NHERI- Network Independent Advisory Committee (NIAC)
WEBEX Virtual Meeting Topic: NIAC 2nd Meeting in Year-4
Date/Time: June 29, 2020 from 1:00 to 4:00 PM Central

Webex Details

Title: NIAC Meeting Y-4
Location: https://purdue.webex.com/purdue/j.php?MTID=mad10d137130c013585d0bb3425d57e23
When: Monday, June 29, 2020 2:00 PM – 6:00 PM EDT

Organizer: Cisco Webex <messenger@webex.com>

Description: JOIN WEBEX MEETING https://purdue.webex.com/purdue/j.php?MTID=mad10d137130c013585d0bb3425d57e23 Meeting number (access code): 120 546 2674 Meeting password: kRYhF6tg2A7 JOIN BY PHONE +1-855-282-6330 US TOLL FREE Tap here to call (mobile phones only, hosts not supported): tel:%2B1-855-282-6330,,*01*1205462674%23%23*01* +1-415-655-0003 US TOLL Tap here to call (mobile phones only, hosts not supported): tel:%2B1-415-655-0003,,*01*1205462674%23%23*01* Toll-free dialing restrictions: https://www.webex.com/pdf/tollfree_restrictions.pdf JOIN FROM A VIDEO SYSTEM OR APPLICATION Dial sip:1205462674@purdue.webex.com You can also dial 173.243.2.68 and enter your meeting number. Join using Microsoft Lync or Microsoft Skype for Business Dial sip:1205462674.purdue@lync.webex.com If you are a host, click here to view host information: https://purdue.webex.com/purdue/j.php?MTID=m80d296a534bb212c11def118e0fba2b8 Can't join the meeting? Contact support here: https://purdue.webex.com/purdue/mc IMPORTANT NOTICE: Please note that this Webex service allows audio and other information sent during the session to be recorded, which may be discoverable in a legal matter. You should inform all meeting attendees prior to recording if you intend to record the meeting.

Minutes

1. (5') Welcome, Attendance and Review of action items and approval of the previously distributed Minutes of the 3-24-20 Meeting (Bill Hansmire)
   Attendance: Lesley Ewing, Bill Hansmire (chair), Catherine Petroff, John van de Lindt, and Peter Vickery (NIAC); Julio Ramirez and JoAnn Browning (NCO).

   Minutes from 3/24 meeting were approved as previously distributed.

2. (30') NCO Update (Julio Ramirez, and JoAnn Browning)(Slides will be distributed prior to the meeting)
   The NCO provided an update on the NHERI activities including: (i) governance; (ii) dissemination of NHERI impact; (iii) international partnerships; (iv) scheduling facilities; (v) metrics; (vi) education including REU program and Summer Institute; (vii) technology transfer committee; and (viii) communications. The update slides are attached to these minutes. During the update there were several observations made by the NIAC and resulting action items. These were:
   a. Catherine Petroff and Bill Hansmire commented on the Technology Transfer Committee (TTC) one-pager discussed during the NHERI Virtual Meeting for early Career Researchers, and asked for a copy. **Action Item:** One pager from the TTC will be attached to the Minutes.
   b. Lesley Ewing commented on the success in enhancing diversity in the educational programs of NHERI such as the REU, and asked about the reason for such success. JoAnn Browning shared the strategies during the selection process, actively recruiting from minority serving institutions and working with the facilities to provide mentoring. Also noted that the presentations during the NHERI virtual meeting were being recorded and asked if these would be made available. JoAnn indicated that yes and that the presenters had given permission to do so. She indicated that the raw recordings would be made available via DesignSafe-ci in a segmented way to facilitate viewing.
   c. Catherine Petroff noted that the NIAC had provided feedback on the NHERI metrics and asked if this input had been reflected in the new metrics of NHERI. For instance, she noted

demographics of the user such as how many were early career, and from outside the facilities they were using. Julio noted that answering, who the users of NHERI were, was one of the goals of the metrics. **Action Item:** The latest metrics document, currently being implemented in the facilities, will be made available with these Minutes.

3. (10') NHERI Status during COVID-19 (Julio Ramirez)
   Julio indicated that the facilities had closed for external operations as shared-use facilities in mid-March and were now carefully re-opening for research, but external researchers were still not allowed. During the shutdown laboratories continued remote operations. SimCenter, NCO and DesignSafe-CI have continued to operate remotely.

