



DFS Updates on Enhancing the Readiness of Teams

Sept 06, 2019
NCST Advisory
Committee Meeting

Judith Mitrani-Reiser, Ph.D.
*Director, Disaster and Failure Studies Program
Team Member, Hurricane Maria NCST Investigation
National Institute of Standards and Technology
U.S. Department of Commerce*

NIST's Disaster and Failure Studies Program

Statutory Thrust

- Evaluate hazard events against deployment criteria
- Manage identification, vetting, and onboarding of NCSTAC members
- Develop agenda, manage logistics, and set frequency for NCSTAC meetings
- Create annual NCST reports to Congress
- Coordinate statutory activities across programs related to disasters.
- Conduct field studies under various authorities

Procedures Thrust

- DFS SOP
- HOT Team membership, training, and credentials
- Field and safety protocols
- Human subjects protocols
- Manage equipment for disaster metrology and personnel protection
- Data preservation, security, and management plan
- Field tools (NDA's, permissions, survey inst.)
- MOUs with other agencies, academics, and others
- NIST Disaster Working Group

Research Thrust

- Research program focused on disaster metrology, including structural performance and social sciences
- Coordinate research activities with NIST EL Groups, disaster statutory programs, NIST EL Divisions, and other NIST Labs
- Coordination with the Center of Excellence of Risk-Based Community Resilience Planning on field studies
- NIST's Disaster Resilience Grants Program
- Outreach and dissemination



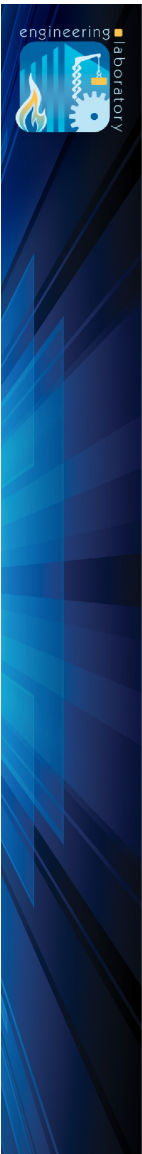
NIST's Disaster and Failure Studies Program

Statutory Thrust

- Evaluate hazard events against deployment criteria
- Manage identification, vetting, and onboarding of NCSTAC members
- Develop agenda, manage logistics, and set frequency for NCSTAC meetings
- Create annual NCST reports to Congress
- Coordinate statutory activities across programs related to disasters.
- Conduct field studies under various authorities

Procedures Thrust

Research Thrust



| Disasters Scored in FY18 | | | |
|--------------------------|--|-------------------------|-----------------------------|
| Date | Event | Event Consequence Score | Evacuation & Response Score |
| 09/17/18 | Hurricane Florence (North Carolina)* | 3.6/5.0 | 2.0/5.0 |
| 08/25/18 | Hurricane Lane (Hawaii) | 2.0/5.0 | 1.0/5.0 |
| 08/05/18 | Loloan Earthquake (Indonesia) | 3.4/5.0 | 2.9/5.0 |
| 07/30/17 | Carr WUI Fire (Redding, CA) | 2.5/5.0 | 3.0/5.0 |
| 07/23/18 | Greek WUI Fires (Kineta, Mati, and Rafina) | 2.8/5.0 | 3.2/5.0 |
| 07/23/18 | Apartment Building Collapse (Miami Beach, FL) | 3.0/5.0 | 1.0/5.0 |
| 05/04/18 | Leilani Estates Earthquake (HI) | 3.0/5.0 | 3.0/5.0 |
| 05/01/18 | Fire Induced Building Collapse (São Paolo, Brazil) | 3.6/5.0 | 3.6/5.0 |
| 03/15/18 | FIU Pedestrian Bridge (Miami, FL) | 4.2/5.0 | 3.0/5.0 |
| 12/28/17 | Bronx Apartment Fire (New York City, NY) | 3.0/5.0 | 2.0/5.0 |
| 10/09/17 | Tubbs Fire (Santa Rosa, CA)* | 4.7/5.0 | 5.0/5.0 |

