Overview of the Joplin Tornado Repository

February 20, 2018
NCST Advisory
Committee Meeting

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Introduction - Disaster and Failure Studies Data Repository

- The repository contains a compilation of images, videos and documents collected during and after disaster and failure events studied by NIST, as well as data generated from research on those events. The materials in the repository serve as an historical archive.
- The repository is also a tool for research, and analysis of disaster data and information related to performance of the built environment, emergency response procedure, and other technical, social, and economic factors

Development History

- **Phase 1: World Trade Center Investigation**
  - **Built on Gallery 2 / MySQL** - an open source platform that supports browsing and downloading the multitude of image and video file types
  - **Published August 2011**
    - » **http://wtcdata.nist.gov/**
- **Phase 2: Pilot repositories using new database technology**
  - **HUBzero® Platform** – an open source software package used to create web sites called “HUBs” that are used for research, education, and online collaboration
  - **2010 Chile Earthquake Repository, published April 2016**
    - » **https://disasterhub.nist.gov/**
  - **2011 Joplin Tornado Repository, nearing completion**
  - **2013 Newcastle-Moore Tornado Repositories, in development**

Pilot HUB Data Types

- **Chile EQ Repository**
  - Photographs, Building Plans, Building Characteristics
  - Ground Motion Records, Structural Analysis input files
  - All repository data available to the public
- **Tornado Repositories – all records from NIST studies**
  - Photographs, Building Plans, Building Characteristics
  - Gridded estimates of peak wind speeds, modeled wind speed and direction time histories
  - Videos, Audio files
  - Maps, Reports, Other documents

However, some records NOT public, e.g.,

- Investigator notes files
- Records containing personally identifiable information
- Records where owners did not provide permission

Additional Requirements for Tornado Repositories

Two HUBs for each event

- **Internal HUB:**
  - For NIST Investigators only, used by NIST to create, update, analyze, compare disaster data repositories
  - "Tagging Tool" for uploading and annotating repository files
  - All data – both unrestricted and restricted (data not for public view)
  - Process for transferring unrestricted data to Public HUB
- **External (Public) HUB:**
  - Unrestricted data for public view, search, and exploration
  - Linked from NIST Disaster and Failure Studies web page

The Public versions of the Chile and Tornado Repositories will have a similar look and feel

Progress Since 2015 NCST AC Mtg (1/2)

System Improvements

- Completed “Tagging Tool” for NIST user uploading and annotating of repository files
- Implemented system for logging all changes to the database
- Completed development of automated process for transferring unrestricted data from Internal HUB to Public HUB
- Developed documentation for end-to-end process of creation of HUB, data upload and tagging, and data management

Progress Since 2015 NCST AC Mtg (2/2)

Joplin Repository

- Developed system to display gridded estimates of wind speed within OpenStreetMap®
- Created internal and draft of public facing HUBs in the new system architecture
- Developed User Manual

Newcastle-Moore Repository

- Created initial version of internal HUB
- Initial upload and tagging of data completed

Creation of the initial draft version of the Newcastle-Moore repository provided an end–to-end test of entire revised HUB system

Draft Joplin Tornado Landing Page

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NIST Disaster and Failure Studies HUB

You are here: Home / Resources / Downloads / The 2011 Joplin Tornado Data Repository / About

The 2011 Joplin Tornado Data Repository

About | Supporting Docs

Category

Downloads

Abstract

Following the May 22, 2011 tornado that struck Joplin, Missouri, the single deadliest tornado since official records began in 1950, the National Institute of Standards and Technology (NIST) launched an investigation to study the impacts of the disaster and make recommendations based on the findings of the investigation, as warranted, for improvements to codes, standards and practices related to the design and construction of buildings and to emergency communications.

This database has been created to supplement the NIST Joplin Tornado Study Report of their investigation and findings, found here. It is hoped that the public and researchers will use this data to help minimize the damage and loss of life in future tornadoes. It includes photographs, videos, maps, reports, drawings, and other documents related to meteorological conditions, warnings, and performance of buildings and other structures affected by the tornado.

A Joplin resident explains her experiences during the tornado to a NIST team member (left).

Explore Joplin Data with Tables ...

Click on the DataViews to browse and search data for buildings and locations damaged by the Joplin tornado:

- Buildings DataView displays data for Joplin buildings.
- Locations DataView displays data for Joplin neighborhoods, streets, counties, street signs and buildings.

How to use DataViews to Explore Joplin Data. Learn the best ways to find what you want -- read How to navigate and explore with DataViews

How to navigate and explore with DataViews

Data in the Joplin repository is viewed, searched and explored through DataViews. Here's how...

Filter on columns to find what you want: Search for specific values by using the column filter box. You can filter on more than one column to search for the rows you want.

Click in the box	for a list of all values in the column
Type text in the box	for a Google-like search of column values
Click on the x	to remove your filter text
Hover over the box	for a description of all filtering options

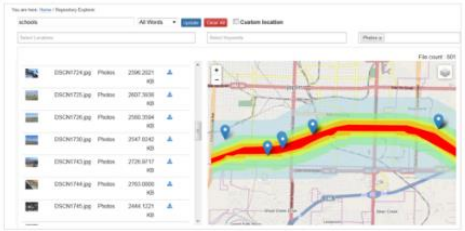
Use Clear Filters to start your search over. The Clear Filters button is at the top of the DataView and is used to clear all your search selections from the column filter boxes.

Download data to your desktop. Download any data view as a spreadsheet by clicking on the Download button at the top of the DataView. Individual files (photos, drawings, audio, videos, etc.) can be downloaded in any DataView by clicking on the file name.

Select columns for a personalized DataView. Click on Customize View at the top of the DataView and select the columns you want in your DataView. Then click Launch Custom View.

In the Buildings DataView, type "school" in the Building Name column filter box to find Joplin schools damaged in the tornado

Explore the Joplin Repository with Maps ...



Click on the Repository Explorer to help you explore and understand reconnaissance data collected by NIST to investigate damage caused by the Joplin tornado.

Use maps, addresses and text searches to find photos, drawings, and documents for all the damaged areas in Joplin that you are interested in.

The Repository Explorer lets you select map regions or specific map locations for searching. Or you can enter location names, addresses, keywords and descriptions to browse and investigate the repository.

Next Steps

Joplin Repository

- Review and QC the entire repository dataset
- Verify transfer system integrity, that only data having appropriate permissions is being transferred to the draft external HUB
- Lab Review
- Legal Review
- Final IT Security Review
- Transfer Repository to External HUB

Newcastle-Moore Repository

- Develop Landing Page
- Develop User Manual
- All of the tasks identified for Joplin

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Questions?

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