NHERI GSC
March General Meeting

2025

NHERI GSC
Graduate Student Council

Agenda

11:00-11:10 Welcome & Announcements

11:10-11:45 Dr. Ian Robertson

11:45-11:55 Questions

11:58-12:00 Wrap up

12:00-12:30 RSR Breakout Rooms

NHERI GSC
Graduate Student Council

Welcome!

EBRAHIM	HASHEMIFASAEI
Ahmed	Mohamed
Ola	El khatib
RICCARDO	NEGRI
Sunil	Bista
Aashish	Gautam
Komal	Gulati
Zhujun	Wang
Santosh	Ranabhat
Rodrigo	Leal
Nyla	Howell
Trinity	Johnson
Rehinatu	Usman
Sara	Stith
Jackie	Laundon
Brad	Bottoms
Carolyn	Cornelio
Piyali	Mishra
Caitlyn	Sutherlin
Robyn	Lea
Ali	Lesani
K. Nishanthi	Perera
Fuad	Hasan
Samjhana	Sharma
Aidin	Behroozi
Inam	Ullah
Araz	Hasheminezhad
Joahua	Adjei - Yeboah
Margaret	Miles
Daniel	Saavedra Maldonado
Docean	Park
Petros	Lazaridis
Martha	Karabini
Semachew	Kassa
Asmita	Adhikari
Abhay	Singh
ABBAS	FATHIAZAR
Nicolás	Bastias
Ernesto	Guades
Danial	Golbaz
Zihui	Ma
Alexandra	Schueller
Rosette	Niyirora

*Reach out to Daniel Yahya and Diako Abiass to learn how to get involved!

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Conference Opportunities!

Conference	Dates	Abstract
ACWE: 15th Americas Conference for Wind Engineering	May 19-22, 2025	Closed
AAG: 2025 (American Association of Geographers)	March 24-25, 2025	Closed
AGU24: American Geophysical Union	15-19 December 2025.	July 30, 2025
ASA: American Sociological Association	August 8-12, 2025	Closed
ASAV: American Sociological Association Virtual	January 30-31, 2025	Closed
ANNSIM: Annual Modeling & Simulation Conference	May 26th-29th, 2025	Closed
EMI: ASCE Engineering Mechanics Institute	May 27-30, 2025	Closed
SEI: ASCE Structure Congress	April 9-11, 2025	Closed
APPAM: Association for Public Policy Analysis & Management	Nov 13-15, 2025	April 23, 2025
IWSHM: International Workshop on Structural Health Monitoring	September 2025	Closed
NHERI Summer Institute	June 11-13, 2025	
SRA: Society of Risk Analysis Conference	December 7-11, 2025	Not announced yet
YCSEC: Young Coastal Scientist and Engineers Conference	April 3-4, 2025	Closed
Natural Hazards Workshop	July 13-16, 2025	Closed

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NHERI GSC
Graduate Student Council

MINI CONFERENCE

2025 MAY 16

FRIDAY
10 AM – 5 PM CT

- *Showcase Your Research*
- *Engage with Leading Research*
- *Inspiring Keynote Speaker*

Register today!

NHERI GSC
Graduate Student Council

Call for Abstracts

Submit your abstract for the NSF NHERI GSC Mini-Conference

Submission Deadline

Friday, March 28, 2025, at 11:59 PM CT

Abstract Requirements

Research question(s)

Data and method(s)

Theoretical or empirical motivations/framing

Expected findings from data analysis

Apply now!

NHERI
National Hazards Education Research Infrastructure

NSF

NHERI GSC
Graduate Student Council

Call for Reviewers

Review abstract for the NSF NHERI GSC Mini-Conference

Reviewer Requirements

Sign-up during registration for the Mini-Conference

Review up to 3 abstracts (max 500 words each)

Abstracts are anonymized for fairness

Submission Date

Reviews due by Friday, April 18, 2025

Apply now!

NHERI GSC Graduate Student Council

NHERI GSC Research Subcommittee Meetings!

Group Breakout Rooms!

Breakout Rooms (*30 Minutes*):

Organized by:

1. Simulation & Computational Methods Subcommittee:

Dr. Angeliki Gerontati will present on integrating structural modeling, computational techniques, and probabilistic methods for assessing the seismic risk of power plants.

Bijan Sayyafzadeh

RSR of Simulation

2. Geotechnical Engineering Subcommittee:

Dr. Zhan Weiwei will discuss landslide hazard assessment, machine learning applications, and multi-hazard resilient infrastructure design.

Mohamed Hassan

RSR of Geotechnical Engineering

3. Social Science Subcommittee:

Dr. Jennifer Johnson will provide insights on faculty job applications, interview expectations, and job talks based on her experience with R1 university hiring committees.

Erin Boyle

RSR of Social Science

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Speaker Introduction

Dr. Ian Robertson

Professor Emeritus of Structural Engineering at the University of Hawaii at Manoa

ianrob@hawaii.edu

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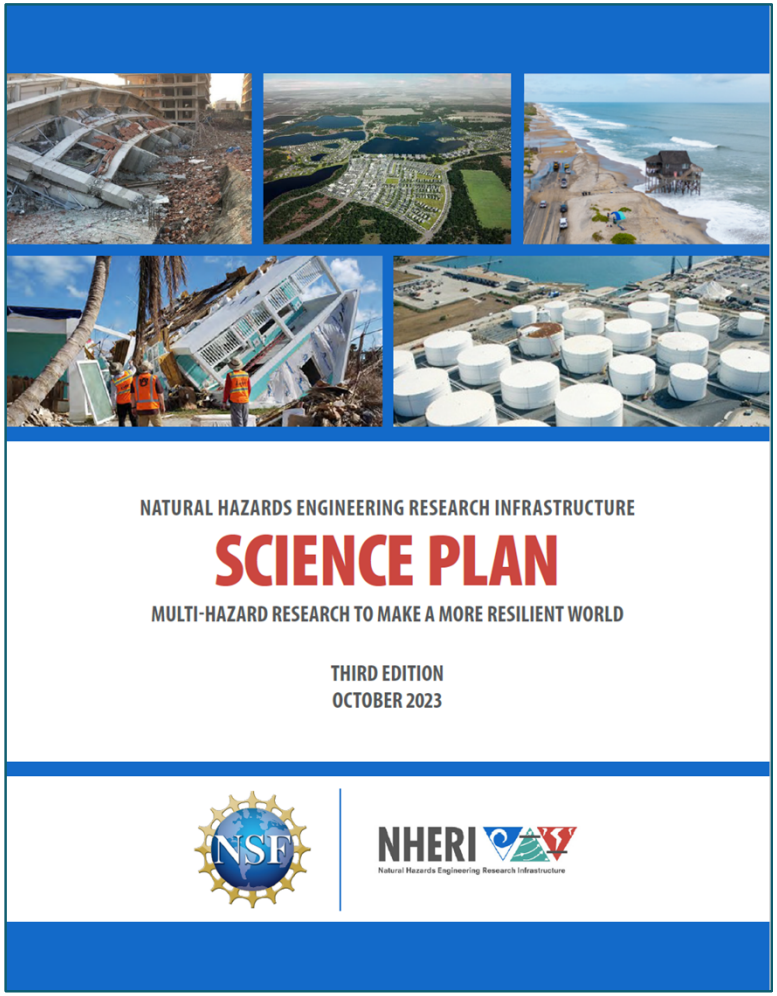
NHERI