4. NIAC Plans for Year 5 (All)
   a. Membership Update
      NIAC has filled one of the vacancies and is currently in the process of filling the second one.

   b. Priorities
      Continue to advise the NCO and engage with the TTC. **Action Item:** Julio will provide the link to the TTC page to facilitate access to the report from the November 2019 of the TTC with the researches. Here is the link to the report:
      https://www.designsafe-ci.org/community/ttc/
      Lesley and Bill noted that another important aspect was disseminating the impact of NHERI at professional meetings such as the ASCE Lifelines during the 50th year anniversary of the San Fernando Earthquake, Sustainable Infrastructure in Dec. 2021 and similar.
      Lesley also inquired about the role of NHERI in supporting early warning systems.
      John noted that in the next 5-years of NHERI it would be important to continue exploring possible partnerships with Western Ontario and the Ports and Airport Authority in Japan, in addition to the successful ones currently in NHERI.

   c. Annual Report to NCO and NSF
      NIAC will hold a telecom to discuss the report. The target is to submit during Fall of 2020.

   d. Activities- Meeting schedule and Agenda Items
      Next meeting will be scheduled for sometime in November.

5. (5') New Business
   None

6. Adjourn
   Meeting adjourned at 4:40 PM EDT.

GUIDANCE FOR EARLY CAREER RESEARCHERS

NHERI Natural Hazards Engineering Research Infrastructure

Move Your Research Results Into Practice

Are you a researcher itching to develop and implement the means, methods and policies for reducing the adverse effects of natural hazards?

Will your research results have a novel practical application in engineering design or analysis?

Are you so excited about your potential research results that you are driven to inform others who could benefit?

If your answers are YES,
consider connecting with NHERI's
TECHNOLOGY TRANSFER COMMITTEE

The **TECHNOLOGY TRANSFER COMMITTEE** is a volunteer group of 20 individuals, mostly engineers, experienced in design and the complexities of technology transfer.

The **TECHNOLOGY TRANSFER COMMITTEE** **facilitates and speeds the transfer of research results into active engineering practice.**

REQUEST A CONSULTATION

Researchers can r**equest a consultation** with the **TECHNOLOGY TRANSFER COMMITTEE** at ttc-inquiry@designsafe-ci.org.
Be sure to indicate the hazard involved.

REQUEST THE DOCUMENT: *"Mechanisms for Implementation of NHERI Results"*

The **TECHNOLOGY TRANSFER COMMITTEE** has published a white paper describing technology transfer mechanisms for improving the performance of civil infrastructure during and after natural hazard events.

Obtain your copy of *"Mechanisms for Implementation of NHERI Results"* on the Tech Transfer Committee page on DesignSafe: designsafe-ci.org/community/ttc/.

Topics covered include:

- Common methods for implementing research results.
- Steps to make research readily implementable in the updating of building codes and standards.
- Overview of existing building codes and standards such as the IBC, IRC and the ASCE/SEI 7 and ASCE/SEI 41 standards for seismic design.
- Overview of research implementation and tech transfer programs of major federal organizations such as FEMA, NIST, ATC and BSSC.
- Information on privately funded entities and tech transfer activities conducted by early adopters.
- Methods of implementation when proprietary materials, design methods, or construction methods are involved.
- Presentations at professional associations, cross-disciplinary meetings and webinars with a question-and-answer session.

Appendix 1

This document attempts to define a set of reportable metrics for utilization that NHERI equipment facilities can report uniformly. The metrics are meant to both reflect level of engagement (roughly reflective of science impact) and operating efficiency.

Background:

Within our cooperative agreements, NSF defines utilization as actual days of equipment utilization by NSF supported projects / total planned days of utilization as included in the approved final Annual Work Plan, including days planned for routine equipment maintenance and calibration.

It follows, then, that NSF has set forth the following definitions:

Throughput = days of equipment utilization by NSF supported projects

Capacity = planned days of utilization as included in the approved final annual work plan, including days planned for routing equipment maintenance and calibration.

There exists a fundamental conflict, however, in enforcing a single capacity metric across the multiple equipment facilities because each facility has a unique business model. Capacity metrics must be internally consistent with the local business model, and, in general, equipment facilities do not currently base their business models on days of utilization. Expressing capacity in terms of days across all sites would require either an abstract mapping of capacity expressed in local terms to globally defined utilization days, or would require a complete restructuring of each facility's business model to build capacity around days. The former requires high level interpretation when reporting the metric, making it non intuitive to evaluate. The latter is not recommended because expressing funded capacity in terms of utilization days puts the site in conflict with the user and requires considerable effort to implement. That is, days of utilization by the user are inversely proportional the level of resources dedicated to the project by the operator – the project goes faster when the site incurs more cost. Furthermore, adopting new business models across the sites will incur major costs at each site (through extensive staff effort) and is subject to local review and acceptance by campus business units.

