DESIGNSAFE-CI
A NATURAL HAZARDS ENGINEERING COMMUNITY

DesignSafe Cyberinfrastructure for Natural Hazards Research

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University of Texas at Austin

What is DesignSafe?

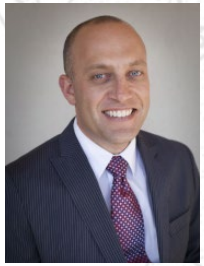
- A web-based research platform to enable transformative research that protects human life and reduces damage during natural hazard events

DesignSafe Vision

- A cyberinfrastructure (CI) that is an integral part of research discovery
  - Provide a platform for data sharing/publishing
  - Enable research workflows and access to high performance computing (HPC)
  - Deliver cloud-based tools that support the analysis, visualization, and integration of diverse data types
- Amplify and link the capabilities of natural hazards researchers in the US and abroad

DesignSafe Management Team

PI / Director
Ellen Rathje
Univ. of Texas



Co-PI
Scott Brandenberg
UCLA

Co-PI
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Co-PI
Jean-Paul Pinelli
Florida Inst. Tech.

Co-PI
Jamie Padgett
Rice Univ.

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Dan Stanzione
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Deputy Director
Tim Cockerill
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Portal Manager
Tracy Brown, TACC/UT