Natural Hazards Engineering Research Infrastructure

CAREER PATH
AND
NHERI SCIENCE PLAN



Ian Robertson

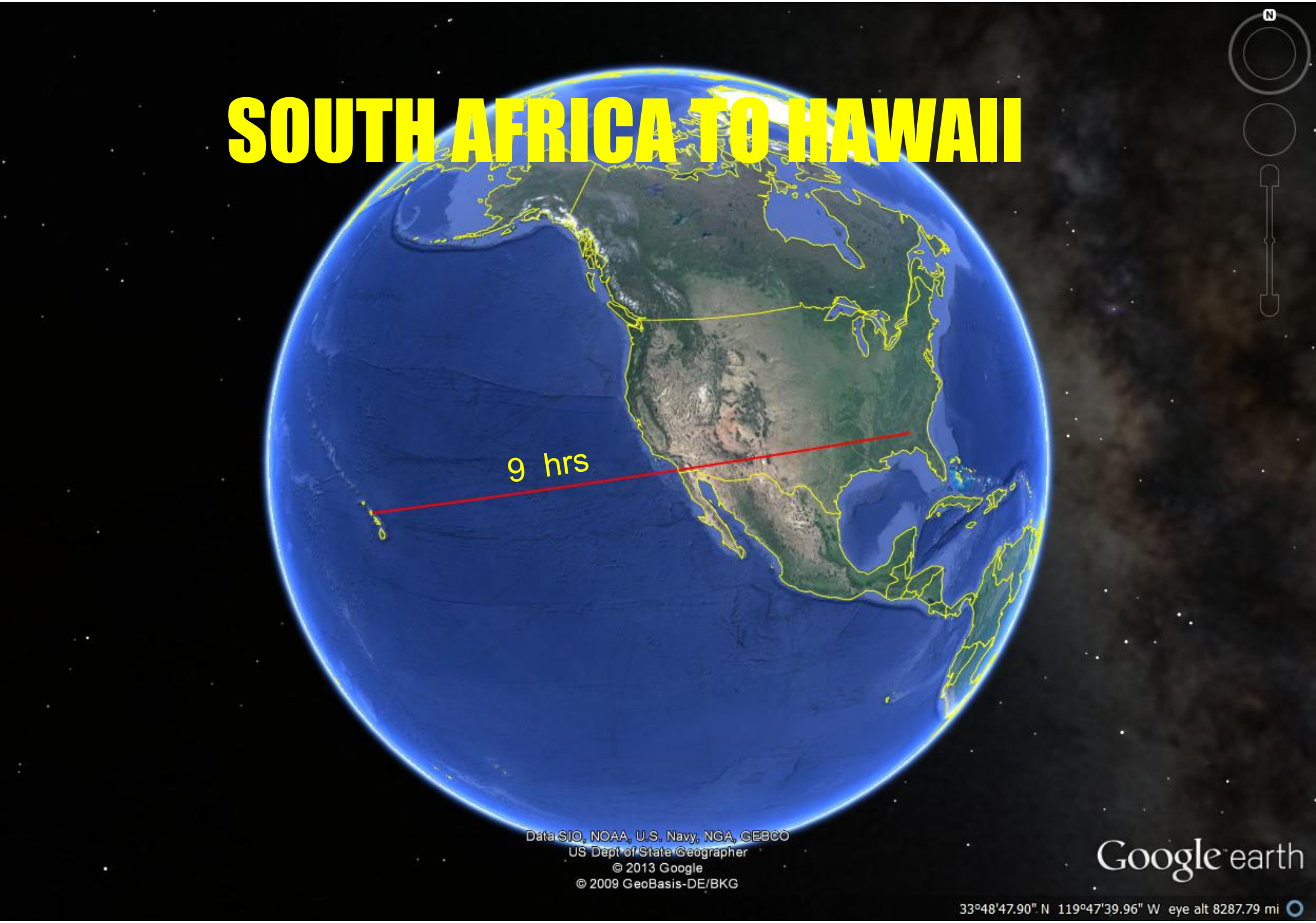
NHERI Science Plan Lead

GSC Meeting March 21, 2025

NHERI NCO

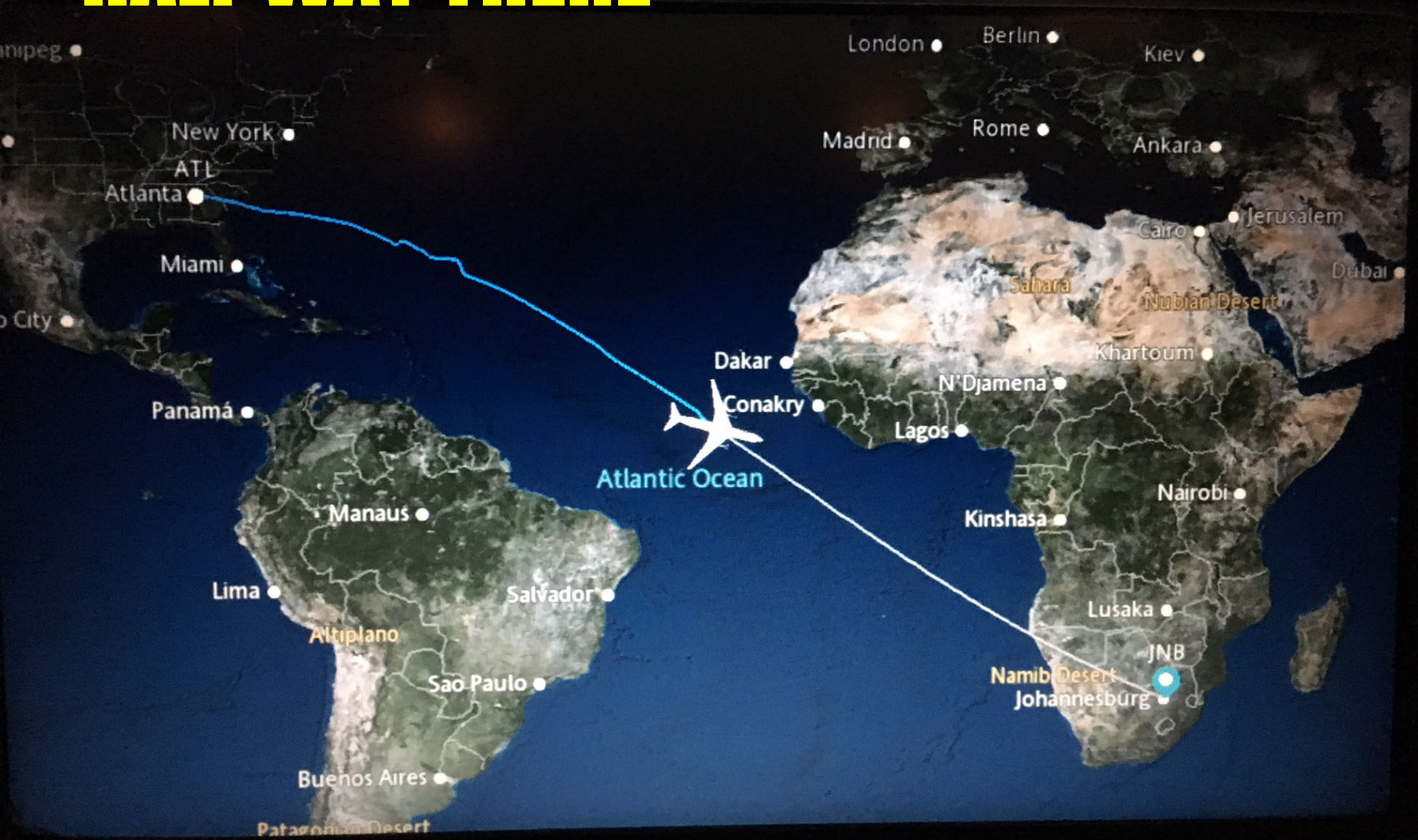
Network Coordination Office

SOUTH AFRICA TO HAWAII




16 hrs
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
US Dept of State Geographer
© 2013 Google
© 2009 GeoBasis-DE/BKG
Google earth
3°10'46.18" N 29°44'35.24" W eye alt 8301.14 mi

HALF WAY THERE



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DELTA
7103
FlightAware

AIRPLANE ENGINE

Atlanta to Johannesburg - 16 hour flight
3,000 rpm engine speed

$$revolutions = 16 \times 60 \times 3000 = 2{,}880{,}000 rev$$

- 2 hour layover to change passengers
- Return to Atlanta
- Repeat for years with monthly service

