



NCST Investigation of the Champlain Towers Collapse

Judith Mitrani-Reiser, Lead Investigator
Glenn Bell, Associate Lead Investigator
David Goodwin, NCST Investigator
James Harris, NCST Investigator
Youssef Hashash, NCST Investigator
Georgette Hlepas, NCST Investigator
Ken Hover, NCST Investigator
Scott Jones, NCST Investigator
Jack Moehle, NCST Investigator
Sissy Nikolaou, NCST Investigator
Fahim Sadek, NCST Investigator
Kamel Saidi, NCST Investigator
Chris Segura, NCST Investigator
Jonathan Weigand, NCST Investigator

Response effort after building collapse

Source: NIST



First specimens
of *building
evidentiary
debris* are
extracted days
after collapse



Source: NIST

Press Conference on June 30, 2021 announcing launch of NCST investigation



James K. Olthoff

Performing the non-exclusive functions and duties of NIST Director

Source: NIST



1. INCIDENT NAME:
Champlain Towers
Building Collapse

2. DATE PREPARED:
7/01/2021

3. TIME PREPARED:
2000 hrs

EVIDENTIARY RUBBLE HANDLING PROCEDURE

**NIST coordinates
evidence
identification and
handling procedures
with the Incident
Command**



Source:
Miami-Dade
County, NIST



**NIST
engineers
help identify
evidence
from a safe
distance**

Source: NIST

An aerial photograph showing a large-scale demolition project in an urban setting. In the center, a rectangular area is filled with rubble and debris, with several excavators and trucks working on it. To the left, a tall, modern, curved high-rise building stands prominently. To the right, there are several other multi-story apartment-style buildings. The foreground shows a sandy beach area with some temporary structures and equipment. The background includes more city buildings and greenery.