Proposed solution:

Adopt a uniform set of metrics to demonstrate throughput at the equipment facilities that can be used to reflect level of engagement, or research impact. It is suggested to use metrics defined using days of use, similar to the structure reported by the Academic Research Fleet. For example, a large number of science days would intuitively reflect that the equipment facility is being commonly used in science applications and would be a useful evaluation. The metric could not be used to demonstrate utilization as a percentage of capacity, and would not reflect the efficiency of use.

Adopt a uniform practice of reporting utilization as throughput divided by capacity using local definitions of throughput and capacity. A uniform set of categories may be possible, so, for example, equipment facilities could report X% supporting the science of project A, Y% in maintenance, Z% administration, etc. The utilization percentage would be comparable across sites by category, but the raw throughput and capacity numbers likely would not be.

A strawdog implementation of the reporting solution is given below.

An example reporting structure:

The University-National Oceanographic Laboratory System has the following list of Activity/Day types (https://strs.unols.org/Public/diu_faq_view.aspx?short=DayTypesDefinitions):

- **At Sea for Science Day:** All days at sea incident to the scientific mission.
- **Available for Service Day:** Ship is mechanically and administratively prepared for at sea operations but not currently scheduled for any mission or project. Routine outfitting and general upkeep can occur during these days.

- **Inspection Day:** A day in which the ship is undergoing an inspection by Navy, INSURV, NSF, USCG, ABS, other regulatory body, or an insurance company.
- **Outreach Day:** A day in which the ship is primarily devoted to conducting an open house or other public outreach event. Include days spent mobilizing and demobilizing for the event.
- **Standby Day:** Days in port for purposes of crew rest (e.g.weekends if that fits your ship) or weather/environmental reasons.
- **Overhaul or Repair Day:** Planned shipyard overhaul or emergency repairs. Days undergoing overhauls, dry-docking, or other scheduled or unscheduled repairs during which the ship is not available for service. Also would include at sea shakedown of ship's overhauled equipment.
- **General Upkeep and Outfitting Day:** Days in port for purposes of fitting out, general upkeep, and routine outfitting and minor pierside maintenance, which does not take the vessel out of service.
- **Out of Service Day:** Days in which a ship is laid up out of service for an extended period for reasons of economy, unemployment, or unfitness for service.
- **Transit Day:** At-sea days primarily for the purpose of going from one port to another or to/from a port and an area of research.

Days are exclusive such that the major category of activity each day is reported for that day. The fleet's business model is structured around days of use such that annual work plan capacity and utilization can be expressed with activity days.

Strawdog implementation – throughput

Goals – produce an easy to track metric that:

- can be captured by operations staff during their normal workflow
- does not require additional high-level interpretation before reporting
- is intuitively obvious to a reviewer
- provides quantifiable data reflective of the level of engagement of the equipment facility by science users

Data gathering:

Data should be tracked on the use of the facility via components at the discretion of the facility, using as few of components as reasonable to accurately reflect engagement of the facility. For example, the academic fleet reports at the individual ship level, not the fleet level, and not at the individual resource level. At UC Davis, for example, they plan to report at the facility level. They could easily track at the centrifuge level, logging use of the 1m and 9m centrifuges separately. These machines are used independently and often in parallel. But, they feel independent tracking of these machines does not accurately reflect staff engagement for the facility. For example, in the spring they began a maintenance cycle on the 1m centrifuge that made the machine unavailable for use. This summer they have chosen to leave the 1m machine idle as the staff have been saturated supporting multiple projects working simultaneously on the 9m centrifuge, and there has not been an immediate project need for the 1m centrifuge. Every day of the summer has been a science day for the staff. It would be inaccurate to report 90 Science Days for the 9m centrifuge and 90 repair days for the 1m centrifuge.

