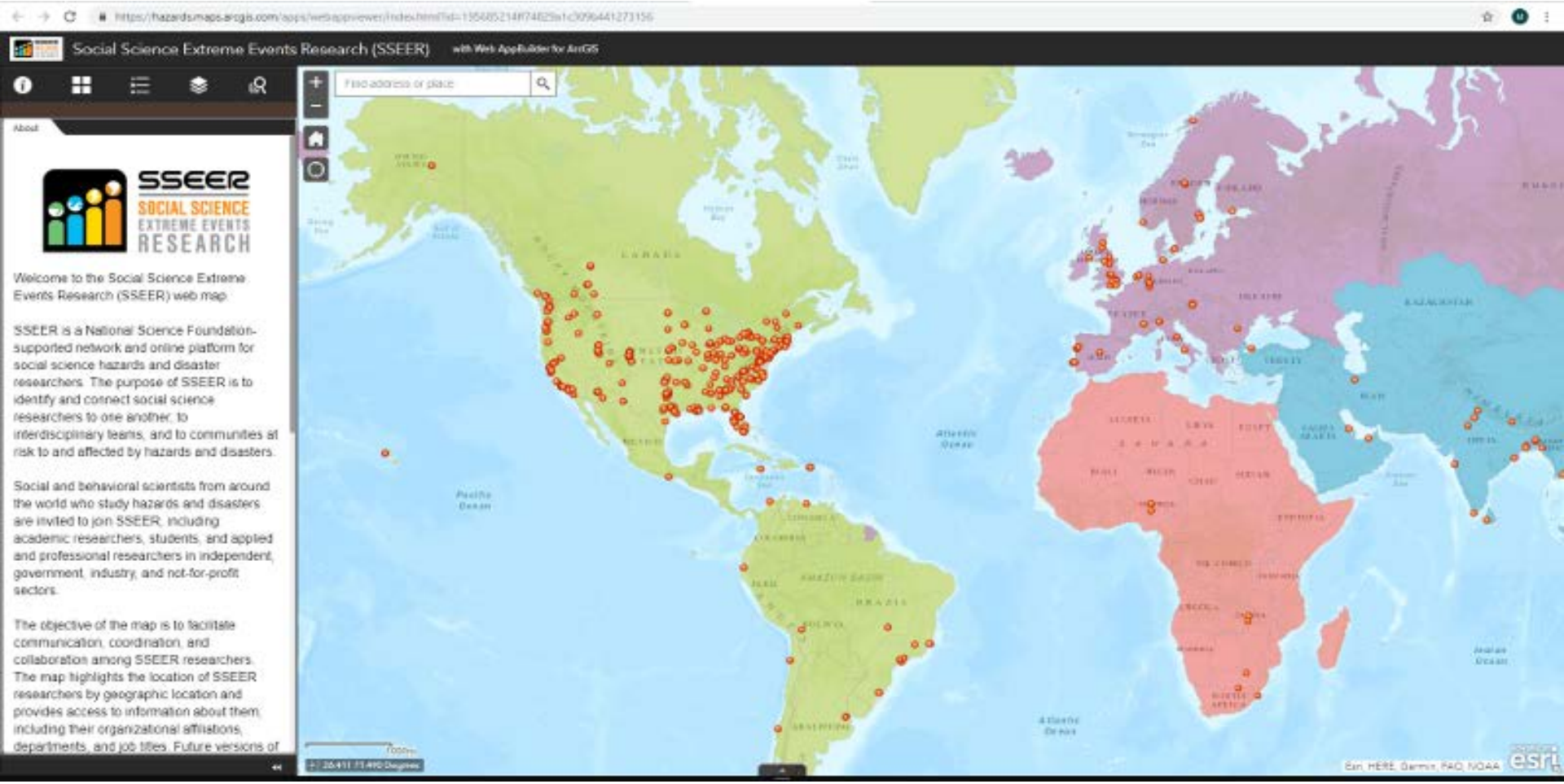
Juyeong Choi, PI

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



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

ISEEER
INTERDISCIPLINARY SCIENCE & 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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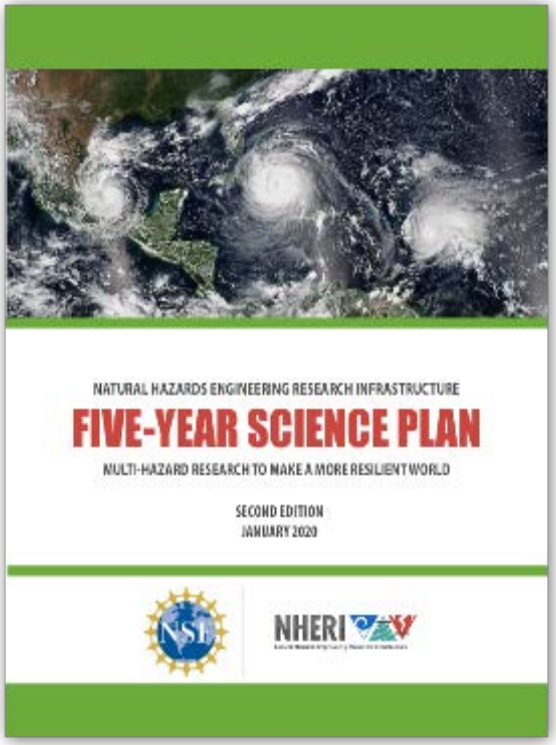
Interdisciplinary Science and Engineering Extreme Events Research
ISEEER

NSF's Facilities/Programs

NHERI 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/

NCO NHERI
Network Coordination Office



NSF Award #1612144