*NIST deployed a team

NIST's Disaster and Failure Studies Program

Statutory Thrust

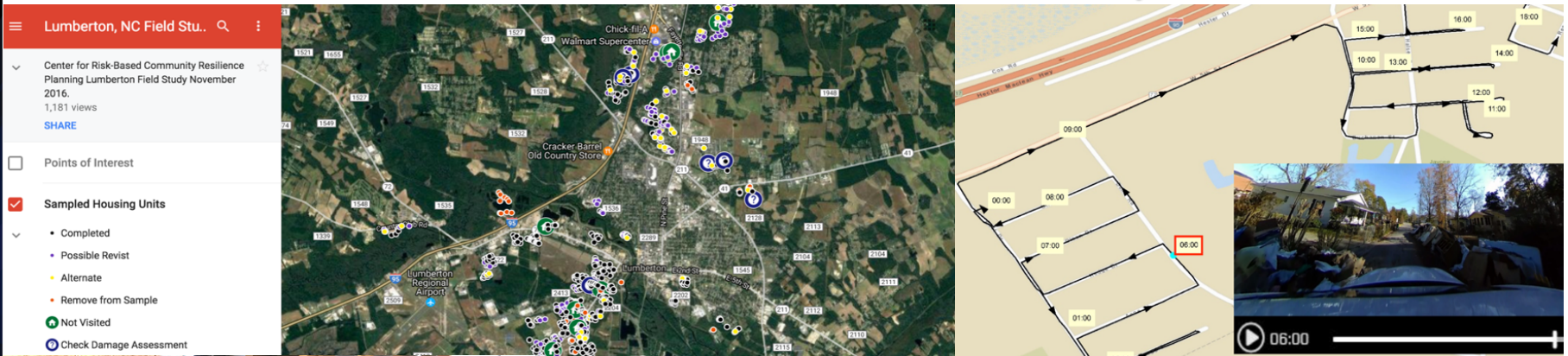
- Evaluate hazard events against deployment criteria
- Manage identification, vetting, and onboarding of NCSTAC members
- Develop agenda, manage logistics, and set frequency for NCSTAC meetings
- Create annual NCST reports to Congress
- Coordinate statutory activities across programs related to disasters.
- Conduct field studies under various authorities

Procedures Thrust

- DFS SOP
- HOT Team membership, training, and credentials
- Field and safety protocols
- Human subjects protocols
- Manage equipment for disaster metrology and personnel protection
- Data preservation, security, and management plan
- Field tools (NDA's, permissions, survey inst.)
- MOUs with other agencies, academics, and others
- NIST Disaster Working Group

Research Thrust

Field Software, Hardware, and Survey Instruments



North Carolina Flood Field Study: Household Survey

Draft November 22, 2016

Note these initial questions are answered with respect to the sampled Housing Unit (HU) and the structure in which it is located.

| | | | | | |
|--|---|---|--|---|---|
| Housing Unit/Sample Unit Description: | | Address: _____ | | | |
| | | Verified by Respondent? | | YES | NO |
| Interview Attempt 1: Date/Time: | Interview Attempt 2: Date/Time: | Interview Attempt 3: Date/Time: | | | |
| Building Type: | 1. Single Family | 2. Multi-Family # of HUs _____ | 3. Manufactured/ Mobile home | 4. Other: Describe _____ | |
| Housing Unit (HU) appears occupied Habited or not habited? | YES: household present | YES, evidence of current habitation | Yes, occupied confirmed by neighbor | NO: not occupied, appears abandoned | NO, damage and not habitable |
| | | Yes, occupied, confirmed by management | DK: Indeterminate/ uncertain | NO: not occupied, under repair/reconstruction. | |
| Interview Attempt Result code: | Result of Interview attempt 1: _____ | Result of Interview attempt 2: _____ | Result of Interview attempt 3: _____ | Appointment or follow up: day and time Day/time: _____ | |
| | Result/ completion codes: 1. Completed interview 2. Incomplete/partial - 3. Not available or inconvenient (try to avoid and set , appointment set | 4. Soft refusal – closing team assignment. 5. Hard Refusal – contact captain, perhaps replacement 6. No Answer or response, but evidence of confirmed occupied | 7. Ineligible, (needs follow interview attempt) 8. Ineligible (with information about previous residents) | 9. Ineligible total – new construction – post HM 10. Ineligible property – structure not a residence 11. Bad address – could not locate HU. | 12. Not occupied residence, abandoned property, home destroyed. 13. No access. Gated community or safety fence preventing entry to damage residence(s). NOTE IF structure destroyed or abandoned, code is 12 |

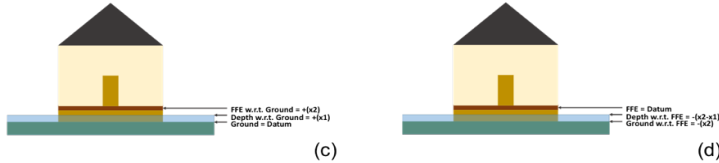


van de Lindt et al., 2018. NIST SP 1230



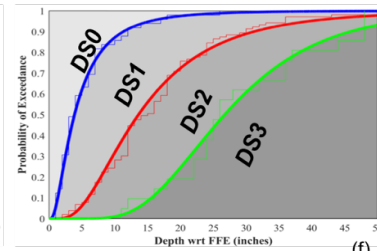
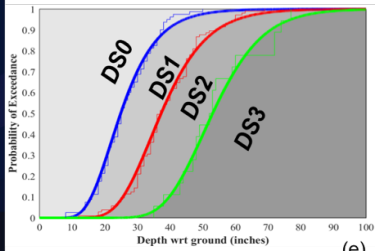
Standardizing Field Measurements

