

# NCST Advisory Committee Meeting

November 8, 2021

## MEETING GOALS:

- Review NIST’s progress in DFS readiness,
- review the status of the NCST investigation of Hurricane Maria’s effects on Puerto Rico,
- introduce the new NCST Champlain Towers South investigation, and
- develop the Committee’s annual report to Congress.

June 10, 2021		
Time (EST)	Topic	Discussion Leader
<b><i>Opening Remarks</i></b>		
11:00 am – 11:05 am	Call to Order Roll Call	<b>Ben Davis</b> Management and Program Analyst, Disaster & Failure Studies Program & NCST Designated Federal Officer NIST
11:05 am – 11:15 am	Welcome Opening Remarks	<b>James K. Olthoff</b> NIST Acting Director
11:15 am – 11:25 am	Meeting Goals Review of Agenda	<b>Reggie DesRoches</b> NCSTAC Chairperson Provost Rice University
<b><i>Disaster and Failure Studies Program Updates</i></b>		
11:25 am - 11:40 am	DFS Updates on Enhancing the Readiness of Teams	<b>Tanya Brown-Giammanco</b> Director, Disaster & Failure Studies Program NIST
11:40 am - 11:50 am	Committee Discussion of the DFS Updates	<b>Reggie DesRoches</b>

***Hurricane Maria NCST Updates***

11:50 am – 12:10 pm	Hurricane Maria NCST Investigation Update	Joseph Main Team Lead, Hurricane Maria NCST NIST
12:10 pm – 12:25 pm	Committee Discussion of the Hurricane Maria NCST Investigation Update	Reggie DesRoches
12:25 pm – 12:55 pm	LUNCH BREAK	

***Champlain Towers South NCST Investigation***

12:55 pm – 1:20 pm	Champlain Towers South NCST Investigation Overview	Judy Mitrani-Reiser Team Lead, Champlain Towers South NCST NIST
1:20 pm – 1:45 pm	Champlain Towers South NCST Investigation Update	Glenn Bell Associate Team Lead, Champlain Towers South NCST NIST
1:45 pm – 2:15 pm	Committee Discussion of the Champlain Towers South NCST Investigation	Reggie DesRoches
2:15 pm – 2:25 pm	Summary Remarks	Joannie Chin Acting Director, Engineering Laboratory NIST
2:25 pm – 2:55 pm	Public Comment Period	Ben Davis
2:55 pm – 5:00 pm	NCSTAC Preparation of Annual Report to Congress	Reggie DesRoches
5:00 pm	ADJOURN	Ben Davis

# **Disaster & Failure Studies Updates on Enhancing the Readiness of Teams**

Tanya Brown-Giammanco, Ph.D.  
*Director, Disaster and Failure Studies Program  
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 Standard Operating Procedures
- 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
- Field tools (NDA's, permissions, survey instruments)
- MOUs with other agencies, academics, and others
- NIST Disaster Working Group

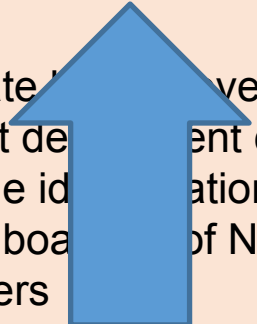
## Research Thrust

- 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 for Risk-Based Community Resilience Planning on field studies
- NSF/NIST Disaster Resilience Research Grants Program
- Outreach and dissemination

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# Events Scoring

<i>*NIST deployed a team</i> Disasters Scored June 2021 – October 2021			
Date	Event	Event Consequence Score (max=5.0)	Evacuation & Response Score (max=5.0)
06//2021	Chicago Metro, Illinois Tornado	2.6	3.0
06/24/2021	Champlain Towers South partial collapse*	5.0	5.0
07/14/2021	Dixie Fire (WUI), California	3.0	1.0
08/14/2021	Haiti Earthquake	3.0	5.0
8/29/2021	Hurricane Ida	4.1	5.0

# NIST SciServer: Collaborative Science Platform

## NIST-JHU PREP Project

- Project Goal: add computer science capacity to NIST disaster statutory programs via the NIST's Professional Research Experience Program (PREP)
- NIST Associates: Prof. Alex Szalay, Dr. Gerard Lemson, and Dr. Arik Mitschang
- Project Scope: adopt data semantic standards and foster interoperability between other disaster repositories; design a public database that can easily be managed by NIST; combine traditional data management and access services with computing resources (e.g., Python and R).