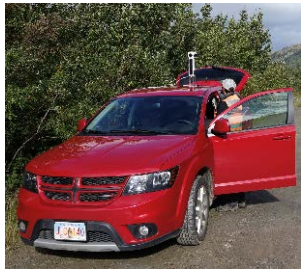
Julio Ramirez, PI

RAPID NHERI

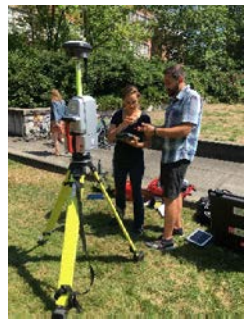
Natural Hazards Reconnaissance









- 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

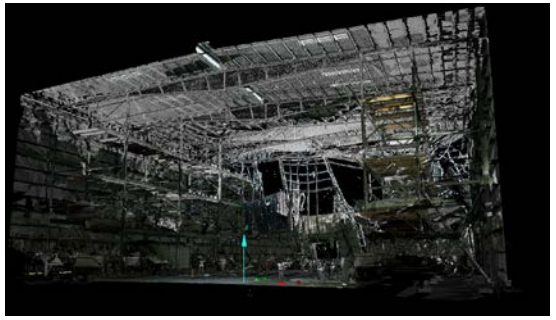
NSF Award #1611820

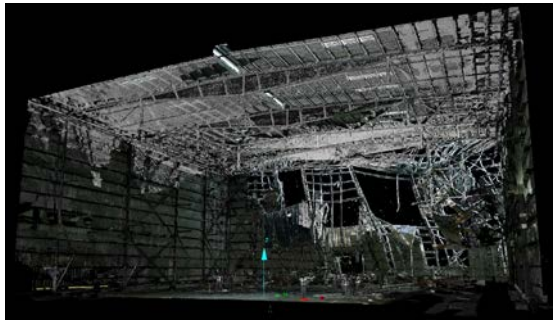
Joseph Wartman, PI

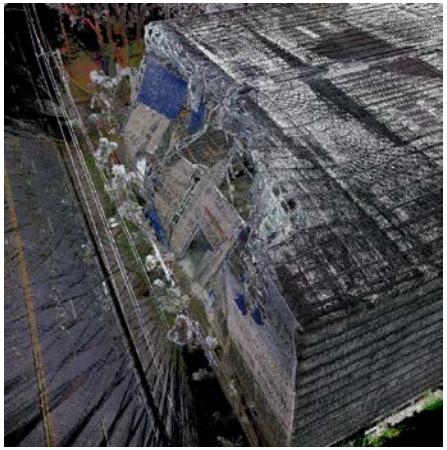
RAPID NHERI
Natural Hazards Reconnaissance

Example Data Products

2018 Hokkaido, Japan





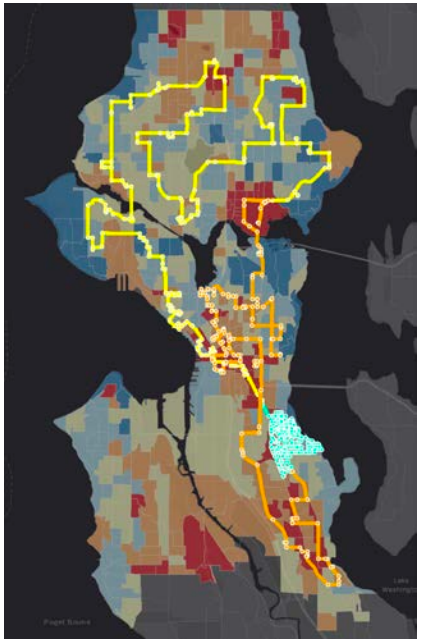


2018 Hurricane Michael

RAPID NHERI
Natural Hazards Reconnaissance

Current Project:

Covid-19 Seattle Street View Campaign



NSF RAPID Award #2031119

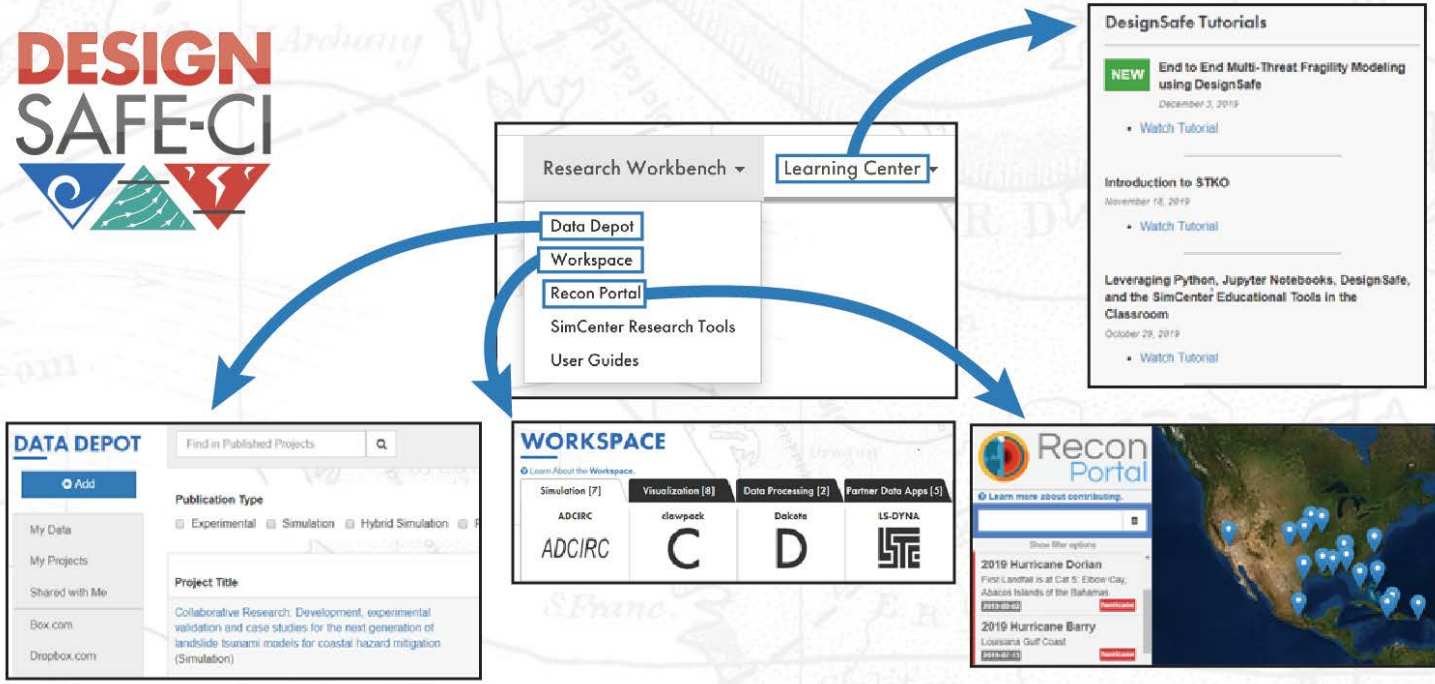
DESIGNSAFE-CI

- 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

DESIGN SAFE-CI

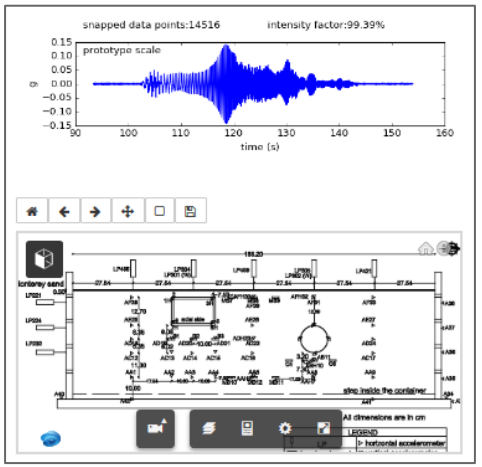


Citable, archived datasets

Cloud-based tools for analysis

Potree Viewer

Jupyter Notebooks



NSF Award #1520817

CONVERGE
NHERI

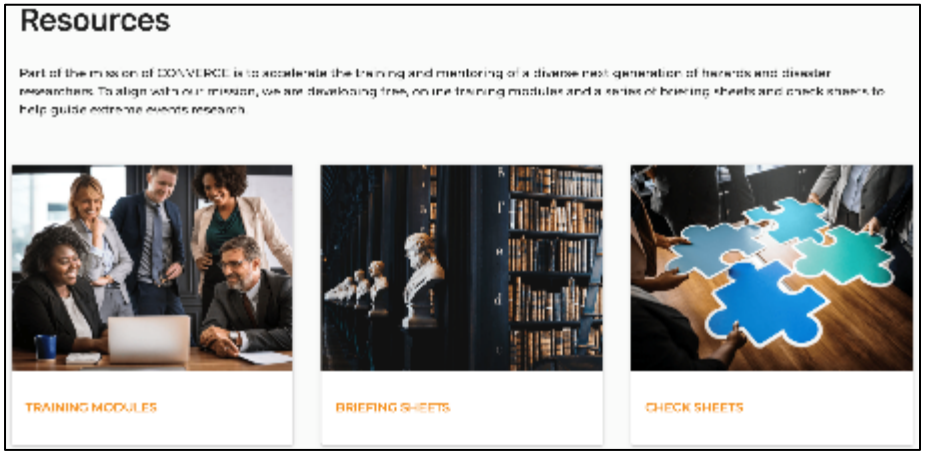
Established: 2018

converge.colorado.edu

Identifying, Connecting, and Coordinating Researchers

Encouraging the Ethical Conduct of Research

Promoting Convergence Research

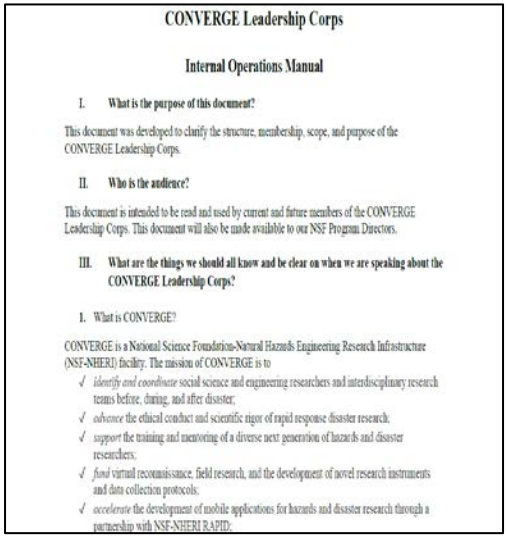


NSF Award #1841338

Accomplishments

Best Practices

Communications