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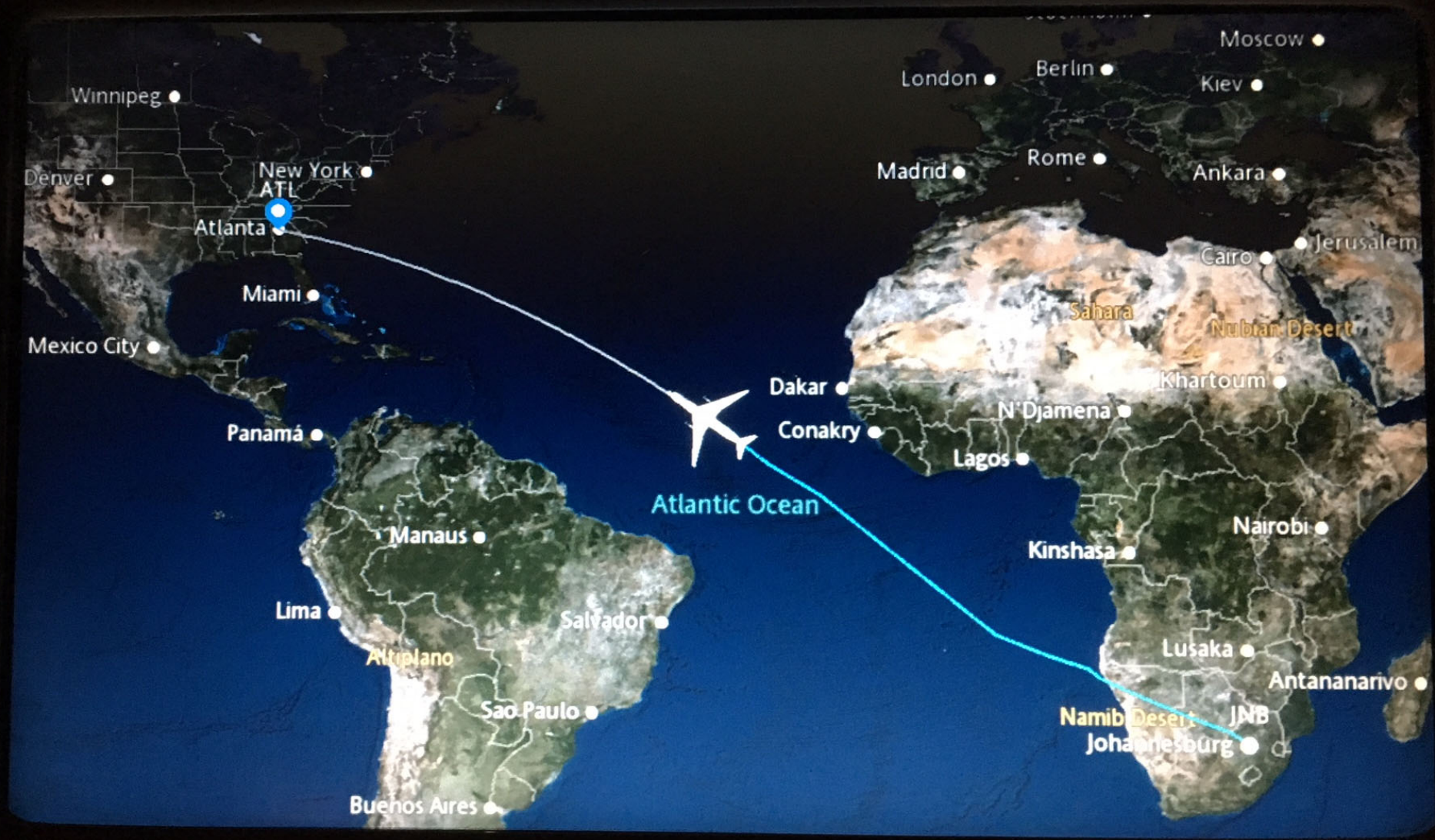
DELTA
The Spirit of ATLANTA

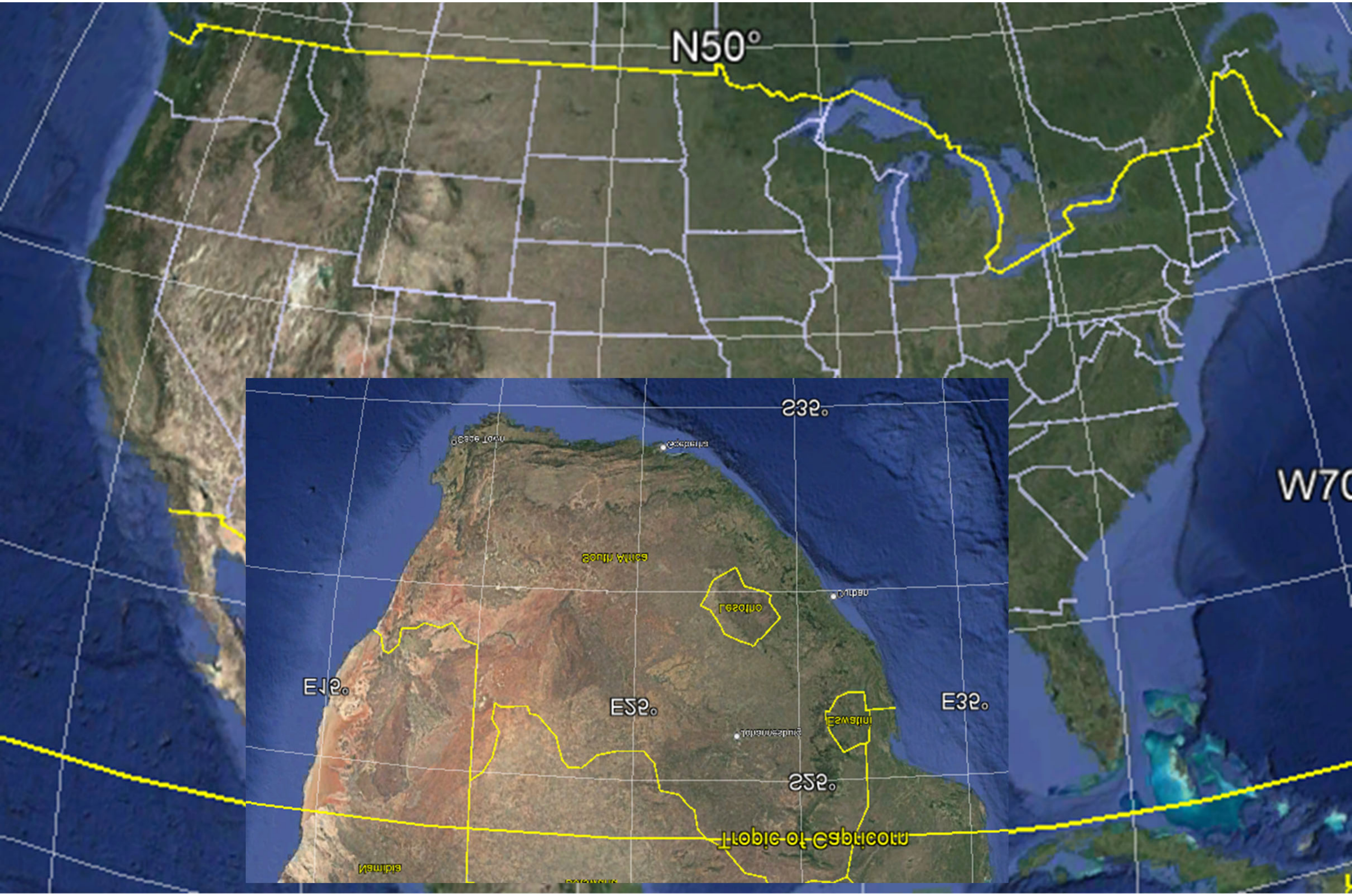

Moscow
London
Berlin
Kiev
Winnipeg
Rome
Madrid
Ankara
Denver
New York
ATL
Atlanta
Jerusalem
Cairo
Miami
Sahara
Nubian Desert
Mexico City
Khartoum
Dakar
N'Djamena
Conakry
Panamá
Lagos
Atlantic Ocean
Nairobi
Manaus
Kinshasa
Lima
Salvador
Lusaka
Altiplano
Antananarivo
Sao Paulo
Namib Desert
JNB
Johannesburg
Buenos Aires

AIRPLANE SAFETY

Thousands of planes in the air at any time.

Why are there not more accidents?


Botswana
Namibia
S23°
Swakopmund
Tropic of Capricorn
Gaborone
S25°
Pretoria
Johannesburg
Maputo
Eswatini
S27°
E13°
E15°
E17°
E19°
E21°
E23°
E25°
E27°
E29°
E31°
E33°
S29°
Bloemfontein
Lesotho
Durban
South Africa
S31°
S33°
East London
Cape Town
Gqeberha
S35°


N50°
S35°
South Africa
Lesotho
E15°
E25°
E35°
Eswatini
S25°
Tropic of Capricorn
Namibia

NHERI NCO
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South African Background

- I was born in Apartheid South Africa in 1957 to a middle class white family
- Father – electrical engineer turned to Presbyterian ministry
- Mother – math teacher

Blacknest, Parktown North, Johannesburg, SA.