Project Manager
Natalie Henriques, TACC/UT

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NHERI: NATURAL HAZARDS ENGINEERING RESEARCH INFRASTRUCTURE

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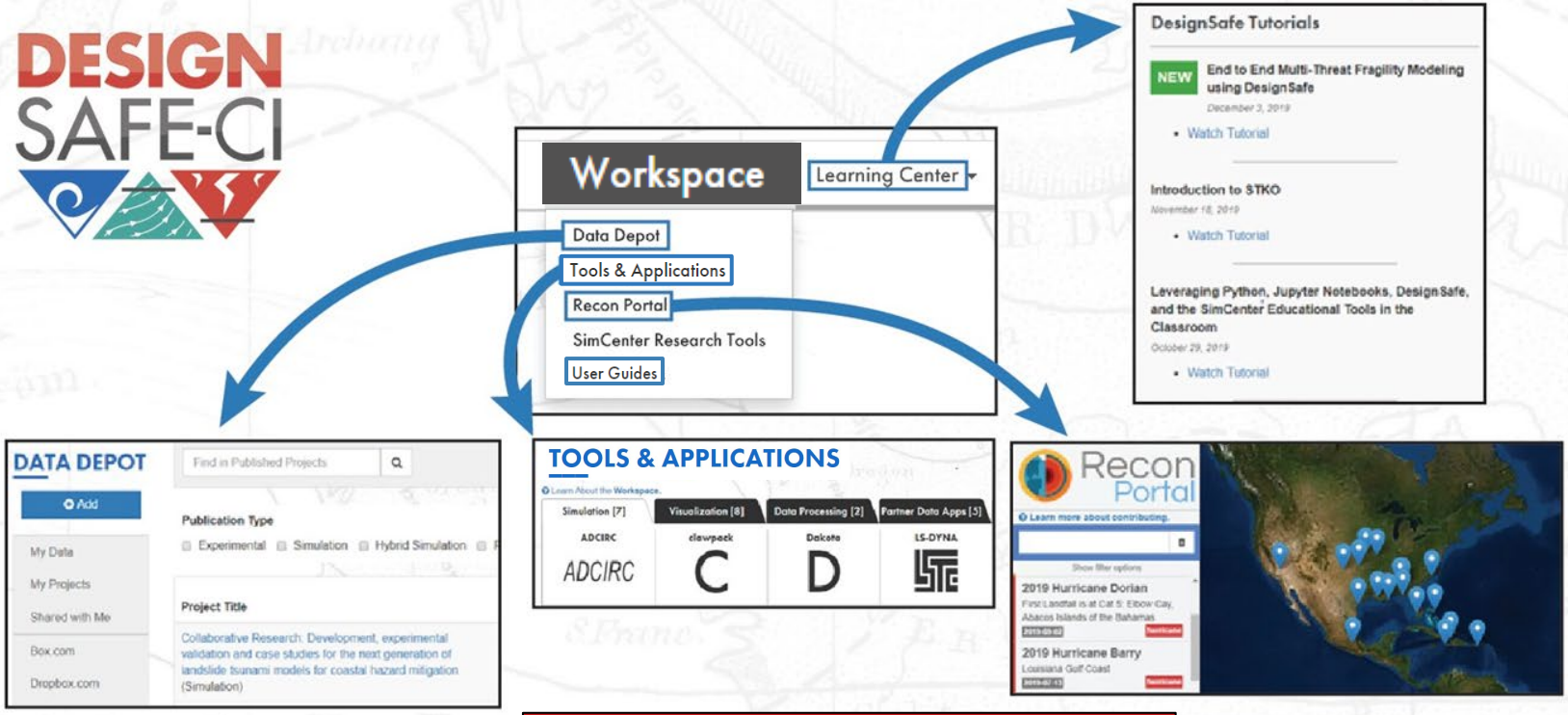
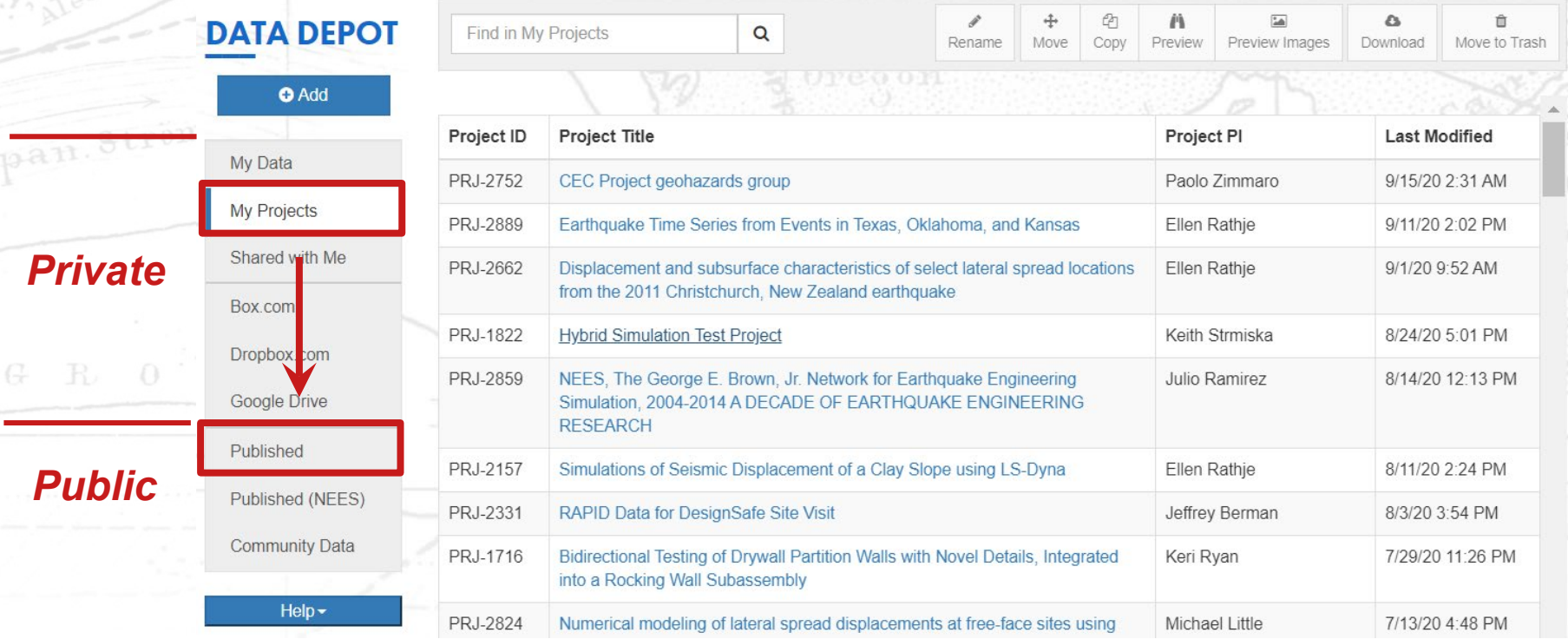
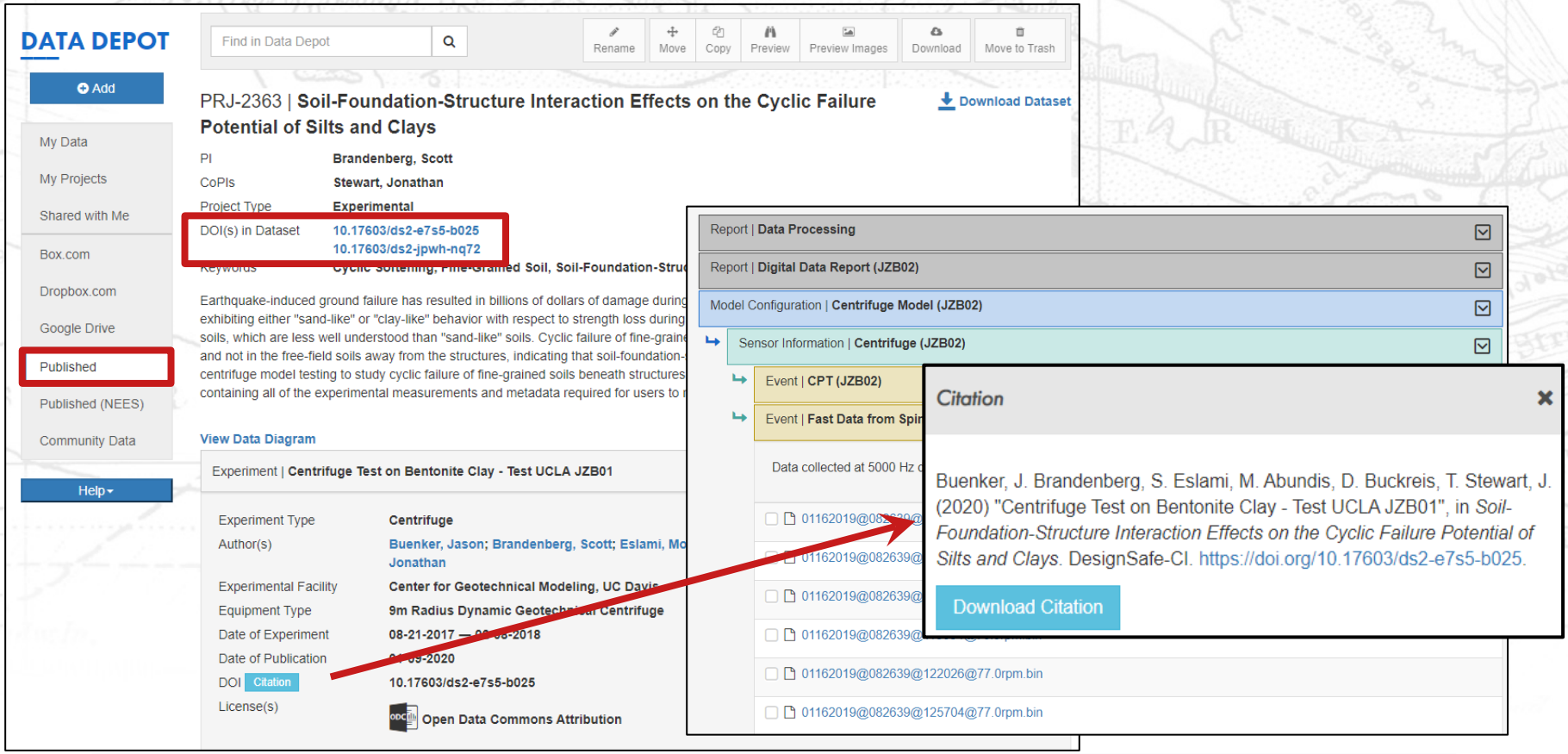
DESIGN SAFE-CI