**SciServer** is a system allowing scientists and researchers across multiple domains to host and share their datasets and provide query and analysis tools for collaborative work.

SciServer Dashboard

Data, Collaboration, Compute

Files: You have 47 Shared User Volumes. You have 33 Owned User Volumes.

Groups: You have 0 Group Invitations. You have 47 Owned Groups.

Compute Jobs: You have 0 Jobs Running. You have 0 Jobs Completed in 24 hours.

Activity Logs: You logged into the Dashboard on 02 Sep 2019 10:38:14 am.

SciServer Apps

- CasJobs**: Search online big relational databases collections, store the results online, and share them.
- Compute**: Analyze data with interactive Jupyter notebooks in Python, R and MATLAB.
- Compute Jobs**: Asynchronously run Jupyter notebooks in Python, R and MATLAB or commands.
- SciDrive**: Drag-and-drop file hosting and sharing services.
- SkyServer**: Access the Sloan Digital Sky Survey data, tutorials and educational materials.
- SkyQuery**: A scalable database system for cross-matching astronomical source catalogs.

SciServer - 2.1.1 Dashboard - 2.1.2

Powered by:

<http://www.sciserver.org/>  
(with permission from Prof. Szalay)







# Automated Event Scoring through SciServer

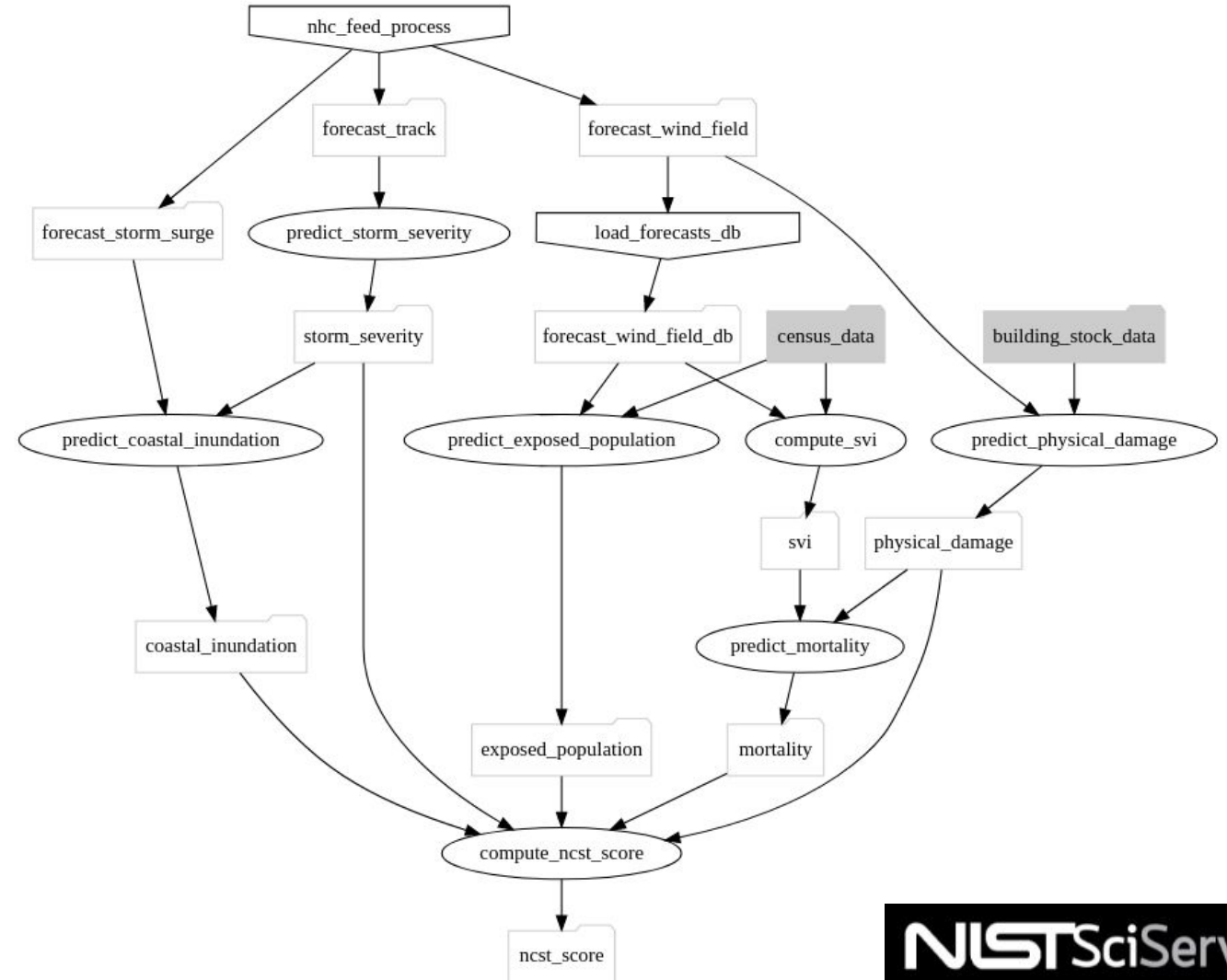
Implementation of coordinated activities across disaster statutory programs for NCST event scoring:  
fully automated workflow to calculate “Event Consequence” score during NWIRP’s *phase zero*

