DESIGNSAFE-CI

A NATURAL HAZARDS ENGINEERING COMMUNITY

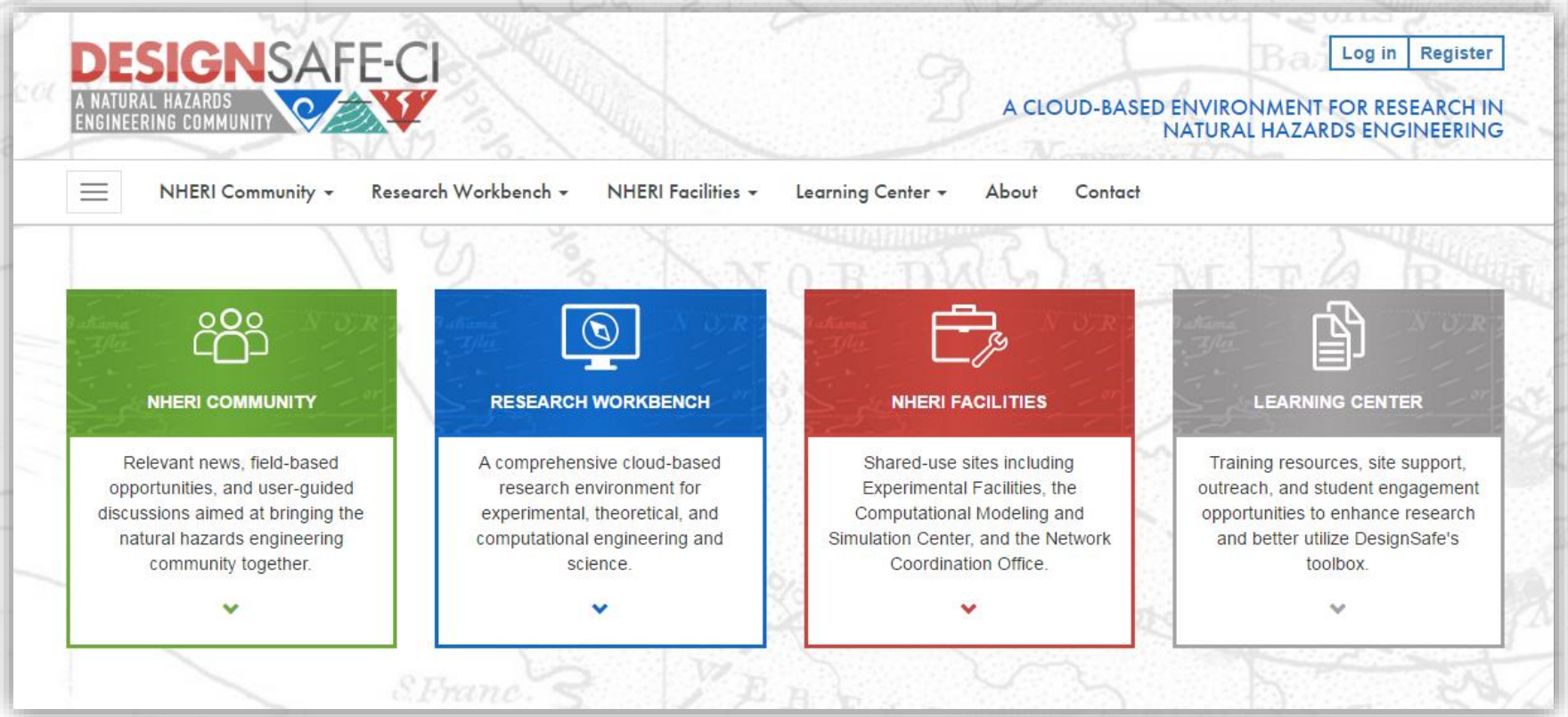
Updates to Experimental Facilities
May 2016

DESIGNSAFE-CI A NATURAL HAZARDS ENGINEERING COMMUNITY | TEXAS The University of Texas at Austin | TACC | RICE | Florida Tech

Meeting Goals

- Summarize currently available DesignSafe functionalities
- Summarize Data Curation activities and plans for development of end-to-end data management tools
- Identify action items for assistance to EFs regarding data upload for current projects, training and testing duration curation tools, etc.
  - How can we help you with your upcoming site visits?