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South African Background

- Grew up in small coastal town of East London
- We lived in one of the few remaining integrated communities

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South African Background

- My father started the first racially integrated Presbyterian congregation in South Africa

North End Presbyterian Church Youth Group

South African Background

University of the Witwatersrand

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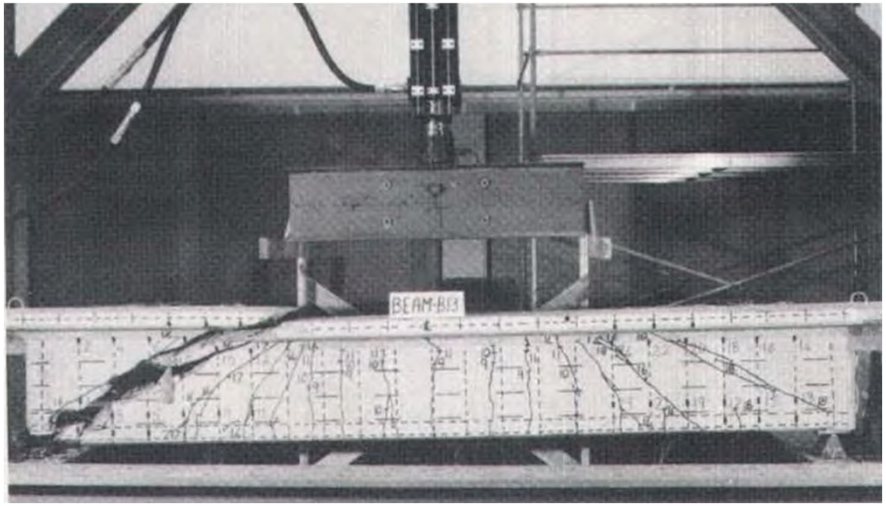
CE Graduating Class 1978

Ove Arup Engineer-in-Training

MS at Rice University



Shear Strength of Prestressed Concrete T-Beams with Welded Wire Fabric as Shear Reinforcement
PCI Journal, 1987

Ove Arup Engineer-in-Training

Dwaalboom Cement Factory, Western Transvaal

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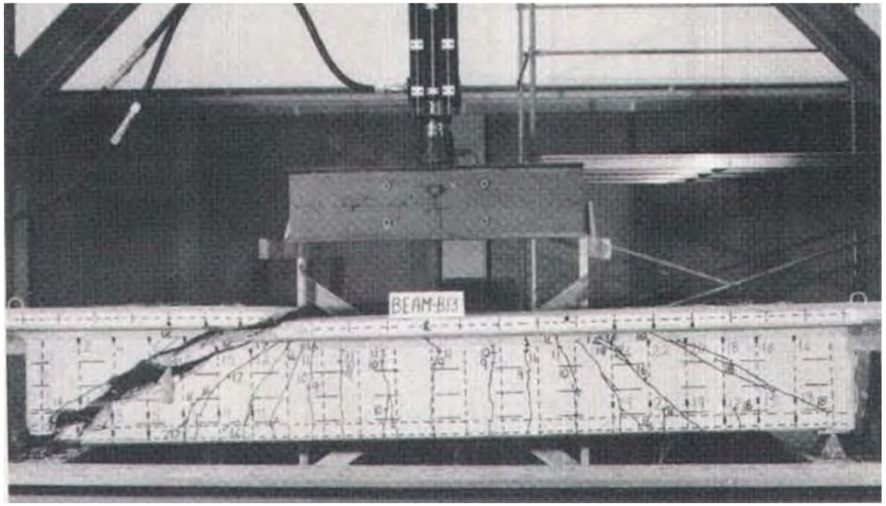
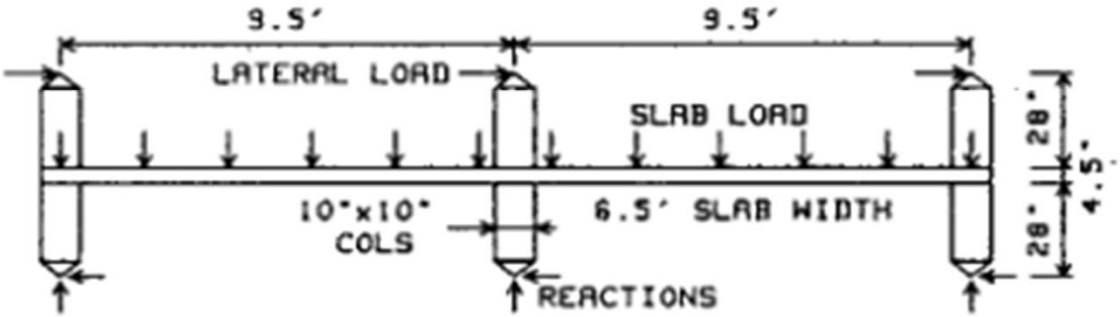
MS and PhD
Rice University



Shear Strength of Prestressed Concrete T-Beams with Welded Wire Fabric as Shear Reinforcement
PCI Journal, 1987



Gravity Load Effect on Seismic Behavior of Slab-Column Connections
ACI Journal, 1992

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Walter P. Moore and Associates

Walter P. Moore Jr.

- Joined WPMA in 1990 - 1992
- Worked on a number of building and arena projects
- Obtained Greencard and PE license