www.designsafe-ci.org

Data Depot


DATA DEPOT
Add
My Data
My Projects
Shared with Me
Box.com
Dropbox.com
Google Drive
Published
Published (NEES)
Community Data
Help
Private
Public
Find in My Projects
Rename
Move
Copy
Preview
Preview Images
Download
Move to Trash
Project ID
Project Title
Project PI
Last Modified
PRJ-2752
CEC Project geohazards group
Paolo Zimmaro
9/15/20 2:31 AM
PRJ-2889
Earthquake Time Series from Events in Texas, Oklahoma, and Kansas
Ellen Rathje
9/11/20 2:02 PM
PRJ-2662
Displacement and subsurface characteristics of select lateral spread locations from the 2011 Christchurch, New Zealand earthquake
Ellen Rathje
9/1/20 9:52 AM
PRJ-1822
Hybrid Simulation Test Project
Keith Strmiska
8/24/20 5:01 PM
PRJ-2859
NEES, The George E. Brown, Jr. Network for Earthquake Engineering Simulation, 2004-2014 A DECADE OF EARTHQUAKE ENGINEERING RESEARCH
Julio Ramirez
8/14/20 12:13 PM
PRJ-2157
Simulations of Seismic Displacement of a Clay Slope using LS-Dyna
Ellen Rathje
8/11/20 2:24 PM
PRJ-2331
RAPID Data for DesignSafe Site Visit
Jeffrey Berman
8/3/20 3:54 PM
PRJ-1716
Bidirectional Testing of Drywall Partition Walls with Novel Details, Integrated into a Rocking Wall Subassembly
Keri Ryan
7/29/20 11:26 PM
PRJ-2824
Numerical modeling of lateral spread displacements at free-face sites using
Michael Little
7/13/20 4:48 PM



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Make ★your★ data count!

Make your research re-producible and your data re-usable

- ***Formally publish*** data sets in stable data repositories
  - DesignSafe, Zenodo, Dataverse, figshare, Dryad, others
- Data needs a permanent, ***digital location (DOI)*** not just a URL
  - List curated data sets on your CV, just like papers
- Cite data publication ***in your reference list*** of your paper using DOI, citation language

provided here. Additionally, the probabilistic approaches described in this paper are implemented as executable Jupyter notebooks (Saygili 2018a, b). These notebooks can be accessed in the Data

References

Saygili, G., Rathje, E., and Wang, Y. (2018a). "Probabilistic seismic hazard analysis for the sliding displacement of rigid sliding masses [Data set]." Designsafe-CI ⟨https://doi.org/10.17603/ds22d6k⟩

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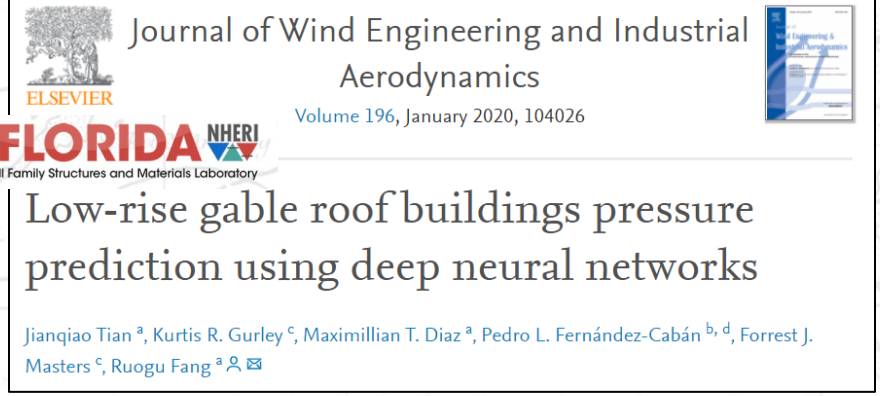
Data Reuse Examples