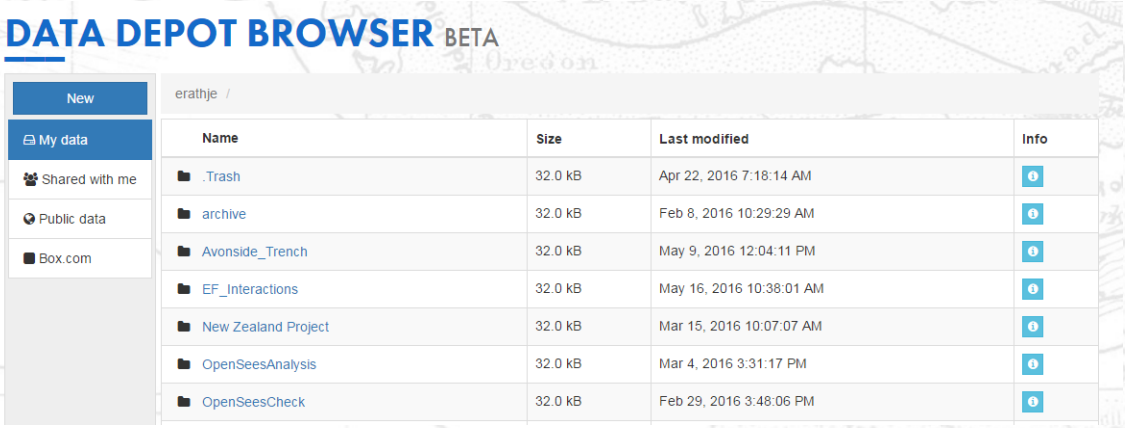
DesignSafe Release 1: March 2016



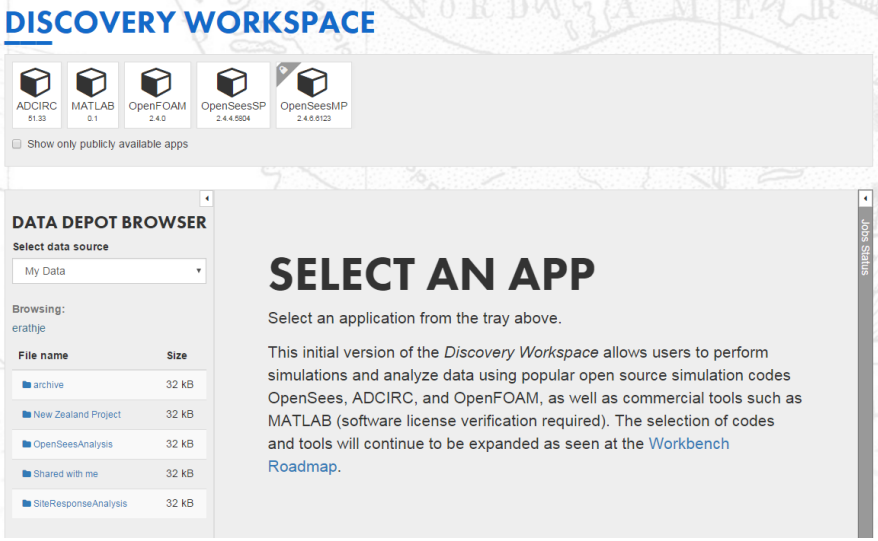
DesignSafe Research Workbench

- Data Depot
  - Data upload and sharing, file/folder management
  - Box integration is coming very soon for bulk upload
  - Data Depot includes NEES project data
- Discovery Workspace
  - OpenSees, ADCIRC, OpenFOAM, Matlab available
  - Jupyter notebook available soon (40+ languages supported including Python, R, and Matlab emulator)
- Developer's Portal
  - Information on data upload, file management via CLI and APIs

Login to *DesignSafe* and try it out!



