DesignSafe: Introduction to DesignSafe, HazMapper, Potree, and QGIS

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A Cyberinfrastructure for the Natural Hazards Community

Slides courtesy of Ellen M. Rathje, Director, DesignSafe-ci, and Professor, University of Texas
What is DesignSafe?

- A web-based research platform that provides computational tools to manage, analyze, and understand critical data for natural hazards research

DesignSafe Vision

- A CI that is an integral part of research discovery
  - Support end-to-end research workflows and the full research lifecycle, including data sharing/publishing
  - Cloud-based tools that support the analysis, visualization, and integration of diverse data types
- Amplify and link the capabilities of the NHERI partners and natural hazards researchers around the globe

NHERI: Natural Hazards Engineering Research Infrastructure

- NSF-funded, shared-use research infrastructure to enable transformative research in natural hazards engineering
  - Network Coordinating Office (NCO)
  - Cyberinfrastructure (CI)
  - Seven shared-use experimental facilities (EF)
  - Natural hazards reconnaissance facility (RAPID)
  - Computational Modeling and Simulation Center (SimCenter)
DesignSafe Components

- Research Workbench
  - Data Depot
  - Workspace
  - Reconnaissance Portal
- Learning Center
  - Training resources and student engagement
- NHERI Facilities
  - Access to information about all NHERI facilities
- NHERI Community
  - News and online Slack community

Data Depot Features

- Different areas:
  - My Data (Private)
  - My Projects (Semi-Private, Collaborative)
  - Published (Publicly accessible, curated)
  - Community Data (Publicly accessible, uncurated)
- Upload files/folders via web browser, cloud service providers, or bulk transfer (Globus)
- Manage, preview files within Data Depot
- Data curation and publishing
Data Depot: Published Project

RAPID NHERI

Data Depot: Published Project

RAPID NHERI
Data Management Philosophy

- **Vision:** Allow users to easily store, share, document, and publish the data associated with their research, supporting the full data lifecycle
  - Focus on achieving community’s research goals
  - Flexible data models that support how researchers organize their data
- Different data models for different types of projects:
  - Experimental, Simulation, Hybrid Simulation, Field Reconnaissance, and Other

Workspace: Data analysis

The Workspace allows users to perform simulation codes including OpenSees as well as data analysis and visualization to Paraview and Visit.
Interactive Interface with Data

From Prof. S. Brandenberg, UCLA
Reconnaissance Portal

*Identifying Archived Datasets from Recon Events*

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**Data Workflow Concept**

1. **Scans**
   - Data Images
   - RAPID App
   - Metadata

2. **Surveys**
   - Data Images
   - Derived Data
   - Server

3. **GNSS**
   - Data Images
   - Metadata

4. **Drones**
   - Data Images
   - Messages

5. **Photos**
   - Images
   - Metadata

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**RAPID**

**NHRI**

**DESIGNSAFE-CI**
Recon Portal → Data Depot

HazMapper: Landslide Distribution

Interactive Map Viewer of Event Data
DesignSafe: Open for Business

www.designsafe-ci.org

- Capabilities available to the global natural hazards research community—account registration is free
- Training webinars
  - Overview webinars, as well as detailed training on Jupyter, etc.
  - Archived training webinars available at https://www.designsafe-ci.org/learning-center

Please share your feedback, ideas, experiences!

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