ELSEVIER

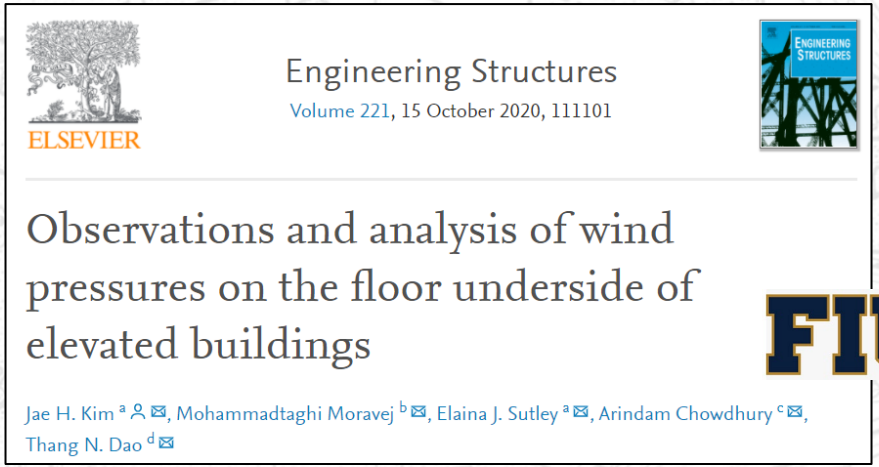
Journal of Wind Engineering and Industrial Aerodynamics

Volume 196, January 2020, 104026

UFLORIDA NHERI
Powell Family Structures and Materials Laboratory

Low-rise gable roof buildings pressure prediction using deep neural networks

Jianqiao Tian [a], Kurtis R. Gurley [c], Maximillian T. Diaz [a], Pedro L. Fernández-Cabán [b, d], Forrest J. Masters [c], Ruogu Fang [a]



ELSEVIER

Engineering Structures

Volume 221, 15 October 2020, 111101

Observations and analysis of wind pressures on the floor underside of elevated buildings

FIU

Jae H. Kim [a], Mohammadtaghi Moravej [b], Elaina J. Sutley [a], Arindam Chowdhury [c], Thang N. Dao [d]

Journal of Performance of Constructed Facilities / Volume 34 Issue 4 - August 2020

Technical Papers

Downloaded 144 times

Performance of Manufactured Housing during Hurricanes Irma and Michael

Elaina J. Sutley, Ph.D., A.M.ASCE; Karen Vazquez, S.M.ASCE; Jae H. Kim, S.M.ASCE; Thang Dao, Ph.D., A.M.ASCE

StEER STRUCTURAL EXTREME EVENTS RECONNAISSANCE

Annual DesignSafe Dataset Awards

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Reconnaissance Portal

Identifying Published Datasets from Recon Events

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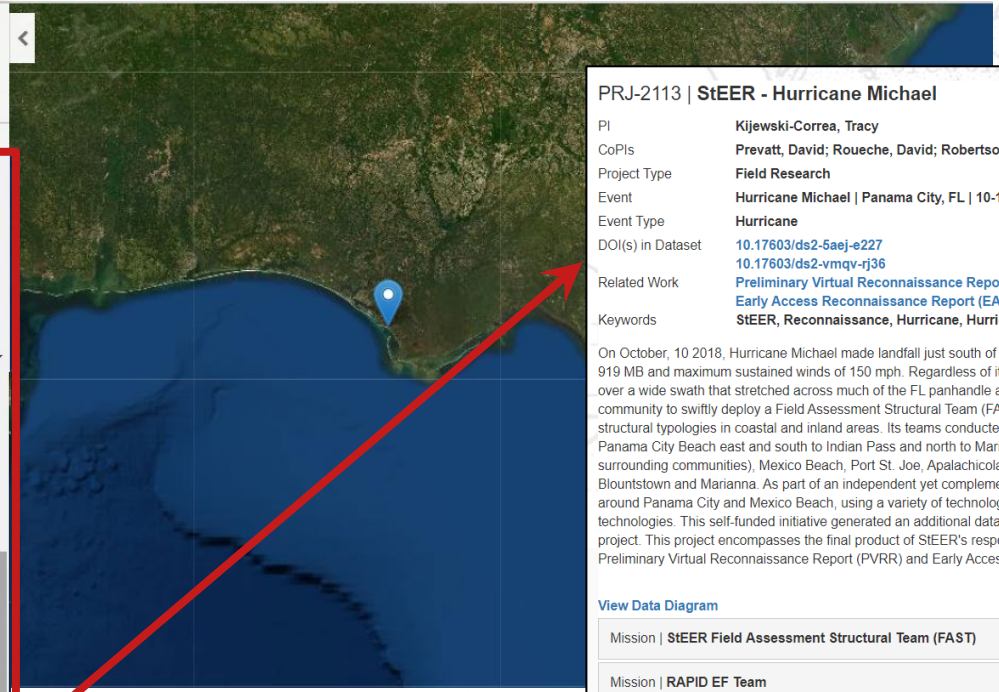
Recon Portal → Data Depot

Recon Portal

Learn more about contributing.