Box.com integration coming by June 6!



Jupyter notebooks coming soon!

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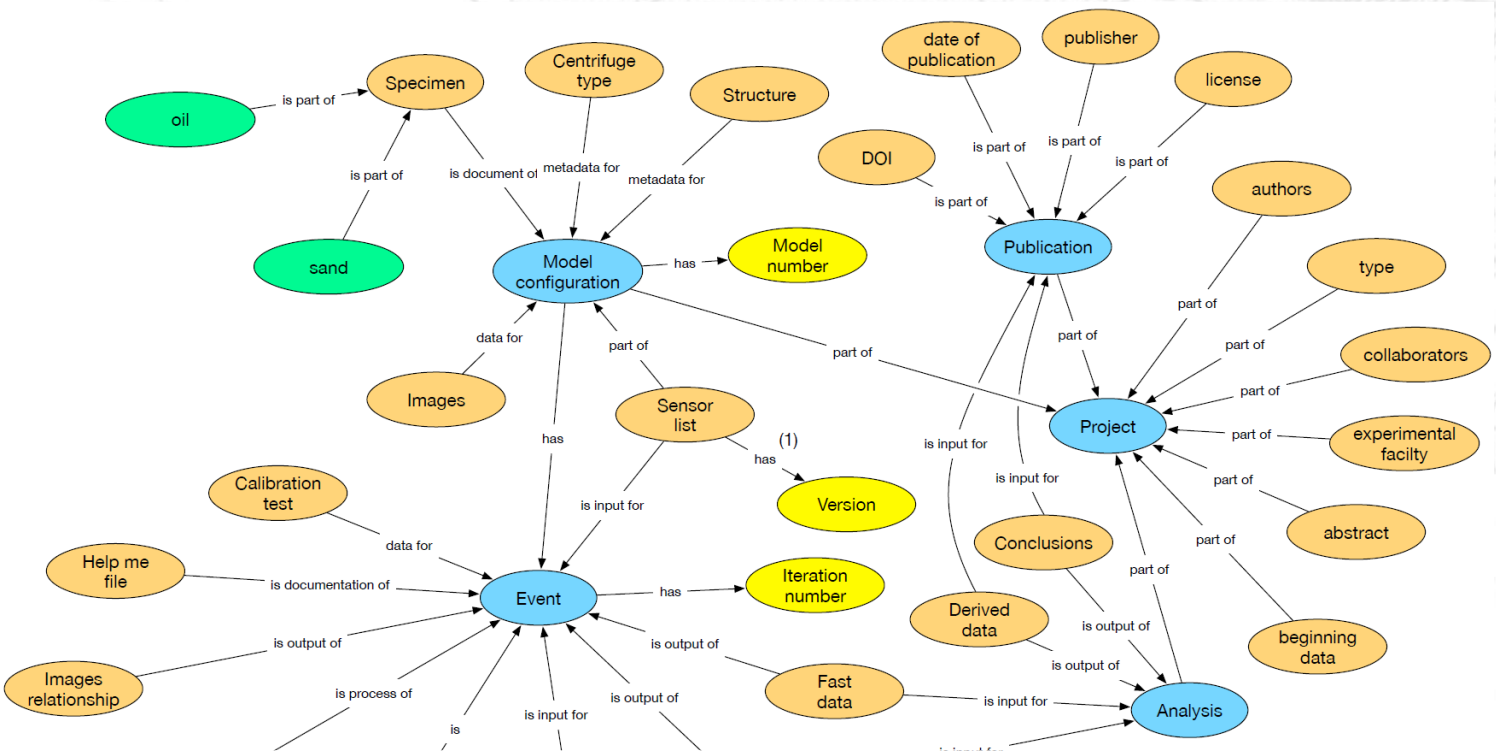
DesignSafe Data Curation

