



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

Jeff Berman and Mahyar Sharifi

RAPID Facility Workshop
25 June 2018, Los Angeles, CA

NSF Award Number: CMMI 1611820



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

DESIGNSAFE-CI
NHRI: A NATURAL HAZARDS ENGINEERING RESEARCH INFRASTRUCTURE

Research Workbench • Learning Center • NHRI Facilities • NHRI Community • About • Help

Published PRJ-1293

PRJ-1293: LARGE-SCALE LABORATORY EXPERIMENTS OF WAVE IMPACTS ON VERTICAL CYLINDERS

PI Padgett, Jamie [View Team Members](#) DOI doi:10.17603/DS27D4G [Citation](#)

Date of Publication Sep/27/2017 Award NSF CMMI-1635115 & CMMI-1519679

Project Type Experimental Keywords storm surge, wave, aboveground storage tank, wave basin, hydraulic experiment

Description
Large-scale experiments at the Oregon State University Hinsdale Wave Research Laboratory to investigate wave impacts on vertical cylinders representative of aboveground storage tanks typical of petrochemical facilities located in coastal regions.

Experiment Large-Scale Laboratory Experiments of Wave Impacts on Vertical Cylinders

Large-Scale Laboratory Experiments of Wave Impacts on Vertical Cylinders

Authors Bernier, Carl, Lin, Yuxiang, Padgett, Jamie, Dawson, Clinton N., Lomonaco, Pedro, Cox, Daniel, DOI doi:10.17603/DS27D4G [Citation](#)

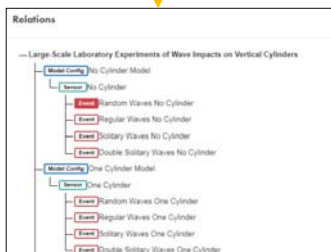
Experimental Q.H. Hinsdale Wave Research Laboratory, Oregon
Facility State University

Experiment Type Wave
Equipment Type Directional Wave Basin (DWB)
Date of Publication Sep/27/2017

Description
Large-scale laboratory experiments of wave impacts on vertical cylinders representative of aboveground storage tanks typical of petrochemical facilities located in coastal regions. The objective is to provide a dataset for validation of numerical or analytical models of wave impacts on cylindrical

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Data Depot:
Published
Project



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Large-scale laboratory experiments of wave impacts on vertical cylinders representative of aboveground storage tanks typical of petrochemical facilities located in coastal regions. The objective is to provide a dataset for validation of numerical or analytical models of wave impacts on cylindrical structures. Four types of waves are considered: (i) regular or monochromatic waves, (ii) random or irregular waves, (iii) solitary waves, and (iv) double solitary waves. Three different configurations (models) of the experiment are investigated: (i) a single cylinder, (ii) two cylinders in tandem, and (iii) no cylinder or undisturbed case. Pressure and wave setup are recorded on the cylinders, while wave height and water velocity are recorded around the cylinders.

Event Data: Random Waves No Cylinder [Link to Model Configuration Sensor List](#)

Name	Size	Last modified
Intermediate Data - Random0		
Raw Data - Random0		
Log - Random0		
Random0 log.pdf	63.7 KB	

Event Data: Random Waves One Cylinder [Link to Model Configuration Sensor List](#)

Name	Size	Last modified
Intermediate Data - Random1		
Raw Data - Random1		

RAPID NHRI

Interactive Interface with Data



Please click on "Cell" and then click on "Run All" to read the interactive data report.

Click here to show/hide the code

Data Report: Centrifuge Testing of a Circular and a Rectangular Embedded Structure During Base Shaking

Elnaz Ermiestadon Seylali¹, Eva Agapari², Dimitris Pitasas³, Scott J. Brandenburg⁴, Jonathan P. Steward⁵, and Efthymos Todorogi⁶

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²Civil & Environmental Engineering Department, University of California, Los Angeles, CA 90095
³Department of Civil Engineering, Aristotle University of Thessaloniki, 54124, Thessaloniki, Greece

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 Professor, jsteward@ucla.edu
 Professor, etodor@ucla.edu (Principal Investigator)

1 Introduction

Seismic response of underground structures is a complex soil-structure interaction (SSI) problem in which two fundamental mechanisms are at play. Kinematic SSI is concerned with the motion of the structure in the presence of spatially variable ground motions and the interface pressures that develop as a result of different structural and free-field motions. Inertial SSI captures the soil reactions that develop to resist inertial forces associated with the acceleration of the structure. The kinematic component is generally considered to be more significant for buried structures, due to their modest mass and their confinement with the surrounding soil.

