DESIGNSAFE-CI
A NATURAL HAZARDS ENGINEERING COMMUNITY

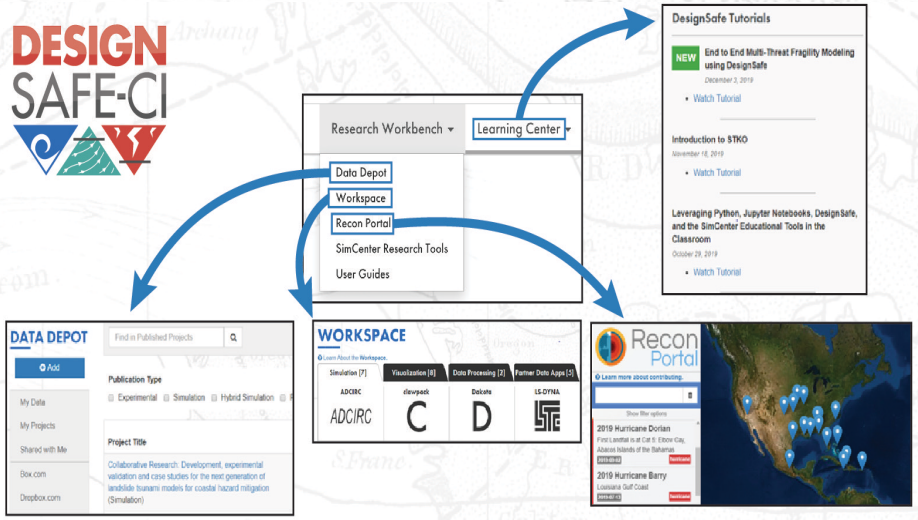
Trust, Accountability, and Community: the DesignSafe Data Depot Repository Trajectory

Maria Esteva

Workshop on Open Data and Reuse in Social Science Weather Research

UC Boulder April 10-12 2023

An End to End Natural Hazards Engineering and Social Science Research Platform



- Data Depot Repository:
  - Engineering datasets since 2016
  - Social Science and Interdisciplinary datasets since 2020.
  - 1128 published datasets
  - 96 Terabytes of data.

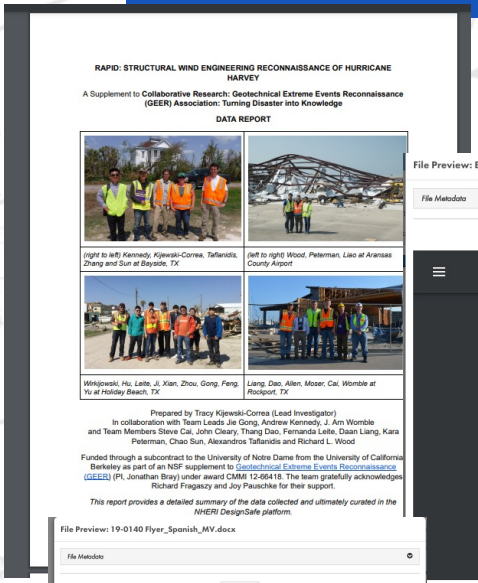
Data, Tools, HPC, Training, Information, Assistance

NSF | DESIGNSAFE-CI NHERI: NATURAL HAZARDS ENGINEERING RESEARCH INFRASTRUCTURE | TEXAS The University of Texas at Austin | UCLA | TACC | RICE | Florida Tech

Trust: The Data Depot is a Certified Trusted Data Repository

- Through 2026
- Complies with standards in:
  - Organizational Infrastructure
  - Digital Object Management
    - FAIR data
  - Technology

A Natural Hazards Repository


RAPID: STRUCTURAL WIND ENGINEERING RECONNAISSANCE OF HURRICANE HARVEY

A Supplement to **Collaborative Research: Geotechnical Extreme Events Reconnaissance (GEER) Association: Turning Disaster into Knowledge**

DATA REPORT

(right to left) Kennedy, Kijewski-Correa, Taflanidis, Zhang and Sun at Bayside, TX