**NATIONAL WINDSTORM  
IMPACT REDUCTION PROGRAM**

**TROPICAL CYCLONE COORDINATION PLAN  
FOR SCIENCE AND TECHNOLOGY**

*Alpha Version May 2020*



# Automated Event Scoring through SciServer

Forecast storm surge: National Hurricane Center

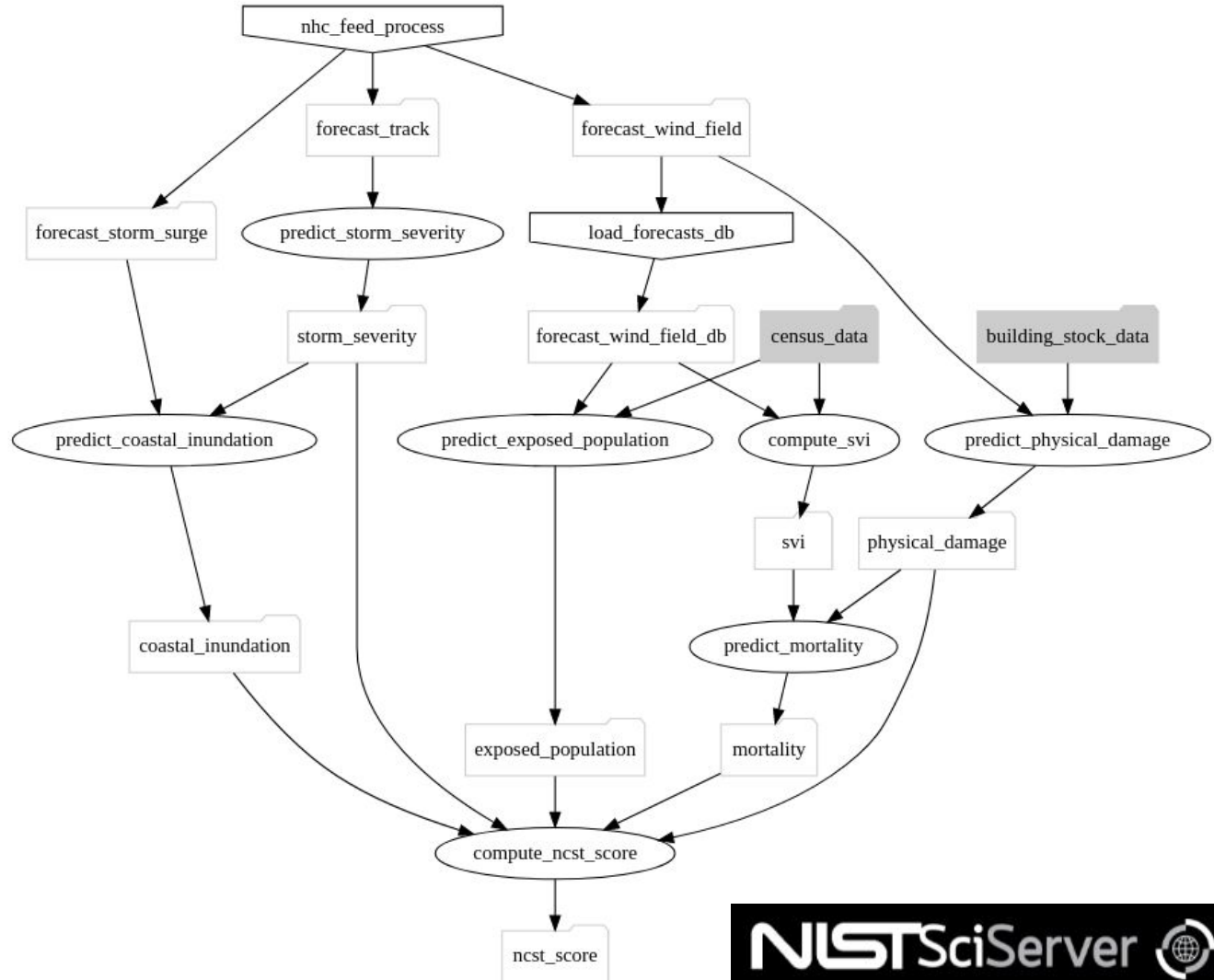
Forecast track: National Hurricane Center