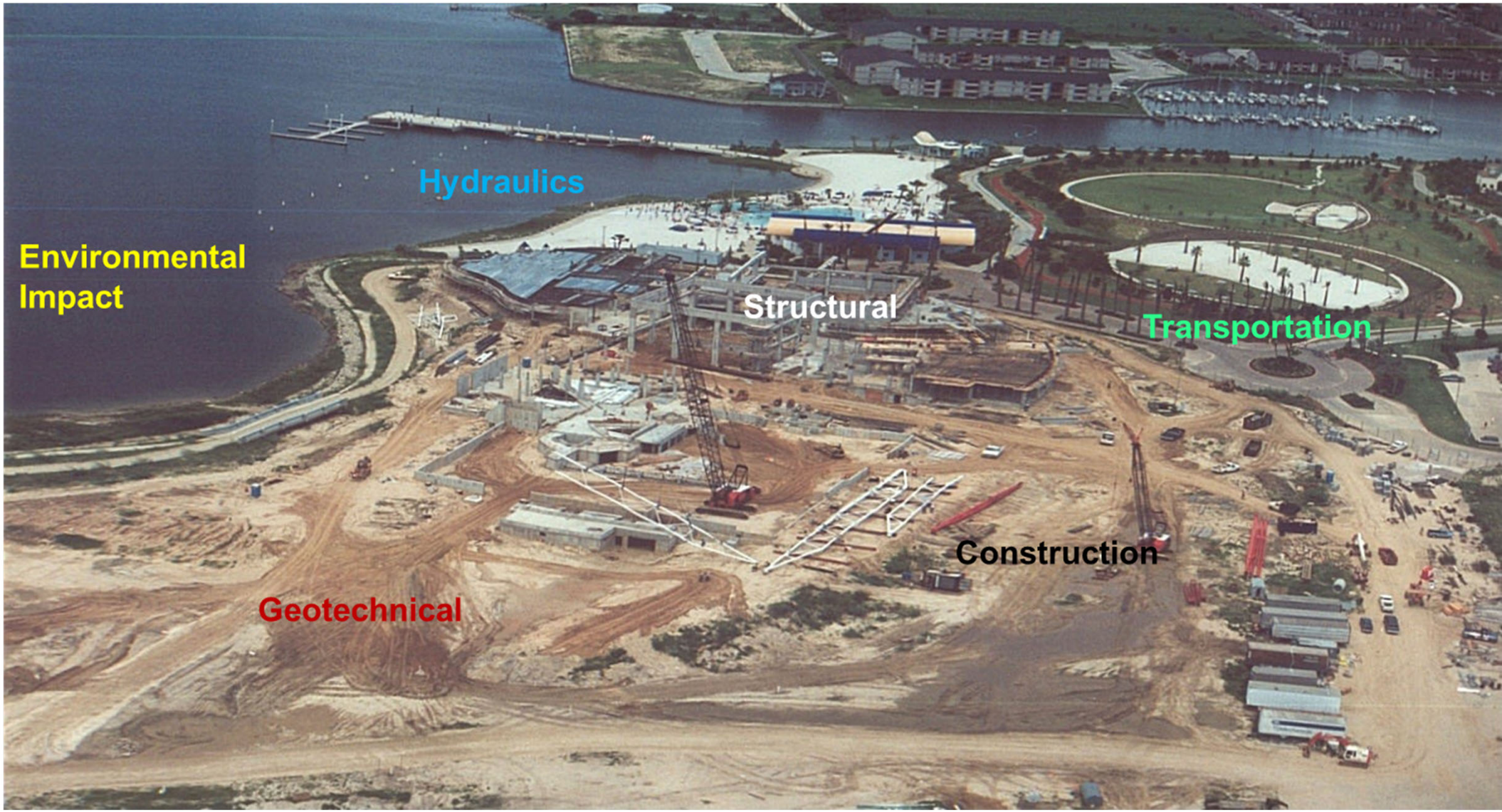
WPMA Projects

312 Walnut
Cincinnati, OH

Moody Gardens
Galveston, TX

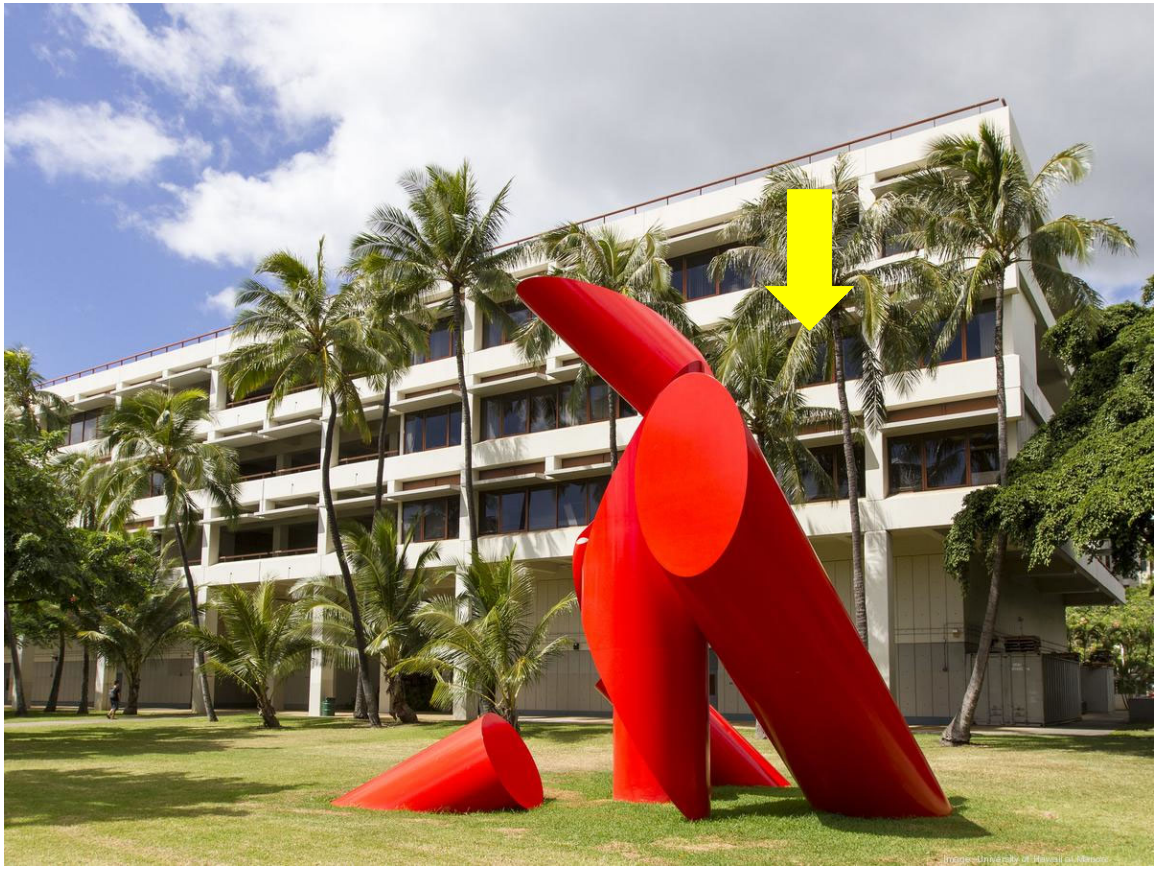
Moody Gardens, Galveston, TX

Moody Gardens, Galveston, TX



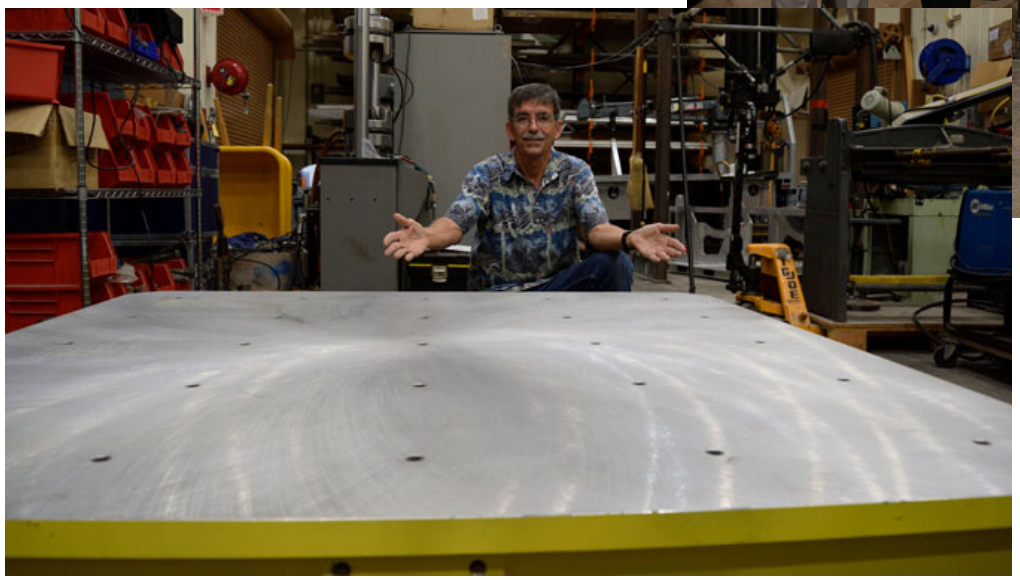
University of Hawaii

- Hired as Asst. Prof. Aug. 1992
- Asso. and Full. Prof. in 1997 and 2005
- Dept. Chair 2020-2023
- Prof. Emeritus 2024



Gate of Hope (1972) by Alexander Liberman in front of Holmes Hall, College of Engineering

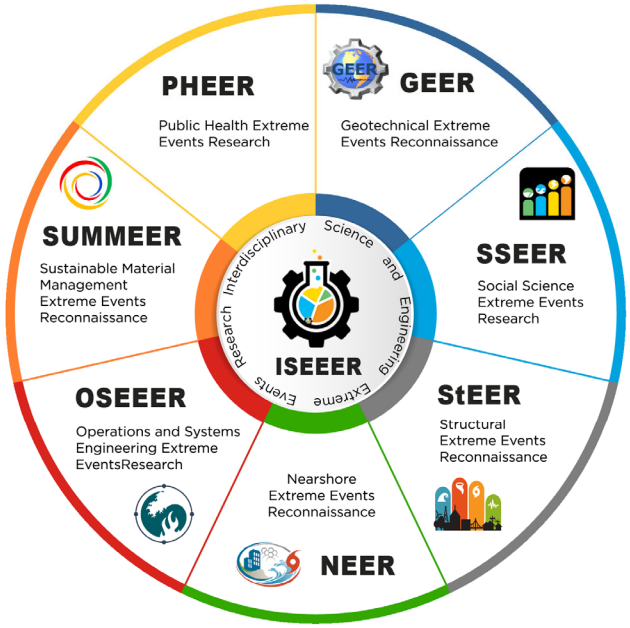
University of Hawaii

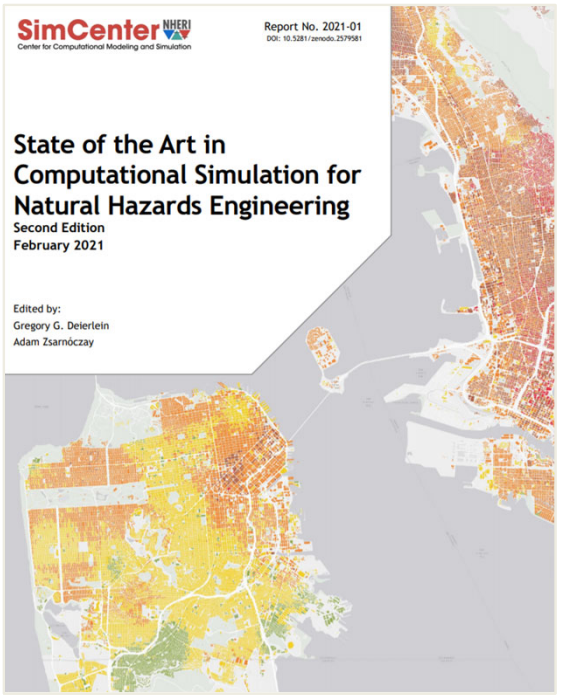


NHERI Science Plan – 3rd Edition

The new edition better synthesizes social sciences, equity issues, climate change, field reconnaissance, laboratory research, simulation tools, and practitioner guidance to address more holistically community resilience to future natural hazard events.

The NCO convened an enhanced Science Plan Task Group to develop the 3rd Edition of the Science Plan.