**Experts from NSF, FSU,
Miami-Dade Fire Rescue, and
VA Beach Fire Dept. support
remote sensing activities**

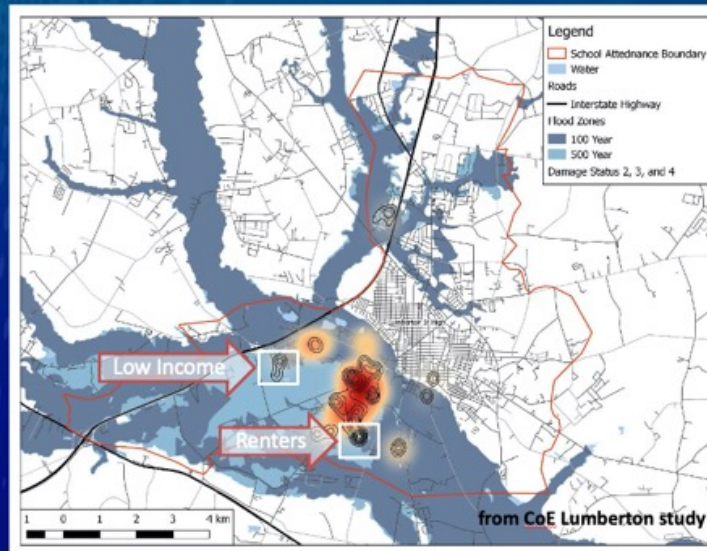
Source: NIST

NCST AC Meeting, September 2017

Team Readiness:
post-event
reconnaissance
enhanced by drones

Disaster and Failure Studies (DFS) Program Overview: Research Arm

Heat maps indicating damage
and
contours indicating dislocation



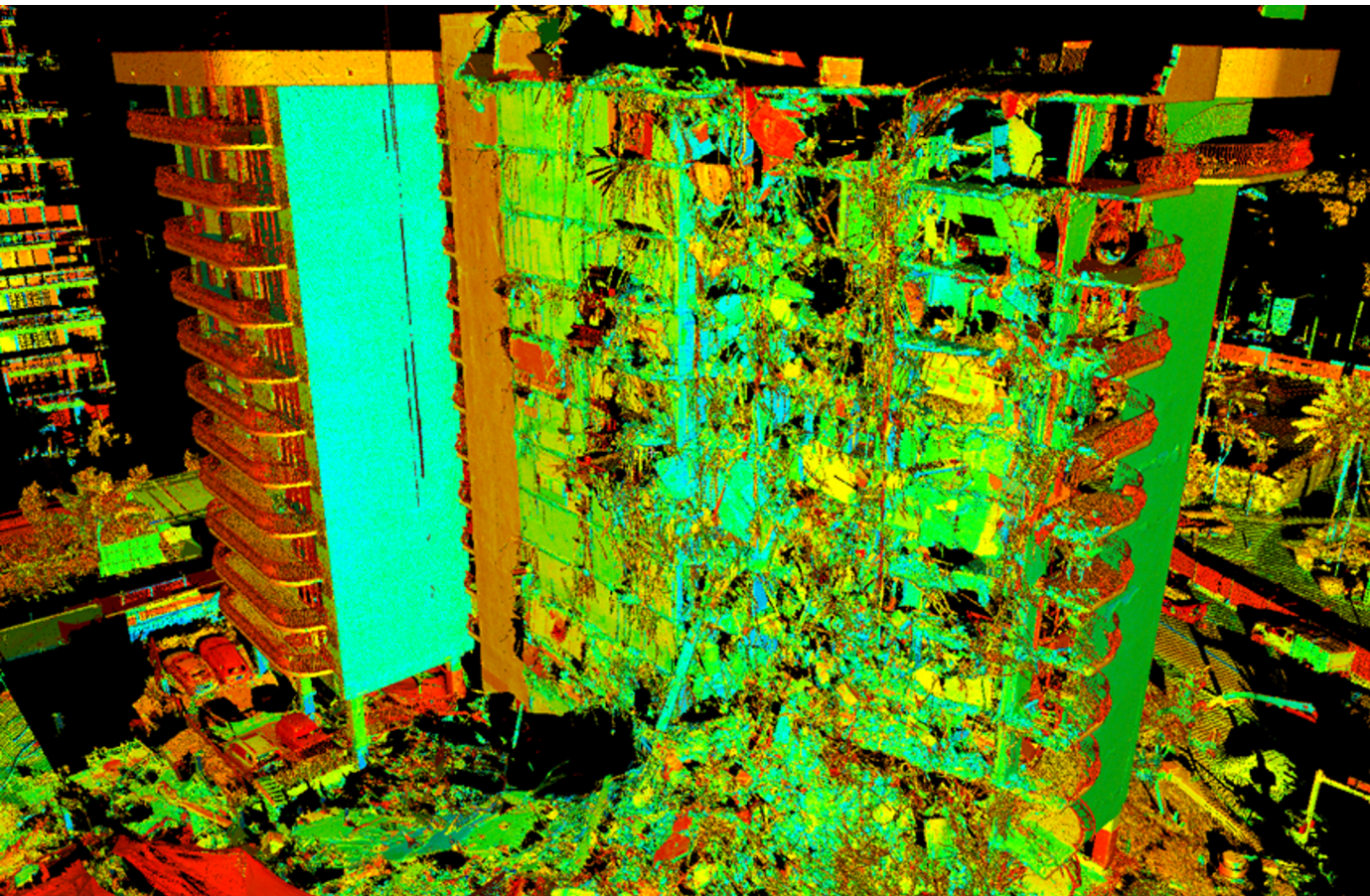
NIST funds UC San Diego on use of UAV Swarms for
Post-Event Damage Data Collection



Summer students explore best practices in
sampling protocols (figure by [Prevatt et al., 2012](#)).