Available datasets:

- Hurricane Michael - StEER P-VAT Report
- Hurricane Michael Field Reconnaissance: Contrasting Performance of Structures at Design Wind Speeds
- ARA Windfield Data Day
- Hurricane Michael - StEER FAT Early Access Report
- NHERI REU: Assessing Structural Damage During Hurricane Michael of Low-Rise Large-Volume Steel Structure using Structure-from-Motion and LIDAR
- NHERI REU: Survey and Investigation of Residential Buildings Damaged by Hurricane Michael
- Assessing the Performance of Elevated Wood Buildings Including Manufactured Housing
- Finalized StEER FAST and RAPID EF teams reports



PRJ-2113 | **StEER - Hurricane Michael**

Download Dataset

PI	**Kijewski-Correa, Tracy**
CoPIs	**Prevatt, David; Roueche, David; Robertson, Ian; Berman, Jeffrey; Mosalam, Khalid; Grilliot, Michael**
Project Type	**Field Research**
Event	**Hurricane Michael | Panama City, FL | 10-10-2018 |** Lat 30.0800° N Long 85.6075° W
Event Type	**Hurricane**
DOI(s) in Dataset	10.17603/ds2-5aej-e227 10.17603/ds2-vmqv-rj36
Related Work	Preliminary Virtual Reconnaissance Report (PVRR) Early Access Reconnaissance Report (EARR)
Keywords	**StEER, Reconnaissance, Hurricane, Hurricane Michael, Damage Assessment, UAS, Laser Scan, Streetview**

On October, 10 2018, Hurricane Michael made landfall just south of Panama City, FL with the National Hurricane Center reporting a minimum pressure 919 MB and maximum sustained winds of 150 mph. Regardless of its place in history, Hurricane Michael caused catastrophic damage from high winds over a wide swath that stretched across much of the FL panhandle and inland into southeastern GA and beyond. natural hazards engineering community to swiftly deploy a Field Assessment Structural Team (FAST). This FAST broadly assessed the performance of a representative subset of structural typologies in coastal and inland areas. Its teams conducted assessments between October 13-15, 2018. FAST collected data in Florida from Panama City Beach east and south to Indian Pass and north to Marianna. The communities assessed included: Panama City Beach, Panama City (and surrounding communities), Mexico Beach, Port St. Joe, Apalachicola, a few routes out to barrier islands in the region, and the inland communities of Blountstown and Marianna. As part of an independent yet complementary effort, the RAPID EF continued data collection on November 7-8, 2018 in and around Panama City and Mexico Beach, using a variety of technologies including unmanned aerial vehicles, laser scanners and applied streetview technologies. This self-funded initiative generated an additional dataset that complements the data collected by StEER and is thus curated jointly in this project. This project encompasses the final product of StEER's response to this event: Curated Dataset, linking to previously published products: Preliminary Virtual Reconnaissance Report (PVRR) and Early Access Reconnaissance Report (EARR).

View Data Diagram

Mission | **StEER Field Assessment Structural Team (FAST)**

Mission | **RAPID EF Team**

E-CI RESEARCH INFRASTRUCTURE

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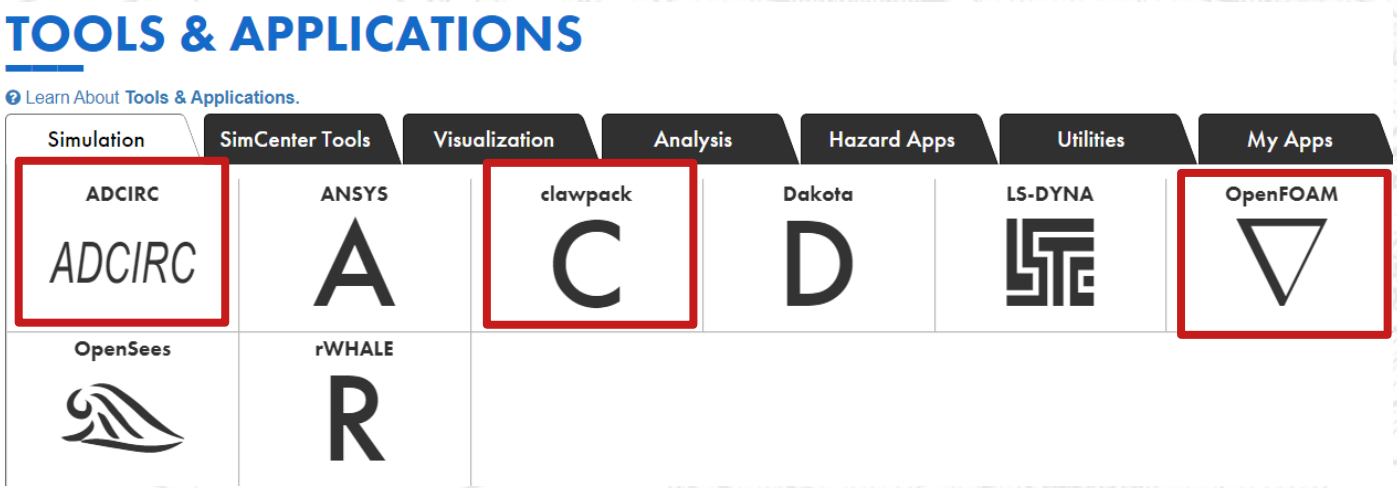
Tools & Apps: Simulation