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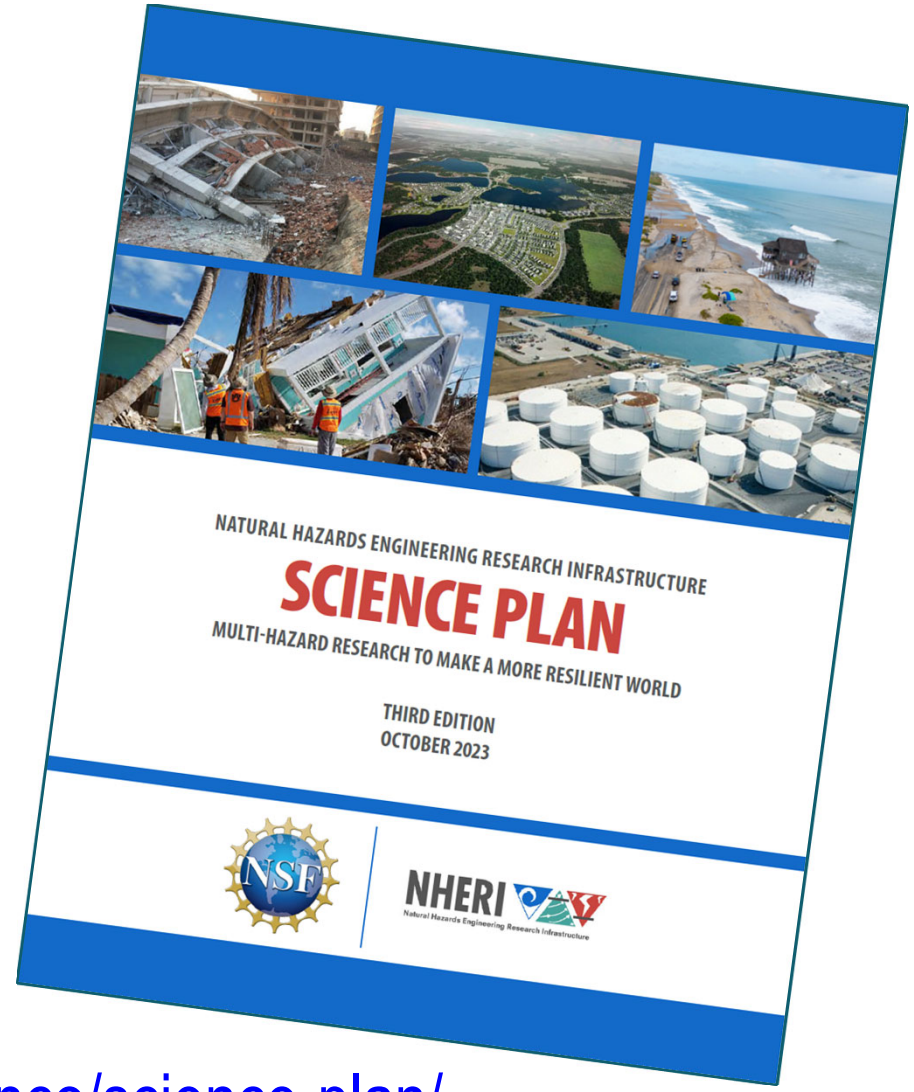
NHERI Science Plan – Workshop

- The NHERI NCO organized a workshop held June 16-17, 2022 in Alexandria, VA
- 63 diverse attendees including, NHERI researchers, NSF and NIST, practitioners, early career faculty, and EF reps.
- Five excellent Keynote speakers to stimulate discussion and creativity
- Five break-out groups that developed a new set of seven Research Campaigns

NHERI Science Plan – Third Edition

- Published October 2023
- Wide dissemination
- Podcast introduction
- Video vignettes planned
- Presentations like this.



Science Plan available at:

https://www.designsafe-ci.org/facilities/nco/science-plan/

NHERI NCO Network Coordination Office

Purpose

The NHERI Science Plan provides the natural hazards research communities (geophysical and atmospheric hazards), including NSF and other funding agencies, a roadmap for high-impact, high-reward, hazards engineering research at NHERI facilities.

The research community is encouraged to organize coordinated campaigns to fulfill the vision articulated by the hazards community in this plan.

The research results are intended to prevent loss of life, reduce damage and economic losses, and improve community resilience to these natural hazards.

Audience

- Researchers working on geophysical and atmospheric hazards
- Agencies funding hazards research
- Junior researchers and graduate students

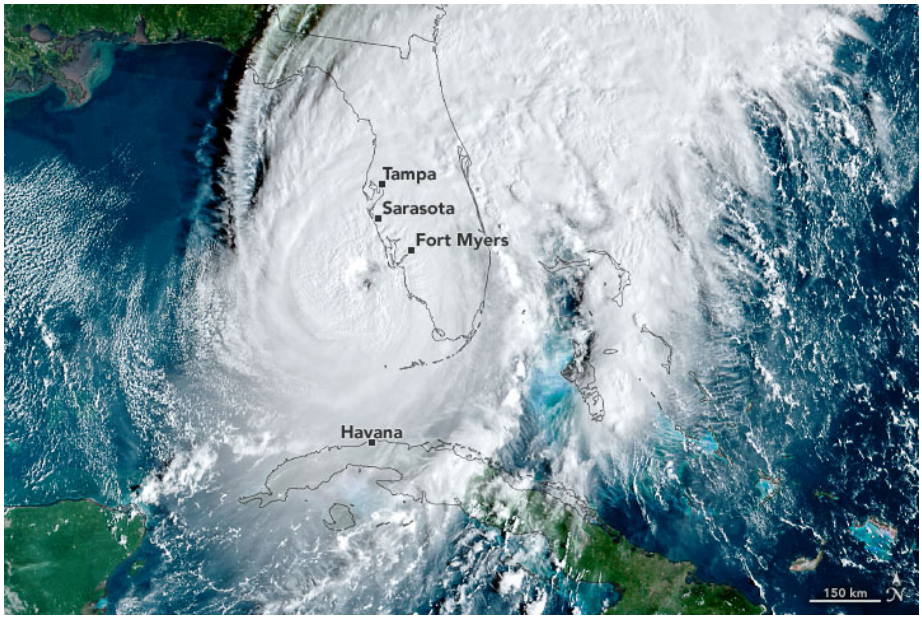
Summer Institute, 2022

- Provide the broader hazards community with a common vision for improving community resilience and sustainability of existing and future built environment

Three Grand Challenges

- Identify and quantify the characteristics of *single, co-occurring, and compounding natural hazards* - whether of *geophysical and/or atmospheric origin* - that have the *potential to harm people, damage civil infrastructure, and to disrupt communities*.

Hurricane Ian, 2022



- Assess the *exposure, vulnerability, and adaptive capacity* of *civil infrastructure and social systems* in areas threatened by natural hazards.

- Invest in a *diverse hazards workforce* and develop the technologies and tools to support the *design, construction, retrofit, and operation of equitable, sustainable, and resilient civil infrastructure for the nation*.

NHERI NCO
Network Coordination Office

NEHRI Technology Transfer Committee, TTC

- TTC initiated by the NHERI NCO in Dec. 2017
- Consists of 15-20 volunteers – mostly practicing engineers knowledgeable of implementation paths of research, not only into building codes, but also directly into practice
- Expertise in all areas of natural hazards research
- Developed "Common Mechanisms for Implementation of NHERI Research Results" available from DesignSafe at this QR Code
- Reviewing all NHERI projects for potential implementation.

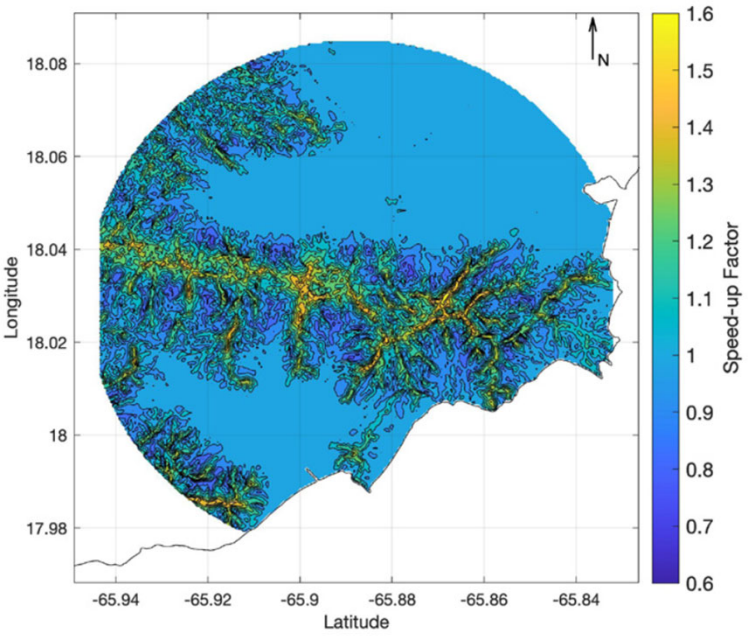
TTC White Paper

"NSF long has sought to accelerate the development of technology from fundamental research to move innovations into practice and create those partnerships that make it all happen".
Susan Margulies – Asst. Director, NSF - Engineering Directorate

NHERI NCO
Network Coordination Office

Five Technology Transfer Success Stories

1 Performance of Elevated Wood Buildings during Hurricane Michael – Elaina Sutley



2 Machine Learning and Atmospheric Simulation to study Topographic effects on extreme wind speeds – Forrest Masters

3 Modeling of above-ground storage tanks during storm events – Jamie Padgett

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Five Technology Transfer Success Stories