engineering laboratory

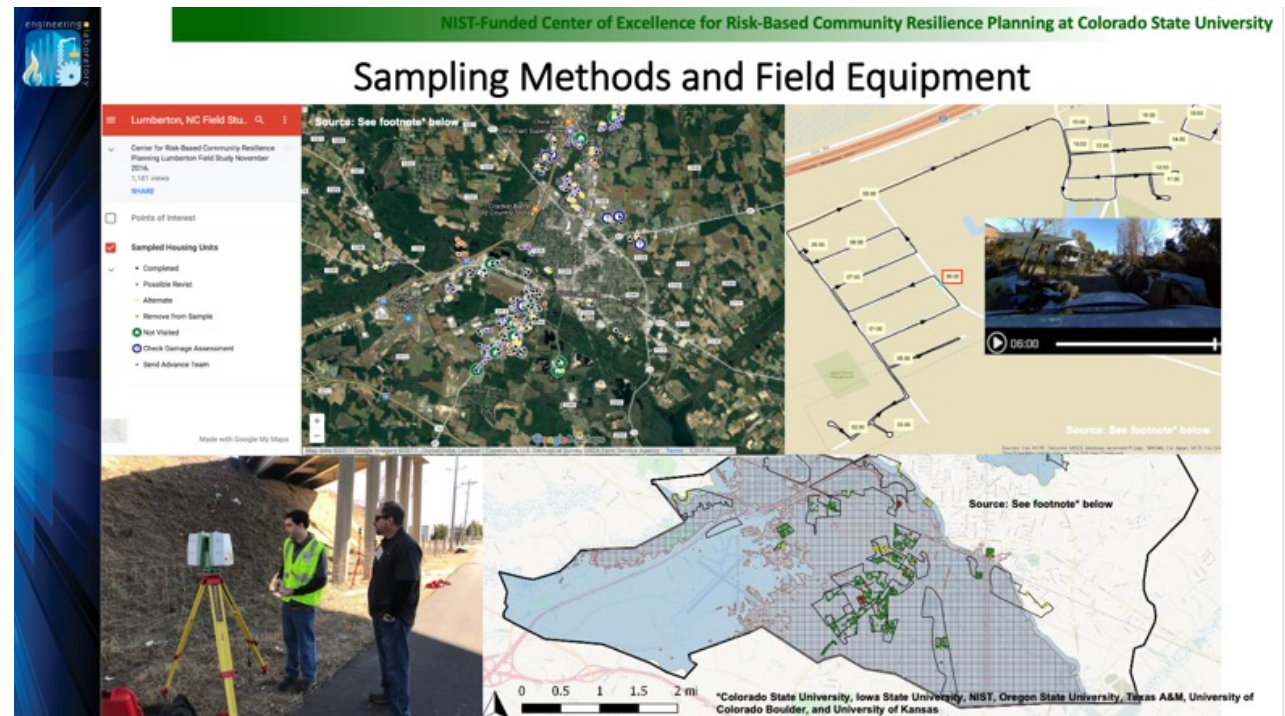


Experts from FEMA, NSF, USGS, and USACE support remote sensing activities.

Source: NSF, NIST

NCST AC Meeting, August 2018

**Team Readiness:
post-event
reconnaissance
enhanced by GIS-
based platforms and
remote sensing
equipment**



NIST establishes evidence tagging protocols with first responders



Source: NIST

DISASTER & FAILURE STUDIES

Champlain Towers South Collapse

News and Updates

Projects

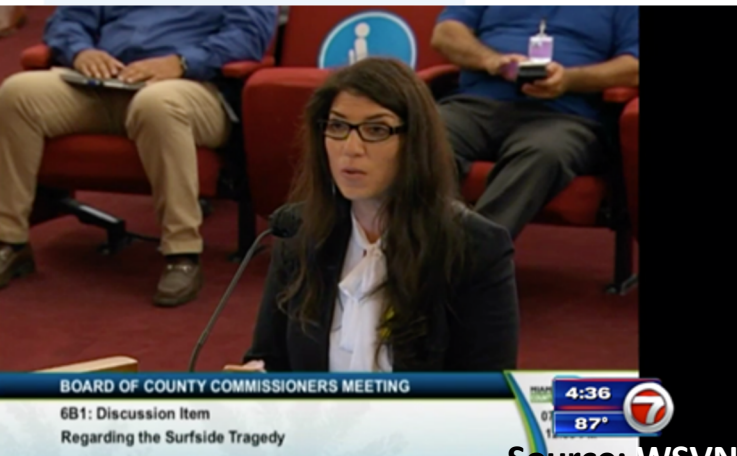
National Construction
Safety Team

Champlain Towers South Collapse

NIST encourages members of the public to submit any information, including video, photos or other documentation, that might help the investigation via the [NIST Disaster Data Portal](#)