The following data should be collected on a daily basis:

Projects active on site, or staff actively engaged in project-specific research support: Typically means students are on site, actively and significantly using shared resources within the lab. It

may also mean facility staff are actively working on the project science independent of project personnel (e.g., RAPID facility personnel independently process data from the field following missions). Minor support of research, such as remote planning meetings, would not count, and students simply using office space would not count. The goal is to capture days of significant engagement. The daily log should track which projects are active each day.
Tours and events: Maintain a daily log of tours and events that significantly engage the equipment facility. This should include events hosted at the site (common) as well as events where site personnel significantly participate in off-site outreach events (less common).
Inspections: Any day where an external entity performs an inspection on site. E.g. site visits, BSR, EH&S safety inspection.
Repairs: Make note of any day where the tracked resource is unavailable to users due to planned overhaul or emergency repairs. Tracking at the facility level might result in zero repair days even when major equipment is taken offline if users continue to work with other facility resources.
Maintenance: If you are tracking a the facility level it can be assumed that every work day includes maintenance activities. If you are tracking at the individual equipment level you can log that maintenance work was being performed.

Reporting:

The following event logs should be reported as totals to reflect total engagement. Days are not exclusive, five projects active on one day will be reported as five project days.
Project Days:
NSF Project Days
Non NSF Project Days
Tours and event Days
The event logs should be processed according to calendar days to generate the following calendar day events. Reported days are exclusive – each calendar day can be represented only once in the tally. The sum of these days should add to 365 (or 366) for the year.

Strawdog implementation – throughput

TBD – but basically each site uses their local business model / work breakdown structure to calculate utilization as a percentage of throughput divided by capacity. Common categories should be adopted.

Other reporting metrics:

In addition to the proposed utilization metrics outlined above, we propose to gather the following metrics that will show the network wide user base and the projects that they are engaged in. We are following the similar model to the research ship fleet, tracking users, their characteristics, and the projects they are involved in so that further cross-examination and analysis of our user base can be done as needed.

USER

EF Lab User (as opposed to a data user, etc.): someone who works (or has worked) in the lab (or supervises work in the lab – ie remote PI), who is using physical resources on site or remote. This user has characteristics – (ORCID) Name, role (grad student, postdoc, PI, etc.), project, demographic info, etc.

For example, we do not count technicians, analysts, etc. as users.

Cross reference projects to enumerate NSF user, non NSF user, repeat user.

Quarterly- report total NSF users for the award, and new NSF users for that quarter.
Optional – report non-NSF users for the award and new non-NSF users for that quarter

Sponsor Awards

Number of awards from different sponsors, distinguished by funding agency or source.

PROJECT

A project is a coordinated research arc (or a single RAPID deployment), run by a team of users. xEER deployments are counted individually.

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Agenda

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2. (30') NCO Update (Julio Ramirez, and JoAnn Browning)(Slides will be distributed prior to the meeting)

3. (10') NHERI Status during COVID-19 (Julio Ramirez)

4. NIAC Plans for Year 5 (All)
    a. Membership Update
    b. Priorities
    c. Annual Report to NCO and NSF
    d. Activities- Meeting schedule and Agenda Items

5. (5') New Business

6. Adjourn

Natural Hazards Engineering Research Infrastructure

Network Coordination Office

NHERI-NCO
NHERI-Network Coordination Office
CMMI-1612144

NIAC Update

Year 4 Activities

June 29, 2020

Teleconference 2:00 PM EDT (1:00 PM CDT)

NHERI Natural Hazards Engineering Research Infrastructure

NSF's Facilities/Programs

PURDUE UNIVERSITY
Network Coordination Office
NSF Award #1612144

UNIVERSITY OF COLORADO BOULDER
CONVERGE
Social science/interdisciplinary resources
NSF Award # #1841338

UC BERKELEY
SimCenter
Computational Simulation
NSF Award #1612843

UNIVERSITY OF WASHINGTON
RAPID
Post-disaster Research
NSF Award #1611820

UNIVERSITY OF TEXAS, AUSTIN
DesignSafe
Community Cyberinfrastructure
NSF Award #1520817

OREGON STATE UNIVERSITY
O.H. Hinsdale Wave
Research Laboratory
Wave Basin and Flume
NSF Award #1519679

LEHIGH UNIVERSITY
Large-Scale Multi-Directional
Hybrid Simulation Testing
NSF Award #1520765

UNIVERSITY OF TEXAS, AUSTIN
Mobile Field Shakers
NSF Award #1520808

UNIVERSITY OF FLORIDA
Wind Experimental Facility
Wind Simulation
NSF Award #1520843