4 A Resilience-based Seismic Design Methodology for Tall Wood Buildings, also known as NHERI Tallwood – Shiling Pei

5 Liquefaction Mitigation of Silts using Microbially Induced Desaturation (MID) and Field Testing with NHERI UTexas Large Mobile Shakers – Edward Kavazanjian and Arash Khosravifar

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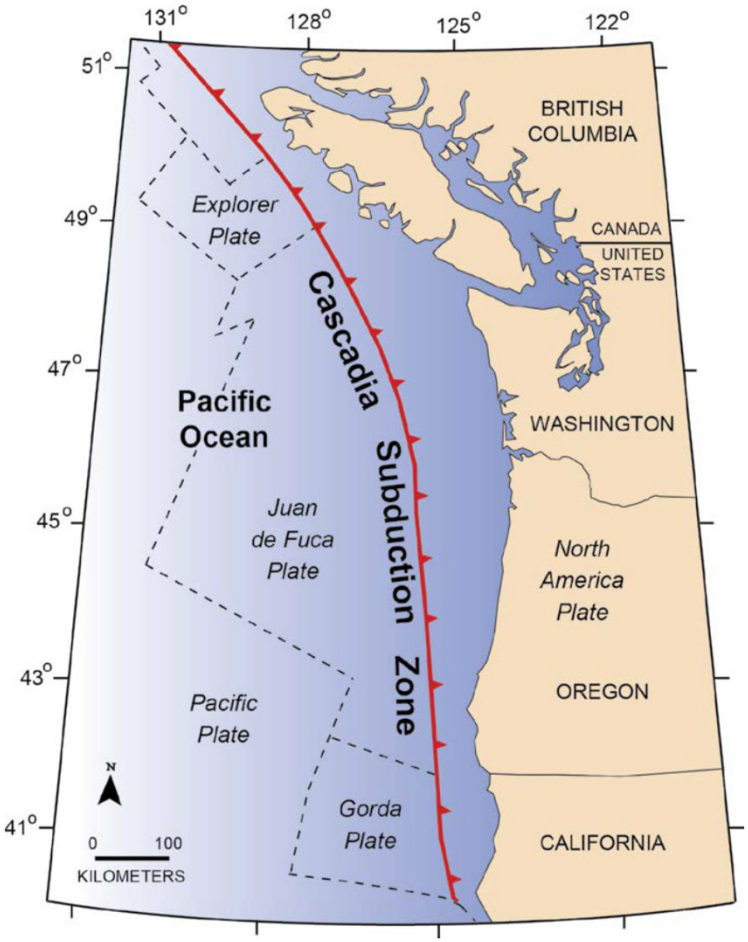
Network Coordination Office

Appendix A: Seven Research Campaigns

1 Understanding and Reducing Vulnerability of Low-Income Communities to Windstorms



2 Increasing Regional Resilience to Mega Seismic Events: Cascadia Subduction Zone Earthquake and Tsunami

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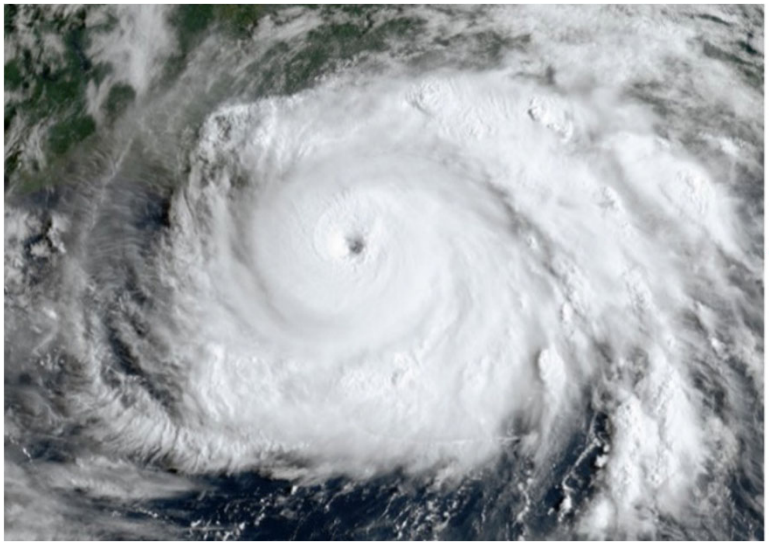
Network Coordination Office

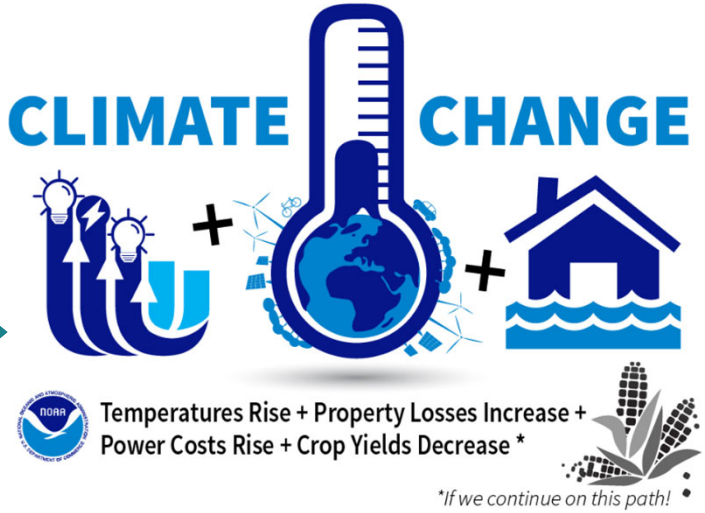
Appendix A: Seven Research Campaigns

3 Cascading and Compounding Impacts of Natural Hazards



4 A Community-Driven Integrated Research Campaign for Hurricanes

5 Infrastructure Impacts of Climate Change-Induced Migration



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Appendix A: Seven Research Campaigns

6 Net-Zero Building Materials and Construction

7 Securing our Nation through Communication and Education (SeNCE)

5 Additional Research Campaigns in the 2nd Edition of the NHERI Science Plan!

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Keys to Success for NHERI Proposals

1. Develop credible research questions with *multi-hazard applications*
2. Include demographically and functionally *diverse research teams*
3. Include *social scientists*, such as an economist, urban planner, or policy analyst to evaluate cost effectiveness of societal impact of a new technology. Convergent research requires integration of inputs and outputs from different team members inextricable woven together.
4. B*uild a credible team*: Convergence is one of NSF's Ten Big Ideas.
5. Contact any *NHERI facility* involved in the proposed research.
6. Get *letters of collaboration* from any supporting partners, but not simply recommendation letters.
7. If your research project involves testbed implementation in existing communities, it is imperative that you *involve representatives of those communities* in the proposal development process and throughout the project.

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Keys to Success for NHERI Proposals

8. Where appropriate, include a team member experienced with *industry implementation* of the anticipated research findings. The NHERI Technology Transfer Committee (TTC) can assist with locating experienced practitioners willing to join research teams.
9. Plan from the outset how the research can be incorporated into *academic curricula and practice*, and what steps might be needed to accomplish the transfer.
10. Include a *time horizon* for potential implementation of the research findings in order to maximize societal impact.
11. "*Red team*" your draft proposal: Share your draft with trustworthy colleagues not involved in your team to get their feedback as a preliminary peer review of your proposal.

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Appendix C: NHERI Experimental Facilities and Components