Forecast wind field: National Hurricane Center

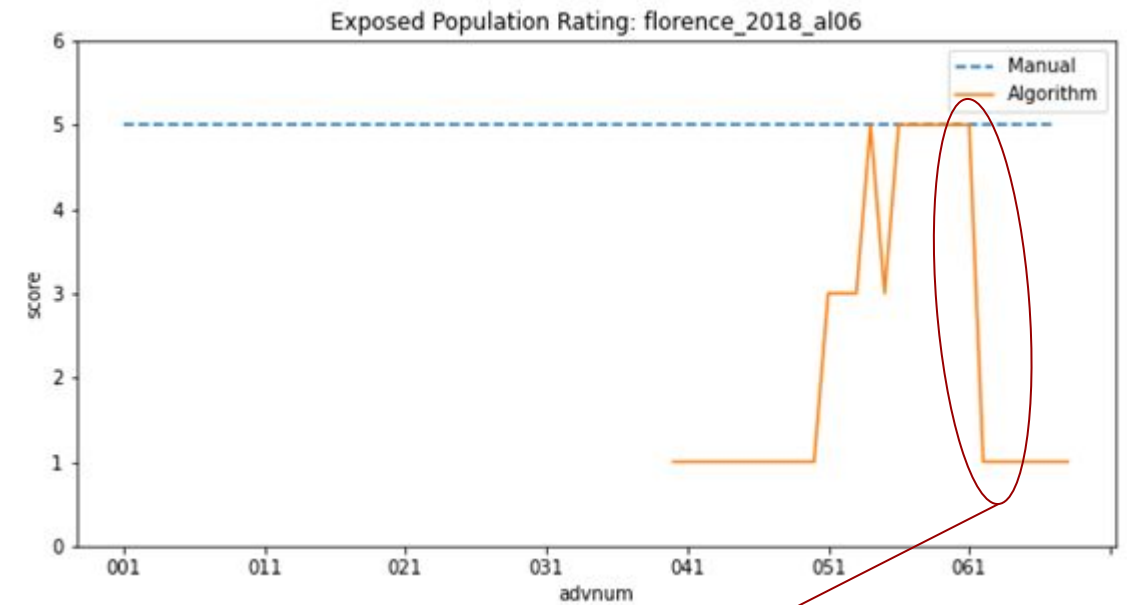
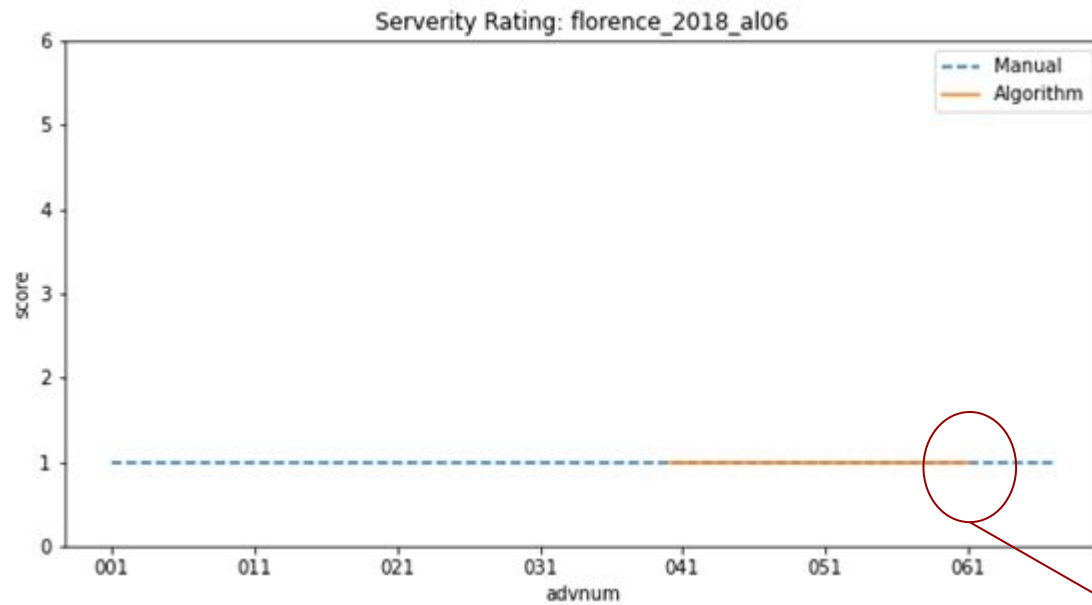
Census data: US Census Bureau

Building stock data: not yet defined

Social Vulnerability Index: Centers for Disease Control



# Automated Event Scoring through SciServer: Results



Landfall

# NCSTAC Membership

- 7 current members (12 allowed)
  - Current expertise in infrastructure, structural engineering, codes and standards, earthquakes, sociology, public health, disaster response
  - 5 current members' 2nd terms expire between July 1-September 30, 2023
- **TARGET:** recruit and onboard 3-5 additional members by FY22 Q2
  - fire
  - forensics
  - geotechnical
  - materials science
  - wind