From Prof. S. Brandenburg, UCLA



Interactive Interface with Data



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1 Introduction

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7 Interactive data plotter

The following interactive data plotter shows the measured signals of all of the sensors in each event, in the prototype scale.

select shake event: 18_31152016q094200@136959@45 from 20_31152016q094200@14370@45 from 21_31152016q094200@14541@45 from 22_31152016q094200@15145@45 from 23_31152016q094200@16231@45 from 24_31152016q094200@16314@45 from 25_31152016q094200@16411@45 from

select sensor: HE HA AZ25 AD18 AD19 AC13

AZ25

Acceleration (g)

Time (s)

From Prof. S. Brandenburg, UCLA



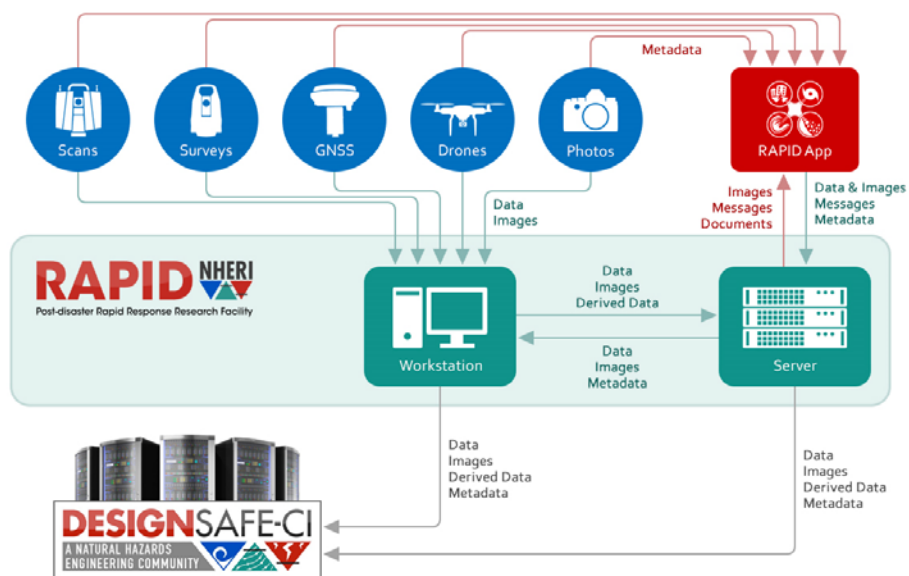
Reconnaissance Portal

Identifying Archived Datasets from Recon Events

The screenshot shows the Reconnaissance Portal interface. On the left, there is a sidebar with the 'Recon Portal' logo and a 'Back to results' link. Below this is a thumbnail image of a landscape. The main content area displays the title '2016 Kaikoura Earthquake' with the location 'Kaikoura, New Zealand' and the date '2016-11-14'. Underneath, a section titled 'Available datasets:' lists three items: 'Kaikoura Earthquake Reconnaissance', 'Kaikoura Earthquake Reconnaissance Report', and 'Landslide Inventory'. The 'Landslide Inventory' item is highlighted with a yellow box. To the right of the text is a satellite map of New Zealand with a blue location pin on the east coast.



Data Workflow Concept



Recon Portal → Data Depot

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Published: PRJ-1699

PRJ-1699: KAIKOURA EARTHQUAKE LANDSLIDE INVENTORY

PI: Rathje, Elen New Team Members DOI: doi:10.17603/DS2508W Custom

Date of Publication: Oct 16/2017 Award: CMB-1300744

Project Type: Other Keywords: Kaikoura earthquake, landslides, earthquake

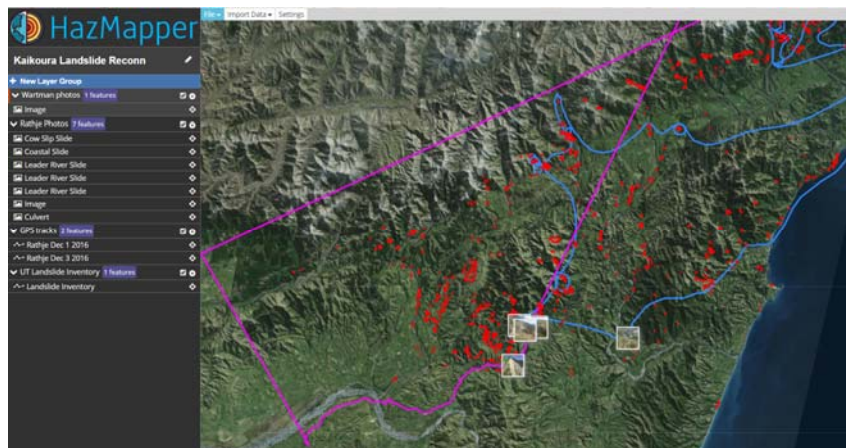
Description
 The Mw 7.5 Kaikoura, New Zealand earthquake occurred on November 13, 2016 and induced significant landslides across the mesoseismic area. The Geotechnical Extreme Events Reconnaissance (GEER) Association organized a reconnaissance team to investigate the event, and part of that team was focused on the landslide effects. The GEER team assessed the spatial distribution of landslides rapidly after the earthquake using available optical imagery and visual identification techniques. The goal was to develop within days a detailed landslide inventory that could be used to guide response and reconnaissance efforts. This project contains the developed landslide inventory and describes the process used to create the inventory. The project contents are summarized in the README file.

Name	Size	Last modified
Landslide Inventory -- GEOUSON	--	10/18/17 9:55 AM
Landslide Inventory -- KMIL (Google Earth)	--	10/18/17 9:55 AM



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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