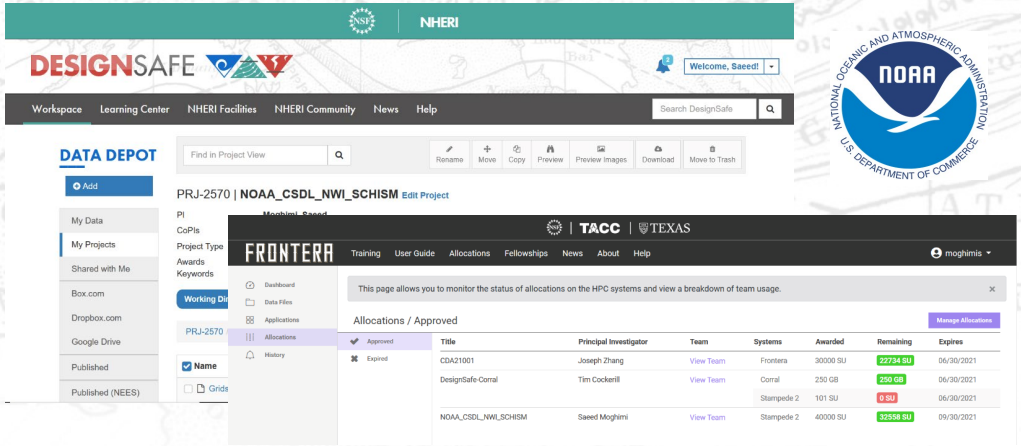


- HPC-enabled simulation codes (Stampede2, Frontera)
- Available through portal or at the Command Line, easy access to HPC allocation (CPUs, GPUs) through DesignSafe

Simulation Support

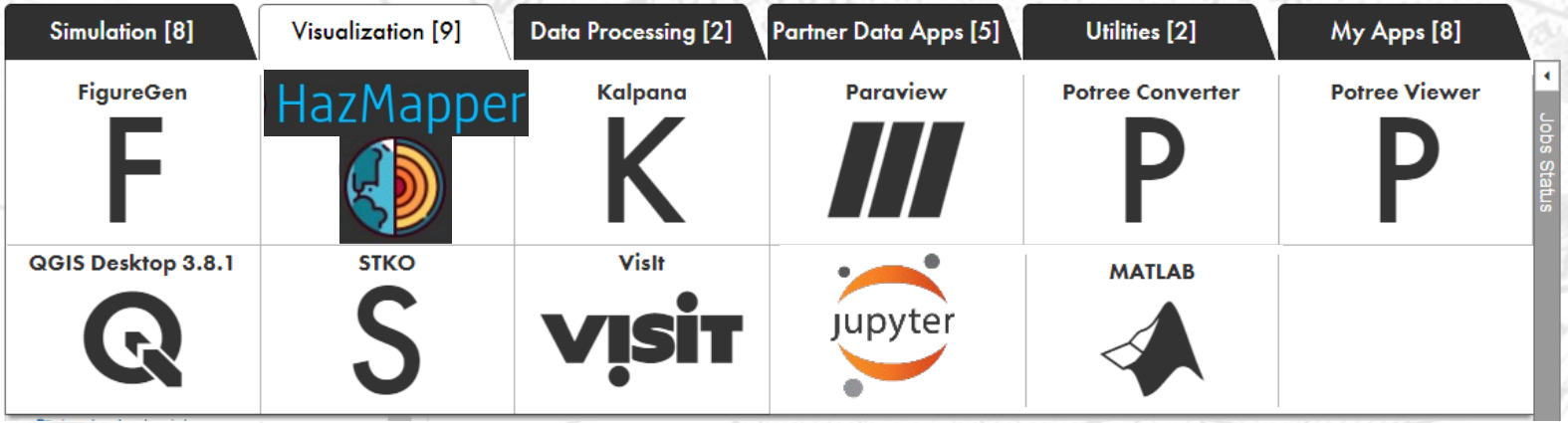
- Assistance in installing codes on TACC HPC systems
- Inland-Coastal Flooding Operational Guidance System (ICOGS)

NOAA's inland coastal flood modeling system that enhances modeling capabilities for wet storms with storm surge and heavy precipitation



Contact: Saeed.Moghimi@noaa.gov

Tools & Apps: Data Analysis



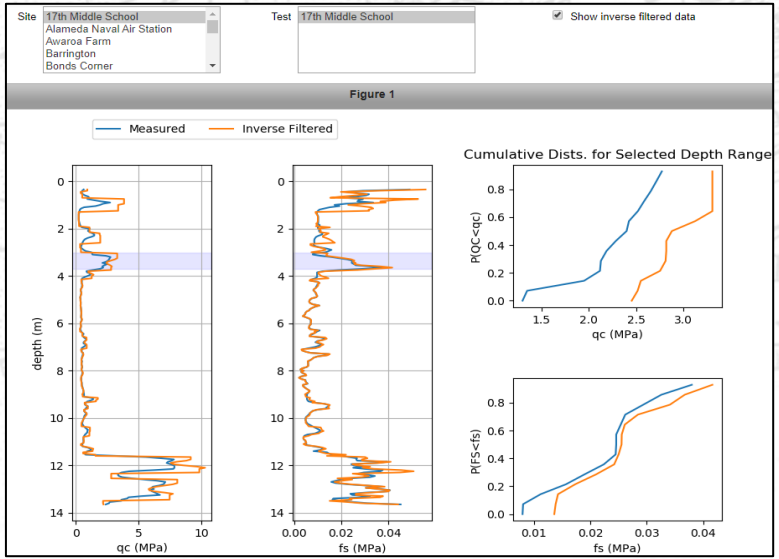
- Cloud-based tools for data analysis and visualization
- Access to files in Data Depot