Data Portal for the NIST Disaster and Failure Studies Program

At this time NIST is only accepting information/data (including photos, videos, and other documentation) from authors, creators and/or copyright owners. If you want to submit information/data but did not yourself write or create the material (for example, you did not take a photograph yourself but got it from someone else) or are not the copyright owner, please contact the Disaster and Failure Studies Program at Disasters@nist.gov. Please submit a description of the information/data; do not submit information/data itself to this email address.



NCST AC Meeting, Sept 2019

NCST investigations
enhanced by
proactive data ingest
and data storage
tools

EL Data, Security, & Technology (ELDST)

IT Security & Privacy:
Carolyn Rowland & Andrew Mundy

Cloud services configuration & training:
Carmen Martinez

Public data collection portal:
Carmen Martinez, Tzong Hao Chen

NIST

Data Portal for the NIST Disaster and Failure Studies Program

*Required

Description of data to be uploaded *

Your answer

Contact information for copyright owner submitting information:

GRANTING OF YOUR PERSONAL INFORMATION
By the above permission to file, including the Freedom of Information Act (FOIA), NIST will not share your personal information without your permission. We do not sell your

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Grant Permissions

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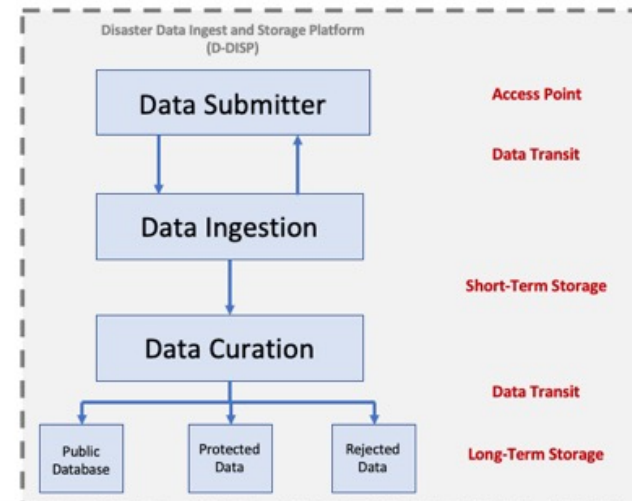
☐ Yes

☐ No

Published in Study Reports, Briefings, or Presentations *

NIST may include my work in the study reports, briefings, and presentations, if needed as specified above. I understand and agree that reports, briefings, and presentations may be made available to the public in several forms, including but not limited to: (a) traditional print media, available for as long as copies of the report are requested; and (b) electronic or other media, such as a PDF, on a NIST website or otherwise. My work in a report, briefing, or presentation made available under (b)


Disaster Data Ingest and Storage Platform (D-DISP)



NIST waited for collapsed site to be cleared, dewatered, and safe before entering.

Source: NIST





NIST conducts visual inspection and non-destructive testing of slab, with USACE



Source: NIST



NIST conducts a subsurface investigation, with USACE and Disaster Resilience Research Grant Awardee (GAtech)

Source: NIST

NCST AC Meeting, Sept 2019

Post-event
reconnaissance
enhanced by
accounting for
uncertainties
introduced in field
data collection

engineering
technology
(used with permission from Prof. Kuester)

Disaster Resilience Grants



Improving Disaster Resilience Through Scientific Data Collection with UAV Swarms

Award # 70NANB17H211 to the University of California, San Diego

Researchers: Falko Kuester (PI), Tara C. Hutchinson, Kevin W. Franke,
Timothy W. McLain, and Nicholas A. Dembsey



NIST has awarded more than \$6.6 million to study ways buildings can be made more resilient to hazards such as the 2011 Joplin tornado that destroyed this large store.