(left to right) Wood, Peterman, Liao at Aransas County Airport

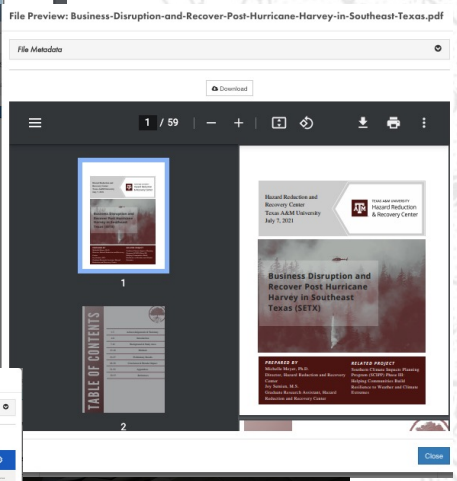
Wirkijowski, Hu, Leite, Ji, Xian, Zhou, Gong, Feng, Yu at Holiday Beach, TX

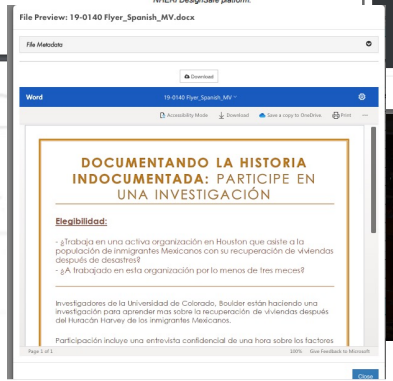
Liang, Dao, Allen, Moser, Cai, Womble at Rockport, TX

Prepared by Tracy Kijewski-Correa (Lead Investigator)
In collaboration with Team Leads Jie Gong, Andrew Kennedy, J. Arn Womble and Team Members Steve Cai, John Cleary, Thang Dao, Fernanda Leite, Daan Liang, Kara Peterman, Chao Sun, Alexandros Taflanidis and Richard L. Wood

Funded through a subcontract to the University of Notre Dame from the University of California Berkeley as part of an NSF supplement to Geotechnical Extreme Events Reconnaissance (GEER) (PI, Jonathan Bray) under award CMMI 12-66418. The team gratefully acknowledges Richard Fragaszy and Joy Pauschke for their support.

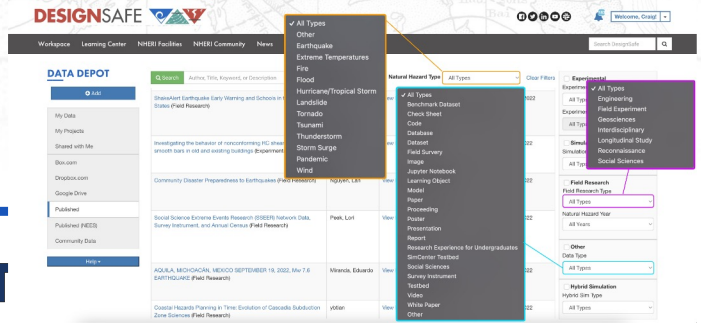
This report provides a detailed summary of the data collected and ultimately curated in the NHERI DesignSafe platform.





- Community input.
- Interdisciplinary data model:
  - Interactive curation.
  - Data Documentation Initiative metadata.
  - Natural Hazard events and types and data types.
  - Representation of large and ongoing research projects.
  - Social Science and Engineering datasets that complement each other.
  - Extreme weather, fire, wind, earthquakes, health, evacuation, economics, food, COVID, disaster announcements, resilience, response, debris, etc.

Different engineering and social science data types published about Hurricane Harvey in the DDR 2018 - 2023. (3,4,6,7)