(a)



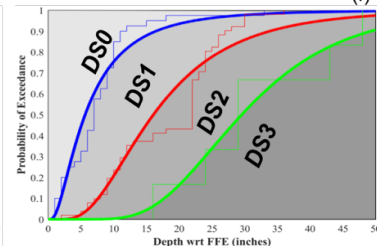
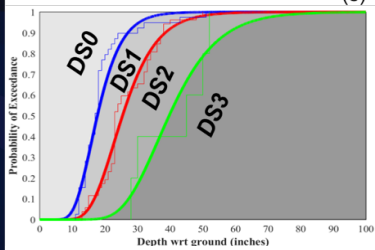
(c)

(d)



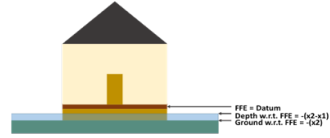
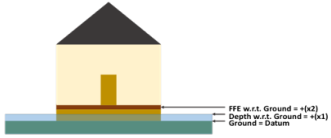
(e)

(f)

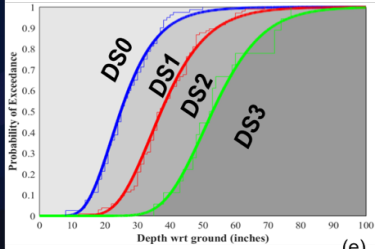


Standardizing Field Measurements

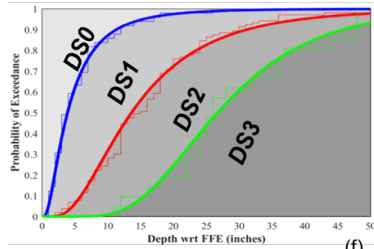
(a)



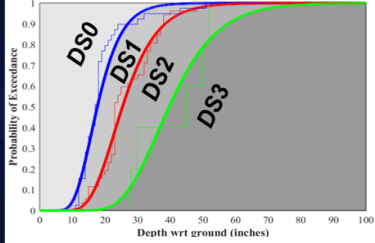
(c)



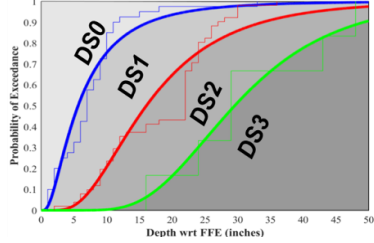
(d)



(e)



(f)



NIST
National Institute of Standards and Technology
U.S. Department of Commerce

DAMAGE ASSESSMENT REPORT

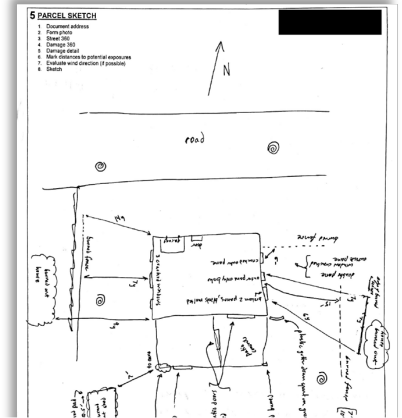
1 COLLECTION DETAILS
Incident Name: Camp Fire Recording Date: 12, 2, 18 Time Recorded: 11:55
Photo Release Form Approved: Yes No X20A Photo Numbers: 1417, 2119

2 ADDRESS Used RV/Travel Trailer Manufactured Home
Household: [redacted] Street Name: [redacted] Lot No.: [redacted]
City: CA State: CA ZIP: 95706

3 DAMAGE TO STRUCTURE
Extent of Damage: Affected Minor Major Destroyed No Damage
Ignition/Damage: Embers Radiation / Convection Undetermined
Exposure Type: Direct Indirect