UC DAVIS
Geotechnical Centrifuges
NSF Award #1520581

FLORIDA INTERNATIONAL UNIVERSITY
Wall of Wind International Hurricane
Research Center
Wind Simulation
NSF Award #1520853

UC SAN DIEGO
Large High-Performance Outdoor Shake Table
NSF Award #1520904

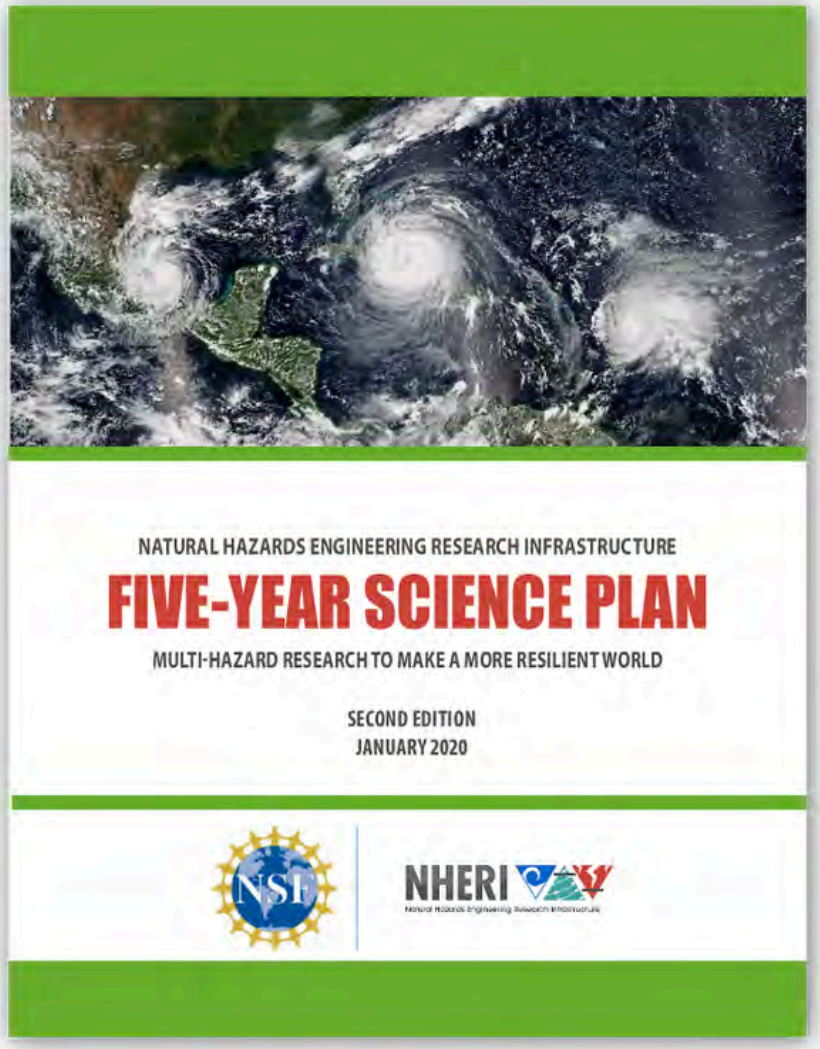
NCO NHERI
Network Coordination Office

NCO Strategic Goals in Year 4

- **Community Leadership**
  - Fair and Effective Governance
  - Science Plan Dissemination*
  - Foster International Partnerships
  - Accelerate Transfer of Research to Practice
  - Organize NHERI Researchers Meeting
- **Coordination of NHERI Components**
  - Clear and Transparent Access to laboratories, Protocols with On Time Scheduling
  - Effective Training and Dissemination of Research Capabilities
  - Work with EERs through CONVERGE
- **Education and Community Outreach**

Storm surge, Hurricane Fran, North Carolina 1996

2nd Ed. of the 5-Year NHERI Science Plan is Available!