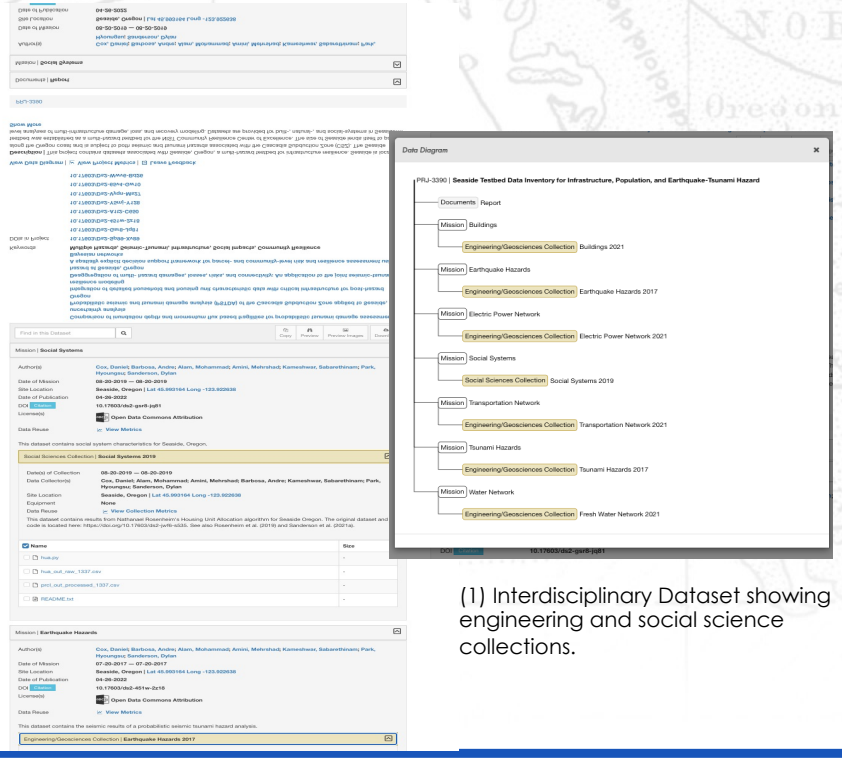


DESIGNSAFE-CI
NHERI: NATURAL HAZARDS ENGINEERING RESEARCH INFRASTRUCTURE

TEXAS
The University of Texas at Austin

UCLA

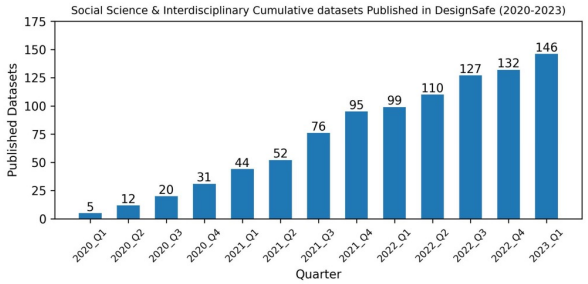
Natural Hazards Data: Urgency and Sensitivity

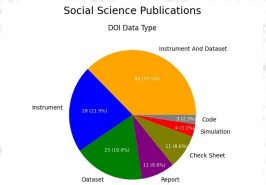


(1) Interdisciplinary Dataset showing engineering and social science collections.

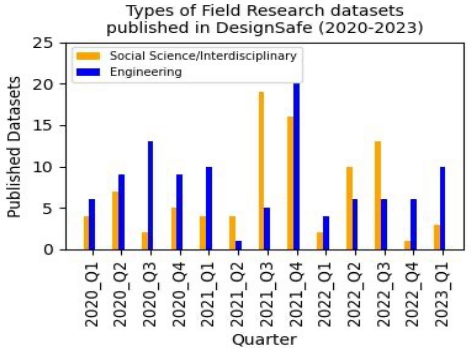
- Fast publication of post-event reports.
- Stand alone publication of reports, instruments, protocols and IRB documents.
- Subsequent publication of curated data.
- Policies, assistance, and infrastructure for protected data.

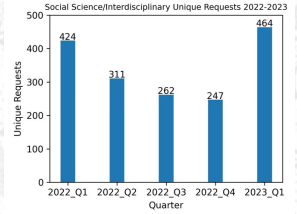
Accountability: Publications and Usage

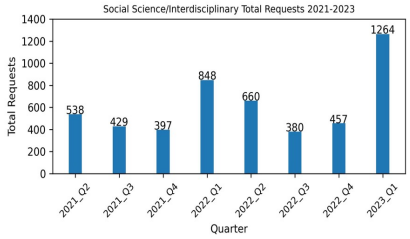




SS/I publications since 2020







Year	Platform citation	Original data citation	Reuse citation	Total
2021	2	7	1	10
2022	1	13	3	17
2023 3 months	-	9	2	11