| Feature | Damaged | Feature | Damaged | Feature | Damaged |
|---------------------|--|--|--|--|--|
| Roof | <input type="checkbox"/> | Gables | <input checked="" type="checkbox"/> | Windows | <input checked="" type="checkbox"/> |
| Roof Valley / Truss | <input type="checkbox"/> | Outlets | <input type="checkbox"/> | Doors | <input type="checkbox"/> |
| Dormers | <input type="checkbox"/> | Sliding Windows | <input checked="" type="checkbox"/> | Decking | <input type="checkbox"/> |
| Window Details: | <input type="checkbox"/> Single Pane <input type="checkbox"/> Frame Damage <input checked="" type="checkbox"/> Vinyl <input type="checkbox"/> Wood <input type="checkbox"/> Metal | <input type="checkbox"/> Multiple Pane <input checked="" type="checkbox"/> Glass Damage <input type="checkbox"/> Fiberglass <input type="checkbox"/> Other <input type="checkbox"/> ND | <input type="checkbox"/> Storm Door <input type="checkbox"/> Glass <input type="checkbox"/> Fiberglass <input type="checkbox"/> Other <input type="checkbox"/> ND | <input type="checkbox"/> Fiberglass <input type="checkbox"/> Other <input type="checkbox"/> ND | <input type="checkbox"/> Fiberglass <input type="checkbox"/> Other <input type="checkbox"/> ND |
| Door Details: | <input type="checkbox"/> Door Damage <input type="checkbox"/> Frame Damage <input type="checkbox"/> Glass <input type="checkbox"/> Fiberglass <input type="checkbox"/> Other <input type="checkbox"/> ND | <input type="checkbox"/> Storm Door <input type="checkbox"/> Glass <input type="checkbox"/> Fiberglass <input type="checkbox"/> Other <input type="checkbox"/> ND | <input type="checkbox"/> Storm Door <input type="checkbox"/> Glass <input type="checkbox"/> Fiberglass <input type="checkbox"/> Other <input type="checkbox"/> ND | <input type="checkbox"/> Storm Door <input type="checkbox"/> Glass <input type="checkbox"/> Fiberglass <input type="checkbox"/> Other <input type="checkbox"/> ND | <input type="checkbox"/> Storm Door <input type="checkbox"/> Glass <input type="checkbox"/> Fiberglass <input type="checkbox"/> Other <input type="checkbox"/> ND |
| Decking Details: | <input type="checkbox"/> Top Side <input checked="" type="checkbox"/> Posts <input type="checkbox"/> Bottom Side <input type="checkbox"/> Wood <input type="checkbox"/> Composite <input type="checkbox"/> Other | <input type="checkbox"/> Top Side <input checked="" type="checkbox"/> Posts <input type="checkbox"/> Bottom Side <input type="checkbox"/> Wood <input type="checkbox"/> Composite <input type="checkbox"/> Other | <input type="checkbox"/> Top Side <input checked="" type="checkbox"/> Posts <input type="checkbox"/> Bottom Side <input type="checkbox"/> Wood <input type="checkbox"/> Composite <input type="checkbox"/> Other | <input type="checkbox"/> Top Side <input checked="" type="checkbox"/> Posts <input type="checkbox"/> Bottom Side <input type="checkbox"/> Wood <input type="checkbox"/> Composite <input type="checkbox"/> Other | <input type="checkbox"/> Top Side <input checked="" type="checkbox"/> Posts <input type="checkbox"/> Bottom Side <input type="checkbox"/> Wood <input type="checkbox"/> Composite <input type="checkbox"/> Other |

4 NOTES/DESCRIPTION
Brief description of damage, general observations, details for Section 5:
- damaged
- many cracked windows, some with both panes
- many different ignitions on all sides of house
- shutters not behind
- hinges on 3 sides burned out



Damage:
Broken out windows
Melted window frame
Melted interior blinds





Confidential Reporting of Structural Safety (CROSS)-US

CROSS-US

Confidential Reporting on Structural Safety - US



CROSS-US

Confidential Reporting on Structural Safety - US

Home About Us Confidential Reporting Search Database Publications International



Quick Search

Keyword(s)

Classification
 - None Selected -

Recent Reports

705 Use of untreated billet connections in precast concrete structures

Whilst completing a third-party design appraisal, a correspondent found that solid steel billets intended to form the primary shear transfer mechanism between concrete beams and columns were insufficient for this purpose.

[View Report](#)

764 Hidden defects in railway masonry arch viaducts

A reporter is concerned about the sell-off of spaces under railway arches, as it may become difficult to carry out inspections and maintenance.

[View Report](#)

Current matters under consideration

CROSS-US (Confidential Reporting on Structural Safety - United States)

CROSS-US is a confidential reporting system established to capture and share lessons learned from structural safety issues which might not otherwise get public recognition. Our Panel provides expert commentary to help engineers learn from the experiences of others. CROSS-US will help the profession and improve public safety.

CROSS-US builds on the success of CROSS-UK, the UK based system that has been operating since 2005 with demonstrable public safety outcomes. It depends on individuals and firms participating by sending reports of their experiences and concerns on structural safety in confidence.

Reports submitted to CROSS-US are completely confidential and neither personal details nor information that could be used to identify a project or product are seen by anyone other than the Designated Persons as detailed on our [People](#) page.

Welcome to CROSS-US

As President-elect of SEI (Structural Engineering Institute), I was privileged to launch CROSS-US during the Structures Congress in Orlando in April 2019.

Email Updates

Enter your name and email address below to sign-up for email updates from CROSS-US. Your personal data will only be used for this purpose and you can unsubscribe at any time. Please see our [Privacy Policy](#) for further information.