The Georgia Tech Research Corporation on behalf of Georgia Tech (\$699,000)

To conduct research and develop analysis methods for improved damage assessments following a disaster, accounting for data uncertainty, differences in structures and hazard characteristics, and the performance of "lifelines" such as power, water, communications and wastewater systems.

Texas Tech University (\$667,000)

To develop innovative methods for measuring and modeling short-term and long-term social and health effects of windstorms and their impact on the built environment.

NIST's investigation will include recommendations to improve the safety and structural integrity of buildings



NIST announces investigative team on Aug 25th

NIST



Champlain Tower NCST Investigation

Judith Mitrani-Reiser, Lead Investigator
Glenn Bell, Associate Lead Investigator



Project One: Building and Code History

Leads:
**Jonathan
Weigand (NIST)**

**James Harris
(Consultant)**

Project Two: Evidence Preservation

Leads:
**David Goodwin
(NIST)**

**Chris Segura
(NIST)**

Project Three: Remote Sensing Analysis

Leads:
**Kamel Saidi
(NIST)**

**Georgette Hlepas
(USACE)**

Project Four: Materials Science

Leads:
**Scott Jones
(NIST)**

**Ken Hover
(Cornell)**

Project Five: Geotechnical Engineering

Leads:
**Sissy Nikolaou
(NIST)**

**Youssef Hashash
(Consultant)**

Project Six: Structural Engineering

Leads:
**Fahim Sadek
(NIST)**

**Jack Moehle
(UC Berkeley)**

NCST AC Meeting, June 2021

NCST investigations enhanced by proactive data management procedures

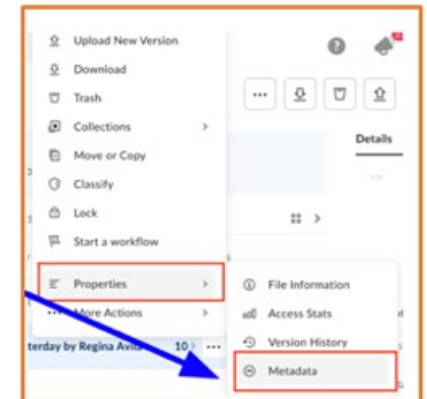


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Investigation Data Procedures

The Solution:

- Steps to ensure data is findable, such as:
 - Organizing data using various platforms for collaboration (e.g., Google Drive, Box, Zotero)
 - Documenting data with metadata templates
 - Creating README files
 - Documenting curation guidelines
- Steps to address data sensitivity, such as:
 - Privacy Impact Assessment of data system
 - Employ platform features, e.g., Classifying data and access permissions in Box
 - Guidance on Tagging/Handling Personally Identifiable Information (PII) in Collected Files



**COLLABORATE
COORDINATE
COOPERATE**

NIST Engineering Laboratory

Structures Group (MSSD)
Infrastructure Materials Group (MSSD)
Earthquake Engineering Group (MSSD)
Community Resilience Group (MSSD)
Intelligent Systems Division
Fire Research Division
EL Data, Security, Technology Group
EL Applied Economics Office

NIST

Physical Measurement Laboratory
Materials Measurement Laboratory
Public Affairs Office
Office of Chief Counsel
Program Office
Management and Organization Office
Acquisition & Agreements Mngmt. Office
Grants Management Division

Federal

Federal Emergency Mngmt. Agency
U.S. Army Corps of Engineers
U.S. Geological Survey
National Science Foundation

Local and State

Miami-Dade County Mayor's Office,
Fire, Police, and Building Departments
Town of Surfside
City of Miami Beach
Florida Department of Emergency Mngmt.
Florida Department of Transportation
Virginia Beach Fire Department
USAR Task Forces

Thank you

Judith Mitrani-Reiser, Ph.D.
judith.mitrani-reiser@nist.gov

*Lead Investigator, Champlain Towers NCST Investigation
National Institute of Standards and Technology
U.S. Department of Commerce*