information, visit the
DesignSafe website: DesignSafe-ci.org

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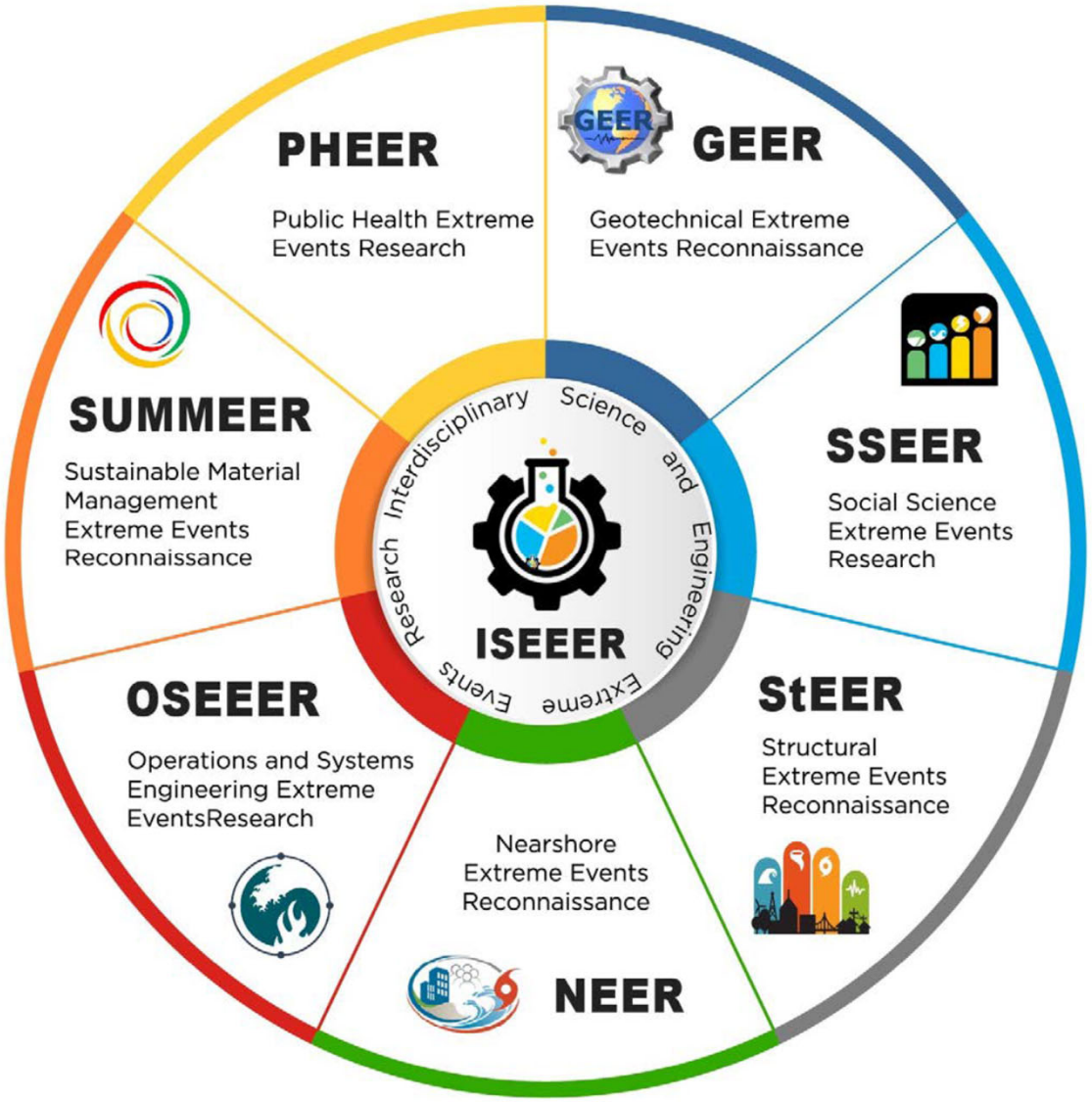
Appendix D: Extreme Event Reconnaissance and Research Networks (EERs)



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NHERI Science Plan Version 3.0

This 3rd Edition will serve as a roadmap for NHERI researchers and others working on mitigating the effects of natural hazards on our communities.

"NHERI and other scientific networks are critical to move quickly, at speed and scale, to go from basic research, fundamental engineering research, to implementation by individuals, communities and other agencies."
Susan Margulies – Asst. Director, NSF - Engineering Directorate

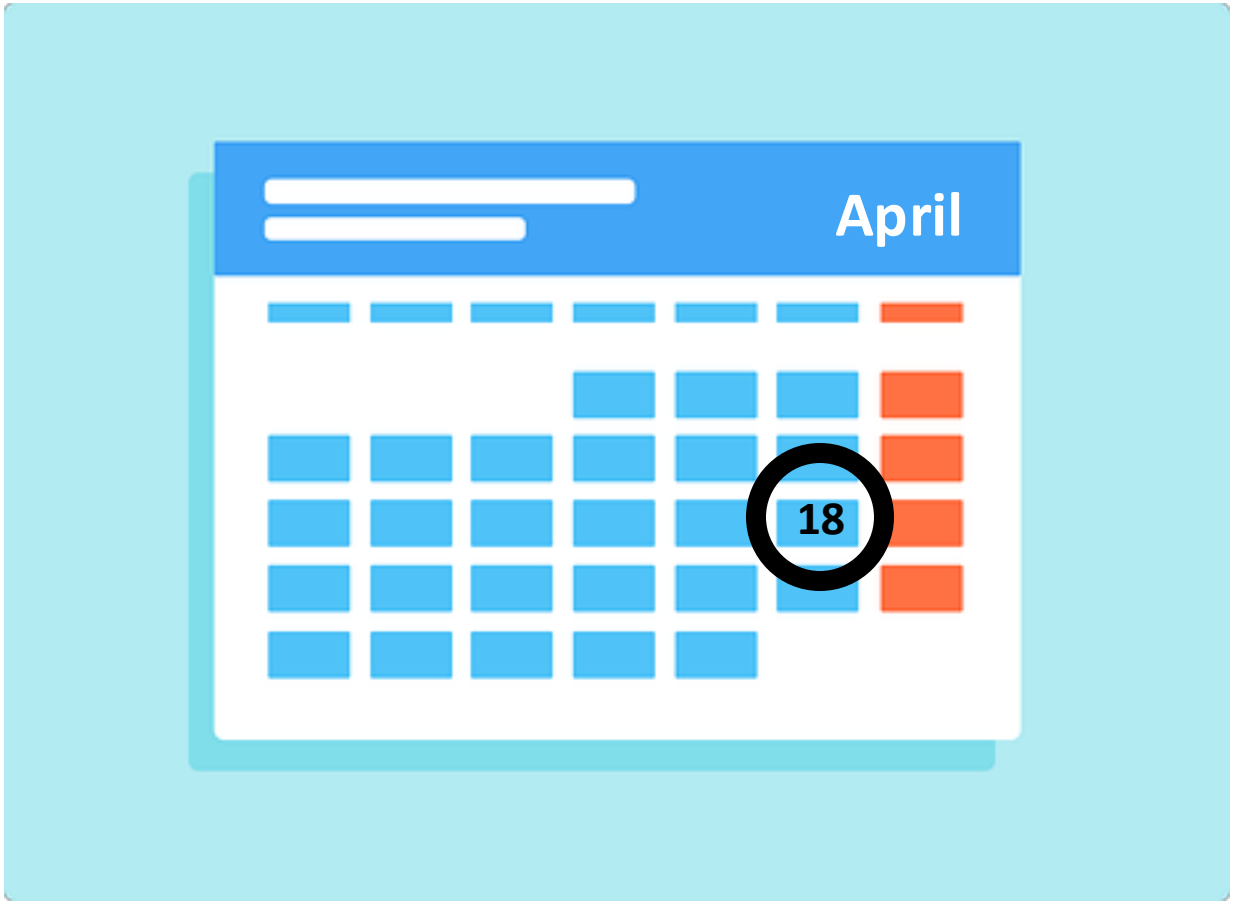
NHERI NCO
Network Coordination Office

NHERI
Natural Hazards Engineering Research Infrastructure

Thank You – Any Questions?

Future Meeting Dates

3rd Friday of every month at 11:00am CST



NHERI GSC
Graduate Student Council

NHERI GSC Research Subcommittee Meetings!

Group Breakout Rooms!

Breakout Rooms (*30 Minutes*):

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Mohamed Hassan

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Erin Boyle

RSR of Social Science

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Simulation & Computational Methods RSR Meeting

Technical Overview on Intensity Measures for Short-Period Structures and Their Non-Structural Components

Friday, March 21, 2025,
12:00 pm – 12:30 pm CT

Angeliki Gerontati

NSF | NHERI GSC Graduate Student Council

Speaker Introduction

Angeliki Gerontati,
PhD Candidate

National Technical
University of Athens
(NTUA)

AGerontati@mail.ntua.gr

NSF | NHERI GSC Graduate Student Council

Thank you!

Speaker
Angeliki Gerontati
PhD Candidate
National Technical University of Athens (NTUA)
AGerontati@mail.ntua.gr

Organizers
Bijan Sayyafzadeh
Simulation & Computational Methods RSR
B.Sayyaf@yahoo.com

Pooria Mazaheri
Chair of Research
mazaheri@iastate.edu

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Graduate Student Council

Social Science RSR

NHERI GSC

Applying to Faculty Positions at R1 Universitites

Friday, March 21st, 12:00 to 12:30 CT

Dr. Jennifer Johnson

NSF | NHERI GSC Graduate Student Council

Speaker Introduction

Dr. Jennifer Johnson, Professor and Department Chair of the Sociology Department

Department Sociology,
Virginia Tech

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Thank you!

Speakers

Dr. Jennifer Johnson

Professor & Chair of Sociology
Virginia Tech University
jajohnson@vt.edu

Organizers

Erin Boyle

Social Science RSR
erinyafen@vt.edu

Pooria Mazaheri

Chair of Research
mazaheri@iastate.edu

NHERI GSC
Graduate Student Council

The NHERI Network Coordination Office is supported by the National Science Foundation award CMMI 2129782. Any statements in this material are those of the presenter(s) and do not necessarily reflect the views of the National Science Foundation.

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