Name

Email

How to Report

Online submission:

[Submit report online](#)

Submit by post:

[Download offline form](#)

Home About Us Confidential Reporting Search Database Publications International



Search Database

The database contains publications from CROSS-US and CROSS International partners. CROSS-US publications have the text 'US' in the publication title - all other publications are from CROSS International partners.

The search engine looks at document titles, a keyword associated with documents, and the text of Word documents. Entering a single word into the keyword facility will find all documents containing that word. Anyone wishing to make more detailed searches should contact administrator@cross-us.org for advice.

After receipt, reports are categorized using a general construction taxonomy.

Keyword(s)

Source: <https://www.cross-us.org/>
 © 2019 ASCE-SEI (used with permission)



NIST's Disaster and Failure Studies Program

Statutory Thrust

- Evaluate hazard events against deployment criteria
- Manage identification, vetting, and onboarding of NCSTAC members
- Develop agenda, manage logistics, and set frequency for NCSTAC meetings
- Create annual NCST reports to Congress
- Coordinate statutory activities across programs related to disasters.
- Conduct field studies under various authorities

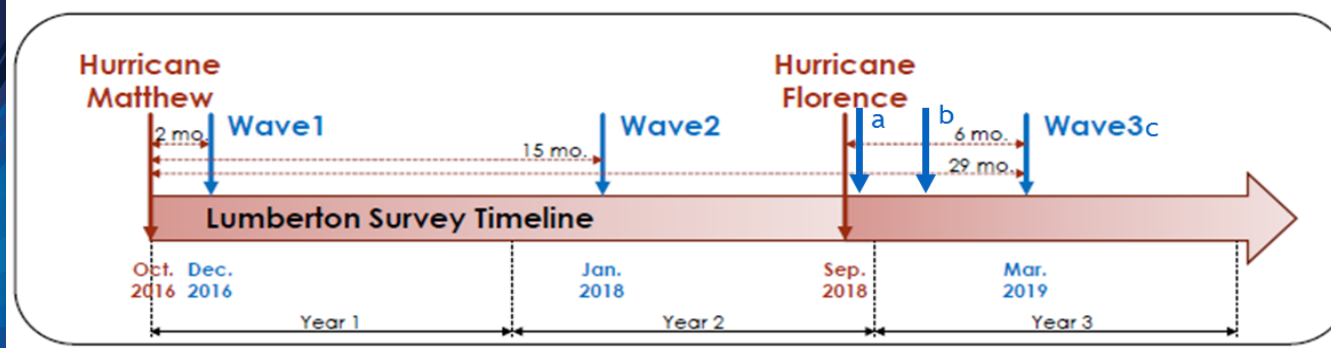
Procedures Thrust

- DFS SOP
- HOT Team membership, training, and credentials
- Field and safety protocols
- Human subjects protocols
- Manage equipment for disaster metrology and personnel protection
- Data preservation, security, and management plan
- Field tools (NDA's, permissions, survey inst.)
- MOUs with other agencies, academics, and others
- NIST Disaster Working Group

Research Thrust

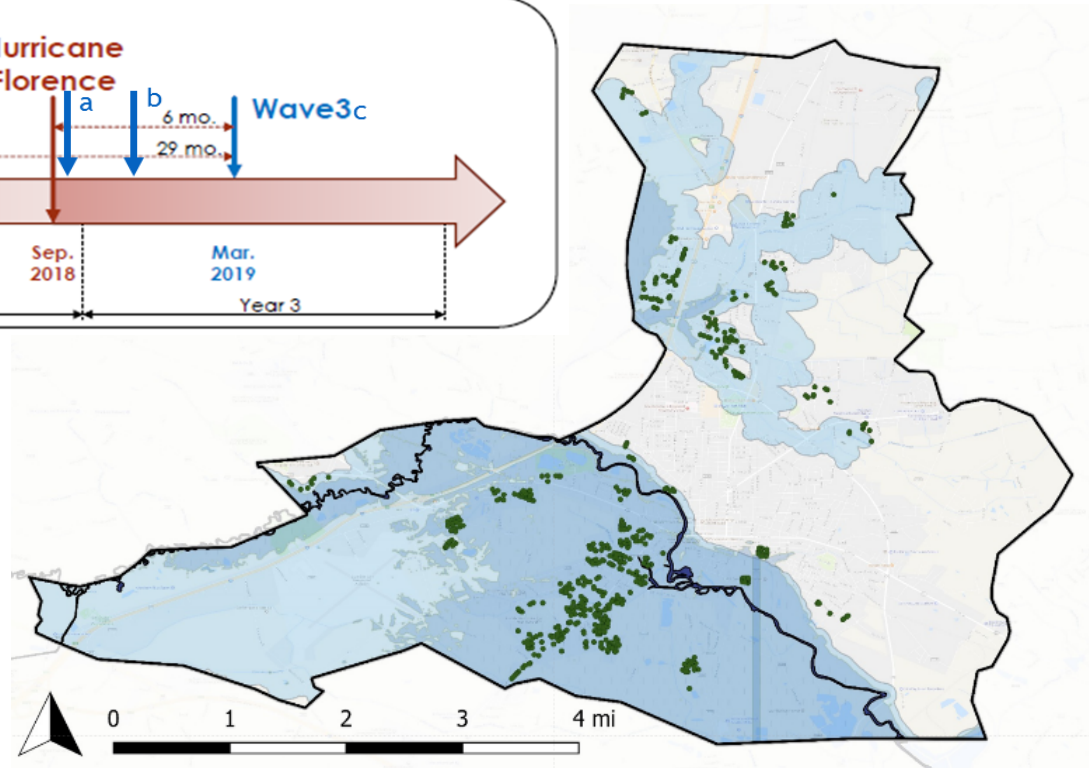
- Research program focused on disaster metrology, including structural performance and social sciences
- Coordinate research activities with NIST EL Groups, disaster statutory programs, NIST EL Divisions, and other NIST Labs
- Coordination with the Center of Excellence of Risk-Based Community Resilience Planning on field studies
- NIST's Disaster Resilience Grants Program
- Outreach and dissemination