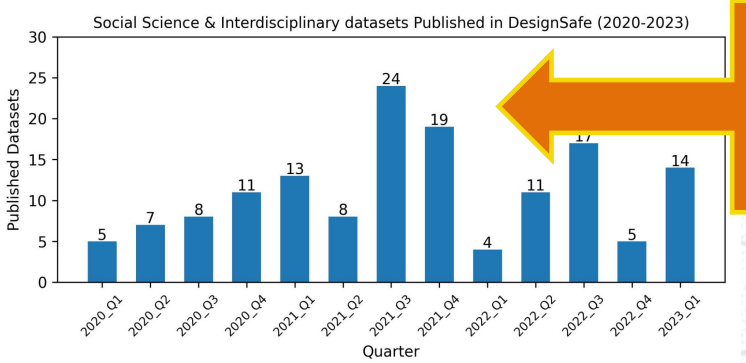
SS/I citations since 2021

A comparison between SS/I and only Engineering field research publications since 2020

SS/I unique and total requests using Make your Data Count Standard since 2020 and 2021

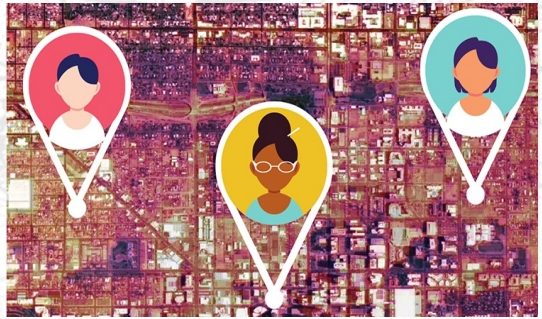
NSF DESIGNSAFE-CI NHERI: NATURAL HAZARDS ENGINEERING RESEARCH INFRASTRUCTURE TEXAS The University of Texas at Austin UCLA TACC RICE Florida Tech

Building Community Through Data

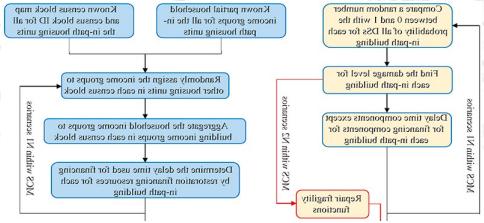


- Data Ambassadors
- Publish your data events
- Office hours.
- Deadlines

- Annual Dataset Awards



- Data Reuse Stories

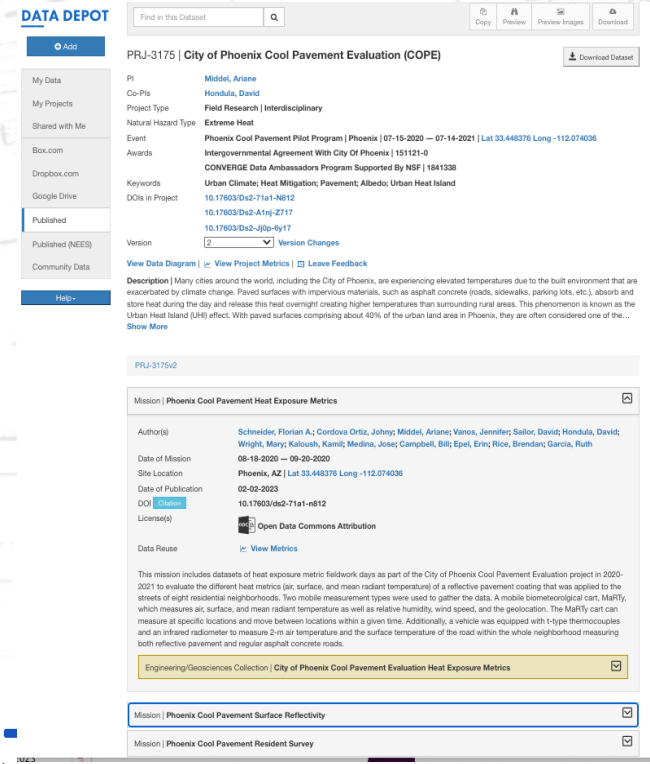


(5) Wanting (Lisa) Wang and John W. van de Lindt, (2021) "Quantitative modeling of residential building disaster recovery and effects of pre- and post-event policies", International Journal of Disaster Risk Reduction, 59, 102259, https://doi.org/10.1016/j.ijdrr.2021.102259