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?

1. What is CONVERGE?

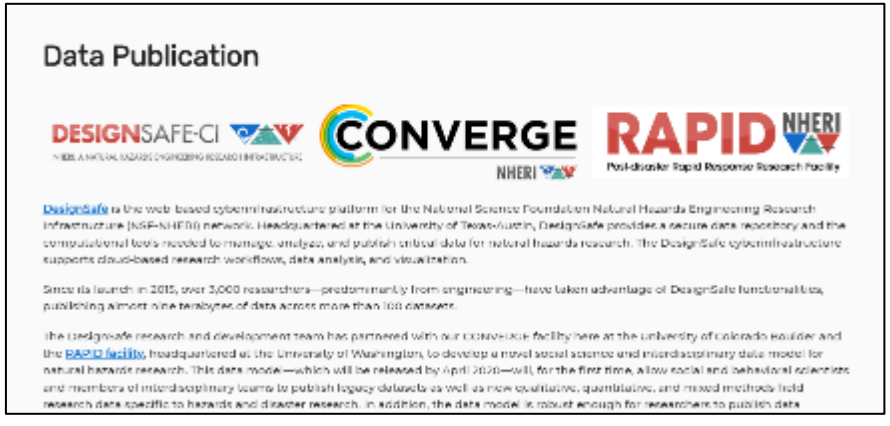
CONVERGE is a National Science Foundation-Natural Hazards Engineering Research Infrastructure (NSF-NHERI) facility. The mission of CONVERGE is to

- *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;

Data Collection

Training and Mentoring

Data Publication



Data Publication

DESIGNSAFE-CI

CONVERGE NHERI

RAPID NHERI
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-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 workflows, 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 CONVERGE 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?