Longitudinal Study of Lumberton, North Carolina



Legend

- Residential Samples
- Inundation
- Floodplain (100m Buffer)
- Lumber River
- Selected School Attendance Zone

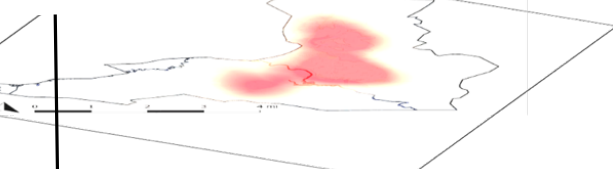


Disaster recovery: interdependencies through sampling

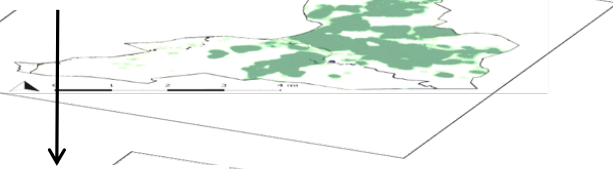
Inundation Map



School Zones



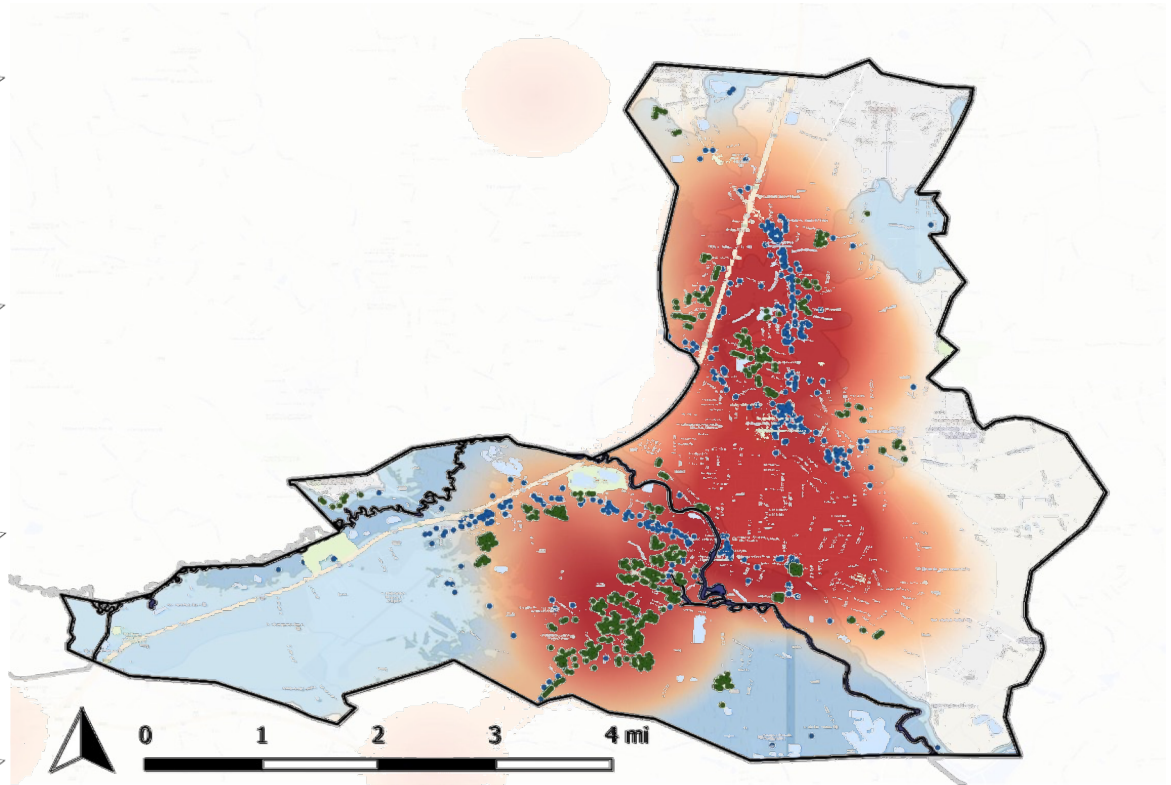