NHERI Five-Year Science Plan: 2nd Edition (January 2020)

NCO NHERI
Network Coordination Office

NCO and the NHERI Council

- Implement NHERI-wide metrics implement in the last quarter of Y4 ONGOING
- Disseminate the impact of NHERI while continuing to build a community of satisfied multi-hazard users working on the *NHERI Impact* publication ONGOING
- Execution of the Y3 User Satisfaction Survey ✅
- Published the second edition of the 5-Year NHERI Science Plan [(January 2020) https://www.designsafe-ci.org/facilities/nco/science-plan/] ✅
- Planning the NHERI researchers meeting for 2021 ONGOING
- Maintain community informed about NHERI status during COVID-19 (DesignSafe-CI.org) ✅

ECO Committee – Strategy & Function

Karina Vielma
UTSA, Chair

Adda Athanasopoulos-Zekkos (UC Berkeley)
& Mohammad Khosravi (Montana State)
User Forum

Arindam Chowdhury, Amal Elsaday, Carolyn Roberson
Florida International University

Chad Kusko
Lehigh University

Pedro Lomonaco & Dan Cox
Oregon State University

Matt Schoettler
UC Berkeley

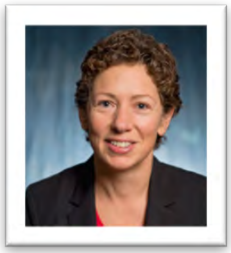
Mary Carrillo, Srikanth Madabhushi
UC Davis

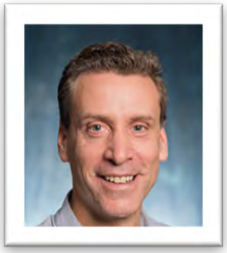
Lelli Van Den Einde & Joel Conte
UC San Diego

Kurtis Gurley
University of Florida

Jamie Ellen Padgett
(Rice)
UT Austin-CI

Patricia Clayton
UT Austin
Shaker





Laura Lowes & Joseph Wartman
University of Washington

NCO NHERI
Network Coordination Office

Education & Community Outreach

Goal: Plan & drive activities to engage and expand the NHERI community.

Summer Institute

- 23% of all participants received NSF funding as PI or co-PI (*n*=60)
  - 18% of participants received funding as PI
  - Average funding/grant $263K
- 18% of 2017-2018 participants received funding after attending
- 2 career awards (after attending)
- 22% of post-docs and Ph.D. students hold tenure-track positions
- 44% of participants were post-docs or PhD students

REU

All respondents remain in STEM majors

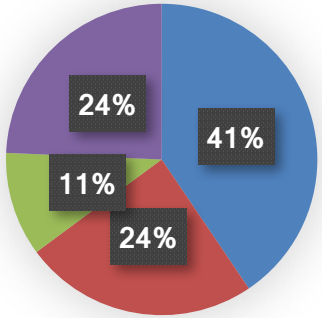
- Over 40% of respondents conducted research post-REU
- 67% graduated (with STEM degrees) & 22% still in school
- 7% enrolled in PhD programs
- 37% enrolled in graduate school

NCO NHERI
Network Coordination Office

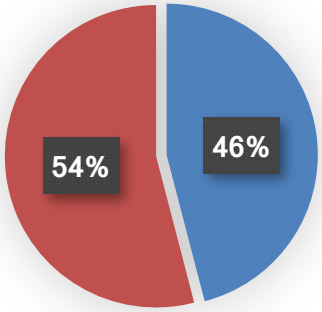
Education & Community Outreach

Goal: Plan & drive activities to engage and expand the NHERI community.