Jupyter Notebooks

- Electronic notebooks in Python or R
- JupyterHub in DesignSafe
  - Access to Data Depot files
- Interactive data viewer
- Can write scripts for data processing, AI or machine learning
- Publish for use by others
- Accelerates data reuse, adoption of approaches into practice

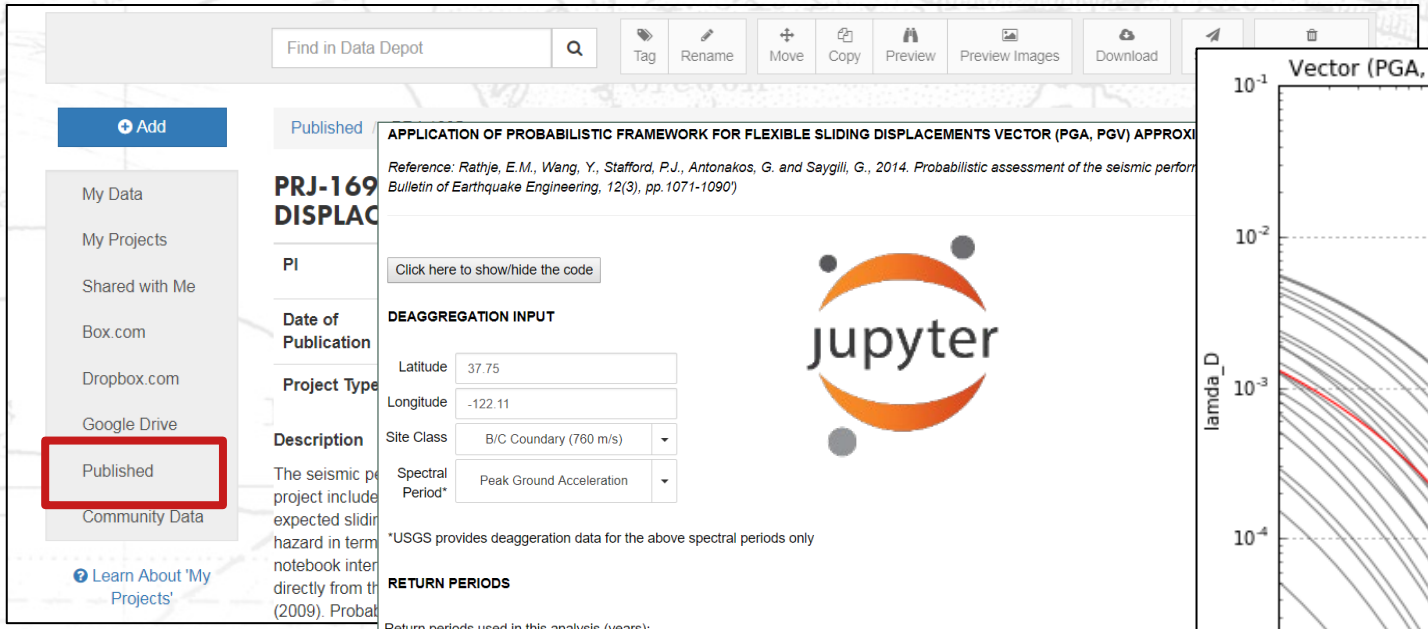
jupyterhub

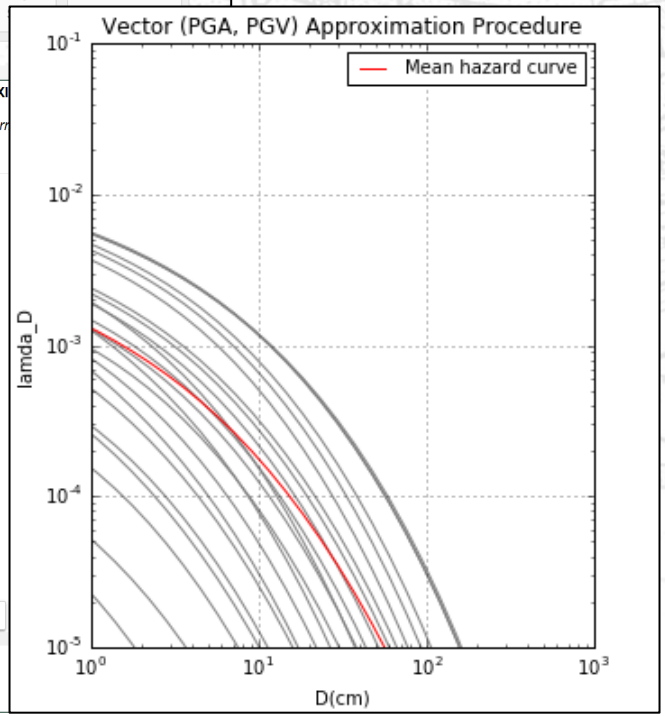
Next Generation Liquefaction



From Scott Brandenberg (UCLA)