Housing Samples



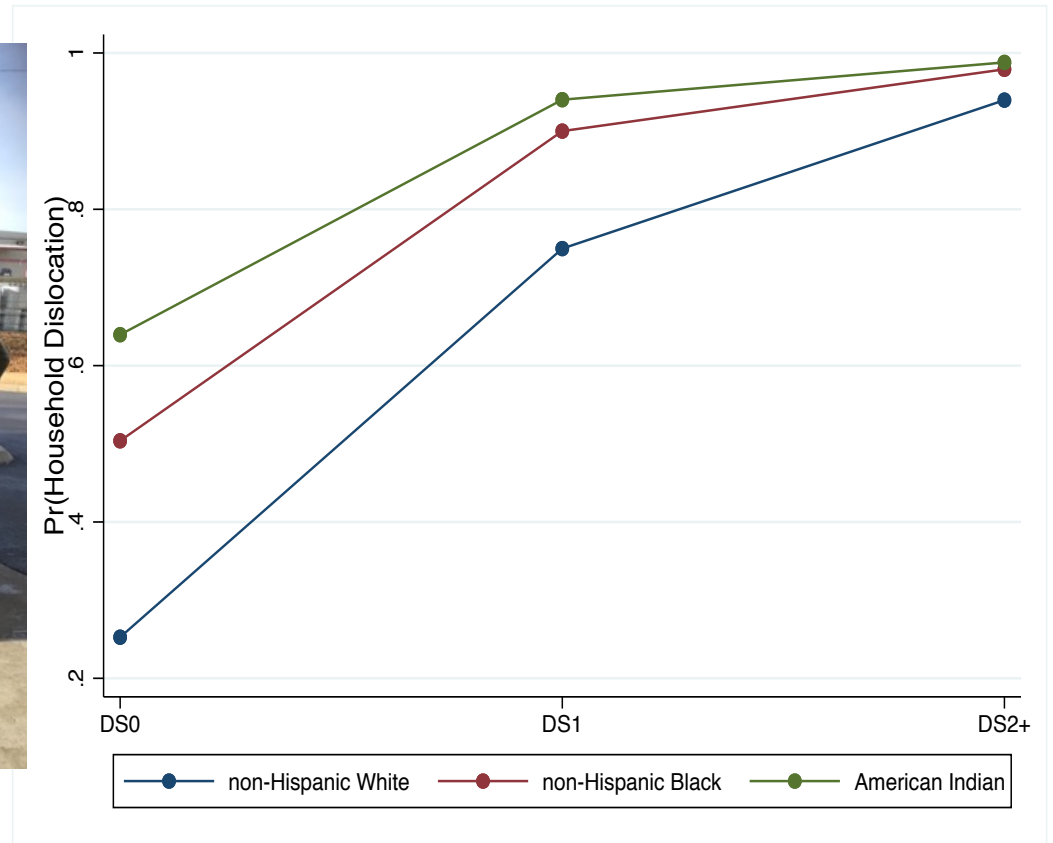
Business Samples



Resilience



Disaster recovery: housing



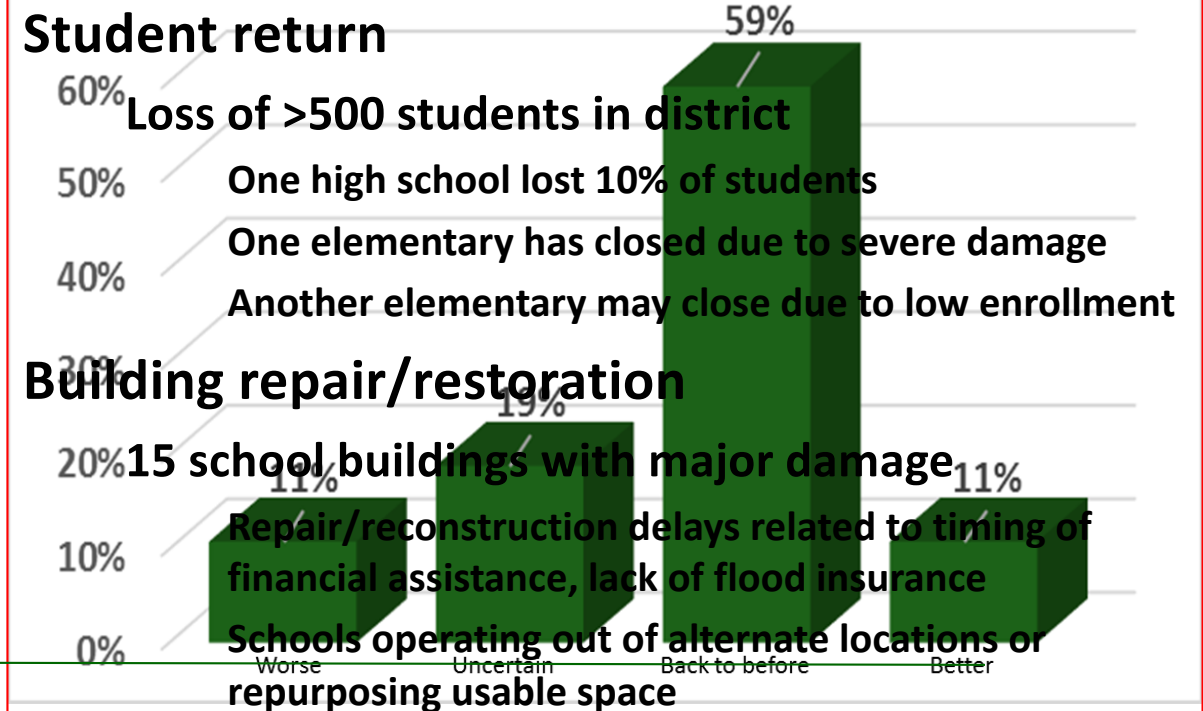
Disaster recovery: schools (preliminary data)

School Recovery

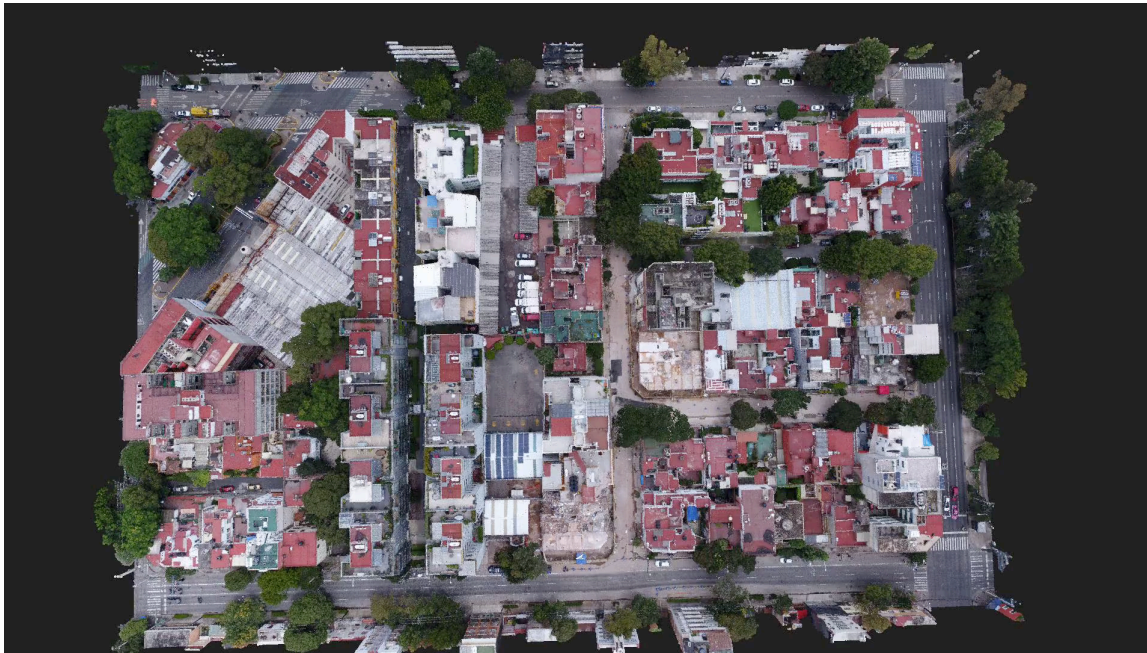
Indicators:

- Repair and restoration
- Recovery decisions
- Student return
- Perceived educational recovery

Children's Educational Recovery Distribution



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.



Thank you

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

*Director, Disaster and Failure Studies Program
Team Member, Hurricane Maria NCST Investigation
National Institute of Standards and Technology
U.S. Department of Commerce*