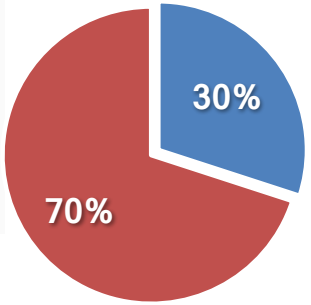
Summer Institute



White
Asian

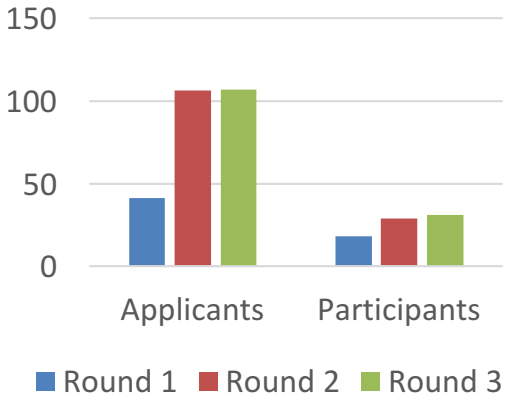


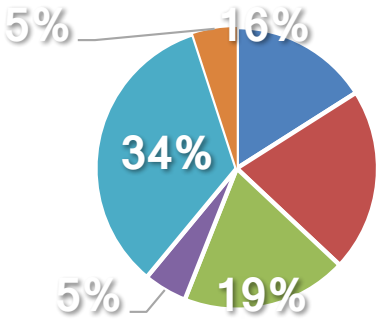
Female
Male



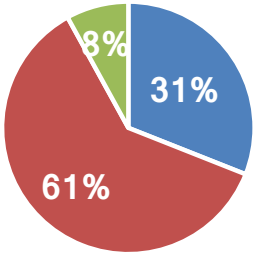
First Generation

REU





Hispanic
Black
Asian
Multiple Races
White
n/a



1st Generation
Not 1st Gen
Not available

NCO NHERI
Network Coordination Office

Education & Community Outreach

NHERI Virtual Workshop for Early Career Faculty Monday June 29, 2020	
Time	Description
Central Time **9:00-9:10am**	Welcome & NHERI Overview
	NHERI EXPERIMENTAL FACILITIES & RESEARCH PRESENTATIONS
9:10-9:25am	NHERI Wall of Wind @ Florida International University
9:30-9:45am	NHERI Wind Engineering Research Experimental Facility @ UF
9:45-10:00am	**Live Q&A**
10:05-10:20am	NHERI Lehigh: Experimental Facility with Large-scale Real-time Multi-Directional (RTMD) Hybrid Simulation Testing Capabilities
10:25-10:40am	NHERI@UTexas: Large Mobile Shakers for Natural Hazard Field Studies
10:45-11:00am	NHERI@UCSD: Large High Performance Outdoor Shake Table
11:00-11:15am	**Live Q&A**
11:20-11:35am	Center for Geotechnical Modeling (CGM) @ UC-Davis
11:40-11:55am	NHERI Experimental Facility for Coastal Hazards Engineering: Large Wave Flume and Directional Wave Basin at Oregon State University
12:00-12:15pm	NHERI CONVERGE, University of Colorado – Boulder
12:15-12:30pm	**Live Q&A**
12:35-12:50pm	NHERI RAPID Reconnaissance
12:55-1:10pm	NHERI DesignSafe Cyberinfrastructure
1:15-1:30pm	Computational Modeling and Simulation Center
1:30-1:45pm	**Live Q&A**
2:45-4:15pm	Grant Writing – Research 101
4:30-5:30pm	NSF Awardee Panel

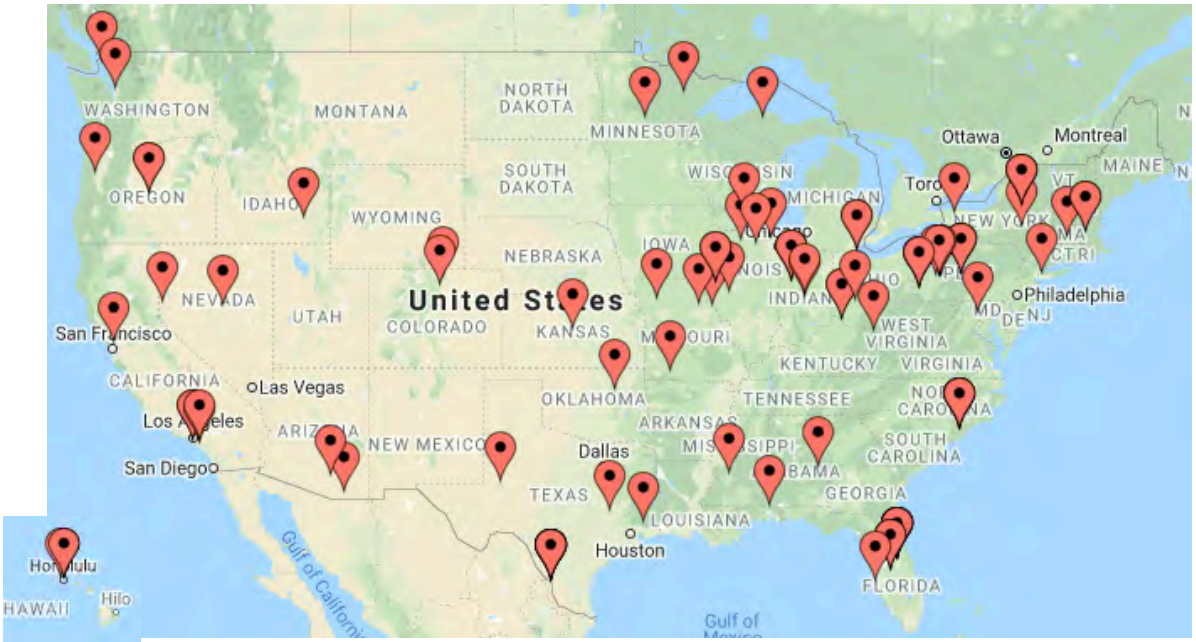
2020-21 Activities with COVID-19 Adjustments