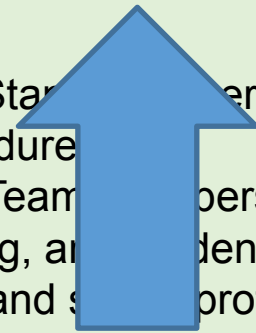
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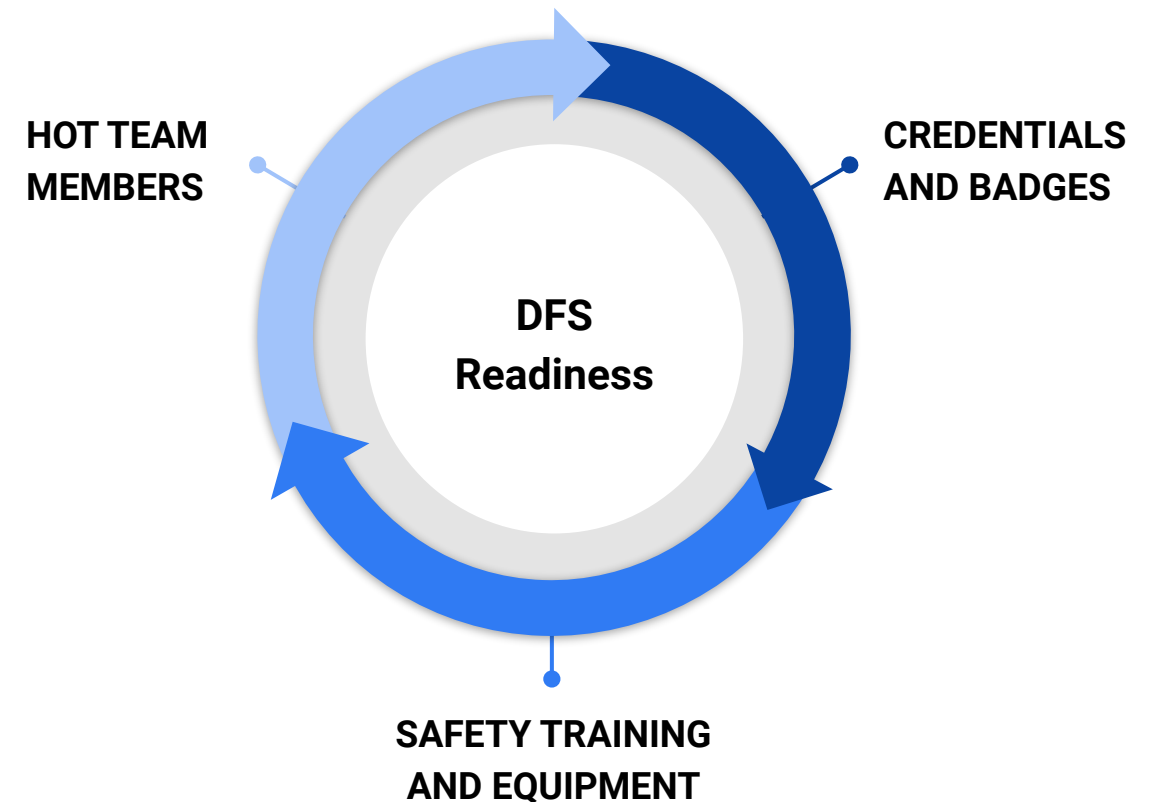


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# DFS Procedures: Hot Team

- Recruitment and credentialing of new Hot Team Members based on Membership Decision Process enacted in September 2020
- Development of regular, recurring training regimen to be administered proactively in winter “off-season”
- Development of “Go Kits” to collect all PPE in single package for easy deployment



# DFS Procedures: New Developments

- As a result of Champlain Towers South NCST Investigation
  - Rapid PRA clearance for interviews of witnesses, survivors, emergency responders, maintenance personnel, etc.
  - NCST Volunteer Agreement
  - MOU with NSF
  - IAA with USACE
  - Development of Evidence Tagging Procedures
- PRA generic clearance for decision science data collection
- Initial discussions to develop contract for Wind Speed Modeling for FEMA Mission Assignments
- Standup of NIST Disaster Working Group

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# DFS Research

- Planning for Wave 5 data collection for Lumberton, NC longitudinal study with Center of Excellence for Risk-Based Community Resilience Planning
- NSF/NIST Disaster Resilience Research Grants Program awardees to be announced soon
- Upcoming outreach:
  - 9th Forensic Engineering Conference-November
  - ASCE International Conference on Sustainable Infrastructure-December
  - Center of Excellence for Risk-Based Community Resilience seminar-December
  - Lifelines Conference (San Fernando Earthquake Conference - 50 Years of Lifeline Engineering)-February 2022
  - Americas Conference on Wind Engineering-May 2022

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*\*NIST*

*^Johns Hopkins University PREP Associates*

## Questions?

 Please 'raise your hand' using the Blue Jeans Participant window and unmute your audio and video