(6) Watkins, L. Wright, M. Chakalian, P. Kurtz, E. Hondula, D. (2021) "Hygrochron Temperature and Humidity iButton and Time Activity Diary - Wave 1", in *Personal Heat Exposure*. DesignSafe-CI. https://doi.org/10.17603/ds2-raki-g122 v1

NSF DESIGNSAFE-CI NHERI: NATURAL HAZARDS ENGINEERING RESEARCH INFRASTRUCTURE
TEXAS The University of Texas at Austin
UCLA
TACC
RICE
Florida Tech

Conclusions



- Improve quality of data publications.
- Incentivize data publication.
- Deconstruct concerns about publishing data.
- Incentivize data reuse.
- Train on data citation.
- More sophisticated stats on data reuse.
- Better automated ways of tracking citations.
- Learn about weather-related datasets.
- Challenge of sustaining data publication infrastructure.

Referenced Datasets

1.Cox, D., A. Barbosa, M. Alam, M. Amini, S. Kameshwar, H. Park, D. Sanderson. (2022) "Report", in *Seaside Testbed Data Inventory for Infrastructure, Population, and Earthquake-Tsunami Hazard*. DesignSafe-CI. https://doi.org/10.17603/ds2-sp99-xv89 v1

2. Roueche, D. B., Lombardo, F. T., Krupar III, Richard J., & Smith, D. J. (2018). *Collection of Perishable Data on Wind- and Surge-Induced Residential Building Damage During Hurricane Harvey (TX)* [Data set]. Designsafe-CI. https://doi.org/10.17603/DS2DX22Rosenheim, Nathanael (2021) "Detailed Household and Housing Unit Characteristics: Data and Replication Code." DesignSafe-CI. https://doi.org/10.17603/ds2-jwf6-s535.

3. Schneider, F., J. Cordova Ortiz, D. Hondula, M. Wright, K. Turner, J. Vanos, A. Middel, D. Sailor, K. Kaloush, J. Medina, B. Campbell, E. Epel, B. Rice, R. Garcia. (2021) "Phoenix Cool Pavement Surface Reflectivity", in *City of Phoenix Cool Pavement Evaluation (COPE)*. DesignSafe-CI. https://doi.org/10.17603/ds2-a1nj-z717 v2

4.Villarreal, M. (2022) "Part 3: Planning Documents for Semi-Structured Interviews with Mexican Immigrant Women", in *Documenting the Undocumented: How Mexican Immigrant Women Navigate Long-Term Post-Disaster Housing Recovery and Cumulative Disaster Impacts*. DesignSafe-CI. https://doi.org/10.17603/ds2-5bm1-y393 v1

5. Wanting (Lisa) Wang and John W. van de Lindt, (2021) "Quantitative modeling of residential building disaster recovery and effects of pre- and post-event policies", International Journal of Disaster Risk Reduction, 59, 102259, https://doi.org/10.1016/j.ijdrr.2021.102259.

6. Watkins, L., M. Wright, P. Chakalian, E. Kurtz, D. Hondula, S. Harlan. (2021) "Hygrochron Temperature and Humidity iButton and Time Activity Diary - Wave 1", in *Personal Heat Exposure*. DesignSafe-CI. https://doi.org/10.17603/ds2-rakj-a122 v1

6. Watson, M., J. Semien, M. Meyer, R. Dudensing. (2022) "Business Survey", in *RAPID: Disparities in Business and Nonprofit Impact and Recovery from Hurricane Harvey, COVID-19, and Hurricane Laura*. DesignSafe-CI. https://doi.org/10.17603/ds2-1tam-rt83 v1

7. Womble, A., R. Wood, R. DeOtte, P. Hughes, M. Mohammadi, Y. Liao. (2020) "Hurricane Harvey Damage to Steel and Masonry Structures", in *Damage to Steel and Masonry Structures Following 2017 Hurricane Harvey in Texas*. DesignSafe-CI. https://doi.org/10.17603/ds2-mx4b-ng61 v1