- Developing EF-specific data models and vocabularies



DesignSafe Data Curation

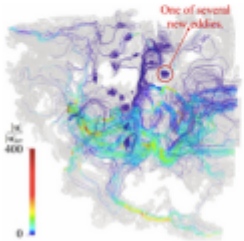
- Developing end-to-end data management infrastructure
  - Project creation
  - Linking to specific EF (allows EF to access the project)
  - Automatic population of metadata tags/tagging of files
  - Sharing with collaborators
  - Final publication of dataset and assignment of DOIs

Enhanced View of Published Data

Digital Rocks Portal
https://pep-dev.tacc.utexas.edu

Estaillades Carbonate

Project | Publications



Description

The effect of pore-scale heterogeneity on non-Darcy flow behaviour is investigated by means of direct flow simulations on 3-D images of Estaillades carbonate. The critical Reynolds number indicating the cessation of the creeping Darcy flow regime in Estaillades carbonate is two orders of magnitude smaller than in Bentheimer sandstone, and is three orders of magnitude smaller than in the beadpack. It is inferred from the examination of flow field features that the emergence of steady eddies in pore space of Estaillades at elevated fluid velocities accounts for the early transition away from the Darcy flow regime.

Further details can be found in Muljadi et al., Advances in Water Resources (2015), URL:http://dx.doi.org/10.1016/j.advwatres.2015.05.019

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Created
Sept. 28, 2015

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Cite this project
http://dx.doi.org/10.17612/P73W2C

Datasets

- Sample: Estaillades Carbonate
  - Origin Data: Estaillades image (version 1)
  - Origin Data: Estaillades image (version 2)
    - Analysis Data: Velocity in X — Forchheimer regime
    - Analysis Data: Velocity in Y — Forchheimer regime
    - Analysis Data: Velocity in Z — Forchheimer regime

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Current Activities with EFs

- Developed Data Management Guidelines for ENH proposals
- Managing EF websites associated with DesignSafe
- Helping Lehigh upload data to TACC file system
- Helping Florida and Texas develop visualizations of data
- Working with UC Davis and National Instruments to interface NI tools with DesignSafe

Things Open for Business

- **Cybersecurity -** The Cooperative Agreements have a security "audit" deliverable in them – at this point this is mostly a conversation and a review of docs you send to NSF. We've done this with one EF, and are happy to work with you at any time for yours.
- **Data Upload –** Data can be brought in via Box, via scripts in our API, manually, or a variety of other methods. If you need to bring in data of any type – into the workspace, local backups, scratch data, schedule some time to talk with us and let's get started!
- **Visualization –** This is largely custom development, but we are happy to take a crack at your data and begin building then integrating visualizations – in progress at two sites.

Things Open for Business (2)

- **Computation access -** We are providing direct access to large scale computing resources for those who need them. If you need accounts, or tools installed or configured, please contact us about that.
- **Tool Integration–** Running a bit of a backlog now, but we are starting to add large numbers of new tools to the Discovery Workspace – if you have needs, please get these requests in, and we will get to them ASAP (probably several weeks right now, will catch up in the summer).
- **Finalize Required Elements of Schemas –** Sometime late in the year, we will turn on some mandatory checks. If there are elements of metadata projects using your facility *must* provide, please coordinate with Maria!

Proposed Action Items with EFs

- Identify an experiment taking place soon that you will use as an initial trial with DesignSafe
  - Data upload and sharing via Data Depot
- Provide feedback on EF-specific data models/ vocabularies to Maria Esteva
- Translate a processing script to Jupyter so processing can take place in the cloud
  - Scott Brandenberg doing this for UC Davis
- Identify visualization needs for your data