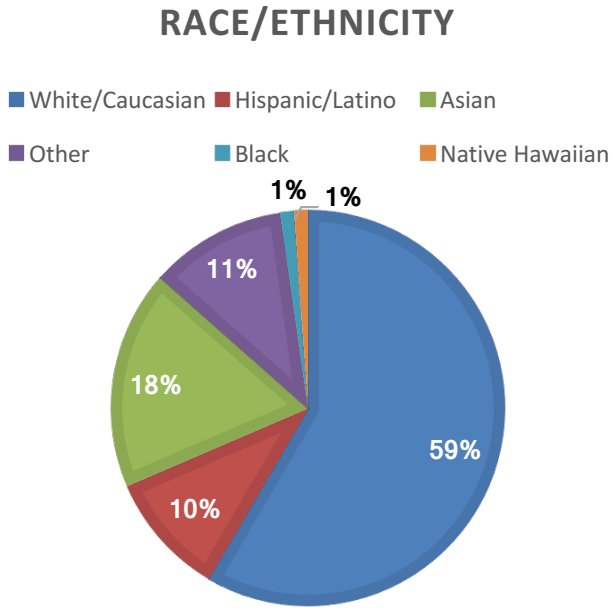
- Virtual Institute & Virtual Undergraduate Program
- Researcher's Meeting with Summer Institute
- Broadening Alumni Connections to Create Marketing/Branding Materials
- Intense Recruitment for Summer 2021

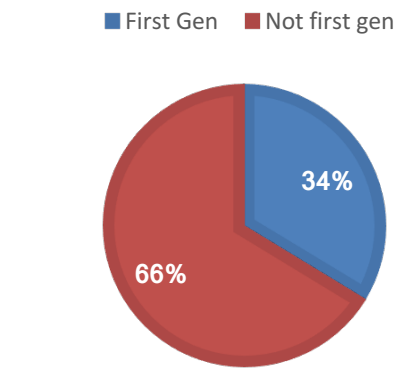
NCO NHERI
Network Coordination Office

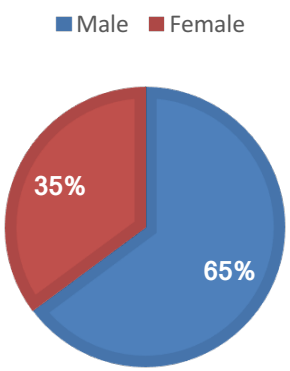
Virtual Institute Stats

- VIRTUAL INSTITUTE (115 Registrants)









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NCO NHERI
Network Coordination Office

Communications

Goal: Provide high quality context to our users, prospective users, and the general public via email lists, newsletters, news releases, the DesignSafe website and social media

Social Media

- As of June 2020, 750 **Facebook** followers, 2-5 additions per week with a consistent level of engagement (likes, clicks)
- 42% of our audience are in the 25 to 34 age group, college undergrads, graduate students and early career faculty.

- As of June 2020, 870 **Twitter** followers, gains of 5-10 new followers each week
- Audience is engineering faculty, graduate students and professionals (practicing engineers) representing NGOs and companies in natural hazards fields
- Natural Hazards Engineering News newsletter posted on Twitter attracts 5-10 new followers each week.

A focus on more content sharing between NHERI social media accounts;
UC Davis, Lehigh, and the SimCenter are good at promoting and sharing NHERI Facebook content

NCO NHERI
Network Coordination Office

Communications

CONVERGE Training Module on Human Subjects

News Release 18 June 2020

Publication of NCO Activities in

frontiers
in Built Environment

Acceptance June 2020

"The Network Coordination Office of NHERI (Natural Hazards Engineering Research Infrastructure)" for the *Earthquake Engineering section*

- News Release of the Virtual Summer Institute for Early Career Faculty
- Nat Haz. Engineering newsletter has **VERY HIGH** open rates of **50%** and **30%** click rates (open and click a link!)

A NHERI Impact Collection Book targeted for Aug 2020
(2-3 stories per NHERI participant)

NCO NHERI
Network Coordination Office

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