Interoperability with USGS EQ Hazard Tools





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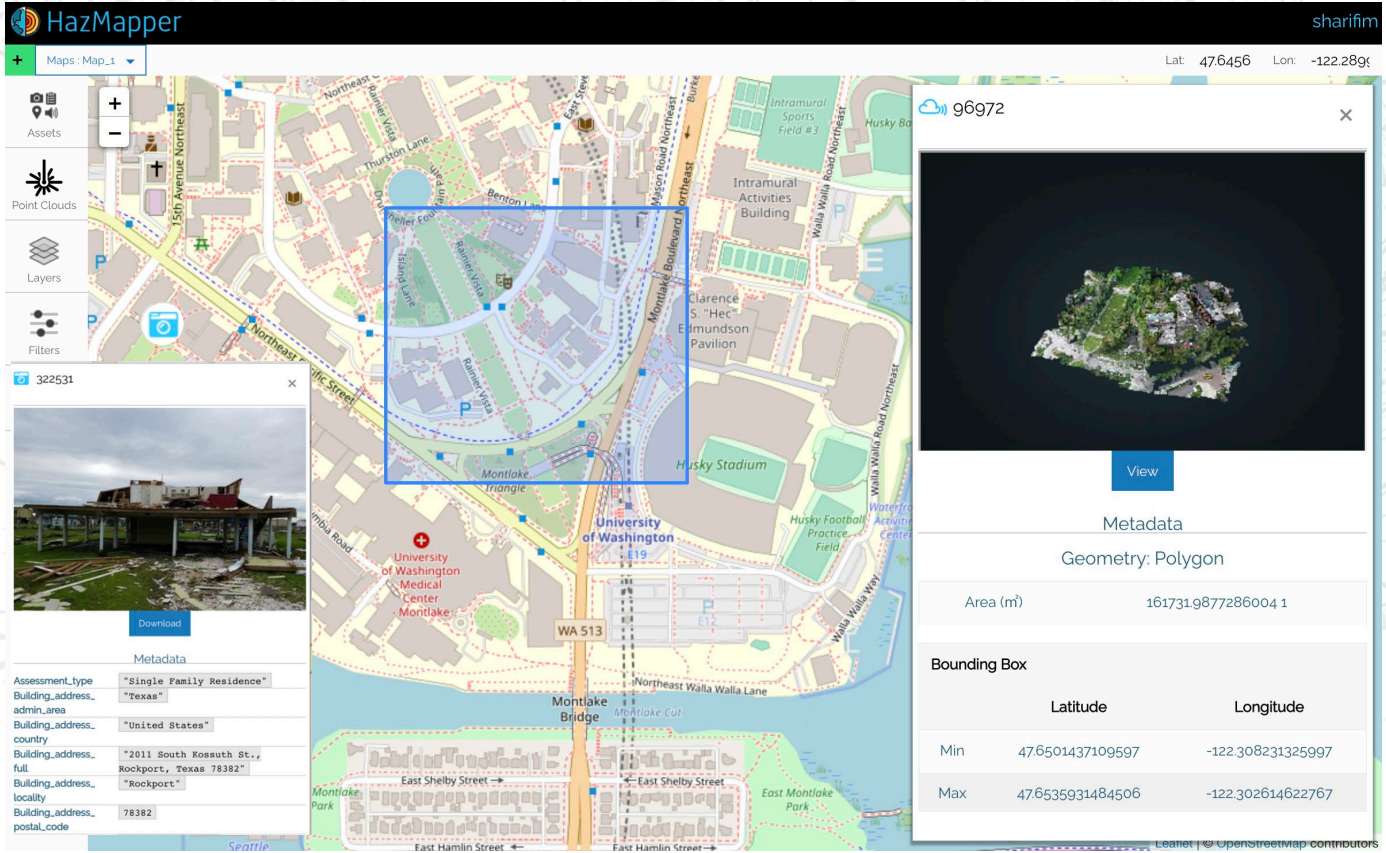
HazMapper

- Easy access to images and point cloud data
- Location and preview exposed
- Link to Potree viewer provided
- Links to Streetview imagery (Mapillary)



Learning Center

DESIGNSAFE

Workspace | Learning Center

Education & Training

Archived DesignSafe Webinars

https://tinyurl.com/DesignSafe-Webinars

DesignSafe Tutorials

NEW **Development and utilization of a relational database to support post-earthquake building damage and recovery assessment**

March 12, 2021

- Watch Tutorial

Experimental Data Workflow for Real Time Decision Making Using Python and Jupyter Notebooks

February 3, 2021

- Watch Tutorial

Leveraging DesignSafe with TAPIS

December 17, 2020

- Watch Tutorial

Best Practices to Enhance the Quality, Discoverability and Re-Use Potential for Post-Event Reconnaissance Data

November 11, 2020

- Watch Tutorial
- Presentation Slides

SimCenter Webinars

NEW **Physical Modeling of Wave Attenuation & Wave Force Reduction by a Mangrove Forest**

December 4, 2020

- Watch Webinar

Computational Frameworks for the Implementation of Performance-Based Wind Engineering

November 23, 2020

- Watch Webinar

Partial Turbulence Simulation for Predicting Peak Wind Loads on Buildings

October 16, 2020

- Watch Webinar

Hurricane Loss Analysis for Single-Family Houses Considering Current and Changing Climate Conditions

October 6, 2020

- Watch Webinar

DesignSafe: We are here for you!

Available to the Global Natural Hazards Research Community

slack

- Interact with us and the community using the DesignSafe Slack team
- Cite data using DOIs in your reference list!

MAKE DATA COUNT

Please share your feedback, ideas, experiences!

Ellen Rathje e.rathje@mail.utexas.edu

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