Industrial Hygiene at FEMA Disaster Operations

Timothy Paz, CIH | National Industrial Hygiene Program Manager

FEMA

March 22, 2022

Career at a Glance

Clayton Chemical Company

1988 - 1990

Environmental Operations, Inc.

1990 - 1992

Weldon Spring Site Remedial Action Project (DOE Superfund Cleanup Project)

JE JACOBS

1992 - 1996

MCDONNELL DOUGLAS

1997 Merger

BOEING

1996 - 2009

2010 - 2014

ARCHITECT OF THE CAPITOL

2014 - 2021

FEMA

2021 - Present

Discussion Topics

01 FEMA Overview / Strategic Plan

02 Safety at FEMA Disasters

03 Hurricane Ida Responder Camps

04 Heat Injury & Illness Prevention SEP

05 Wrap Up

FEMA

01. FEMA Overview

FEMA's mission is helping people before, during, and after disasters.

FEMA is no longer just looking at themselves as an emergency agency but also as a **resiliency** agency for our nation.

Established in 1971

2002 Homeland Security Act

Over 20,000 agency employees

42 Fixed Sites | 10 Regions

Core Values

- **Compassion**
- **Fairness**
- **Integrity**
- **Respect**

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2022-2026
FEMA Strategic Plan

Building the FEMA our Nation Needs and Deserves

Goal 1:
Instill Equity as a Foundation of Emergency Management

1.1 Cultivate a FEMA that prioritizes and harnesses a diverse workforce

1.2 Remove barriers to FEMA programs through a people first approach

1.3 Achieve equitable outcomes for those we serve

Goal 2:
Lead Whole of Community In Climate Resilience

2.1 Increase climate literacy among the emergency management community

2.2 Build a climate resilient nation

2.3 Empower risk-informed decision making

Goal 3:
Promote and Sustain a Ready FEMA and Prepared Nation

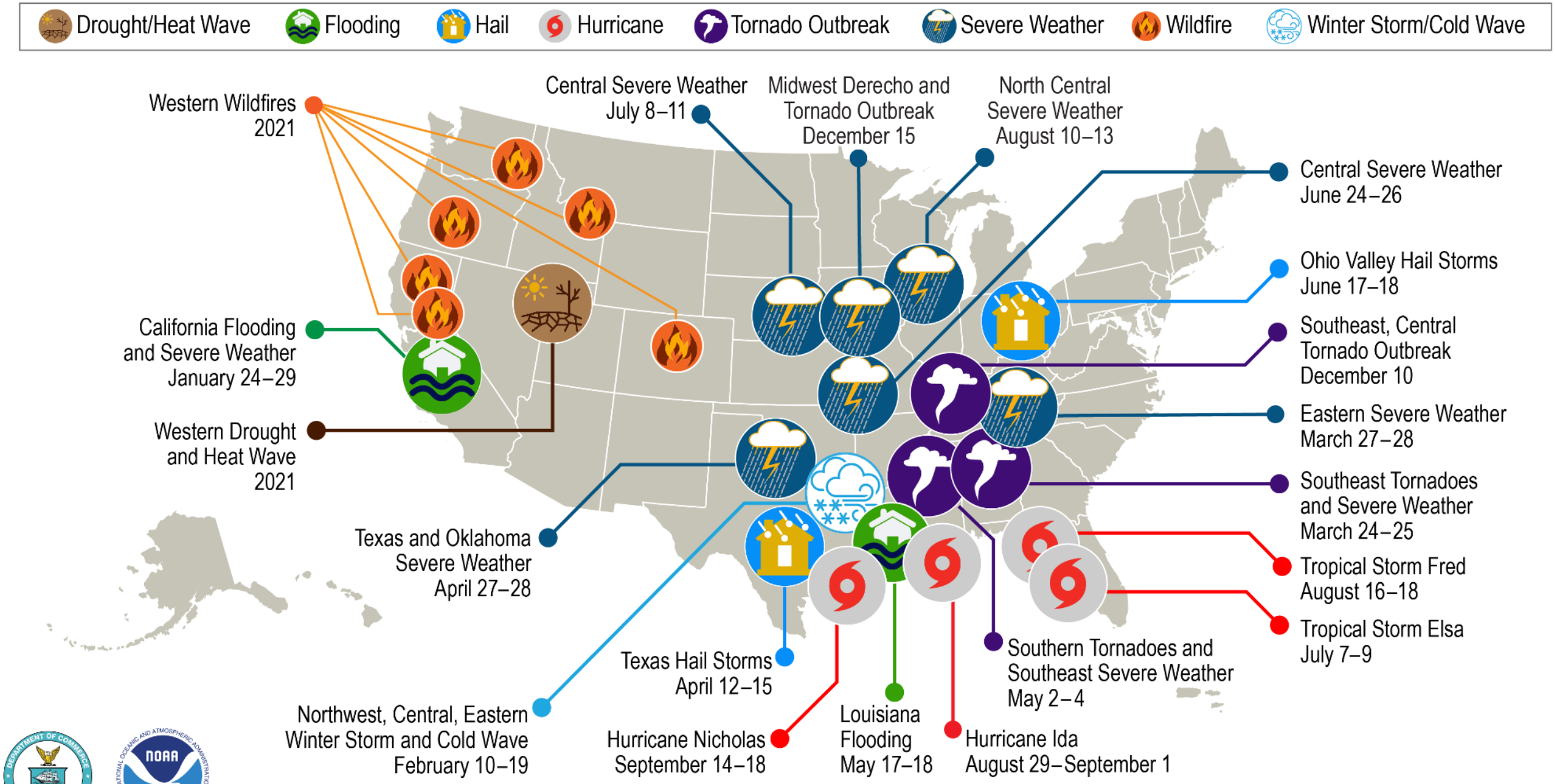
3.1 Strengthen the emergency management workforce

3.2 Posture FEMA to meet current and emergent threats

3.3 Unify coordination and delivery of federal assistance

Industrial Hygiene at FEMA Disaster Operations

U.S. 2021 Billion-Dollar Weather and Climate Disasters



*This map denotes the approximate location for each of the **20 separate billion-dollar weather and climate disasters that impacted the United States in 2021***

02. Safety at FEMA Disaster Sites

The President appoints the FCO to manage the Federal response, recovery, and mitigation operations for each presidentially declared disaster or emergency.

FEMA Safety is on the Federal Coordinating Officer (FCO) Staff

- Unique and non-traditional workplaces including housing sites, floods, wildfires, and hurricanes
- Hazards encountered by FEMA Individual Assistance (IA) personnel in the field
- Disaster Safety Officers must apply general industry regulations to non-traditional workplaces

Safety Technical Support

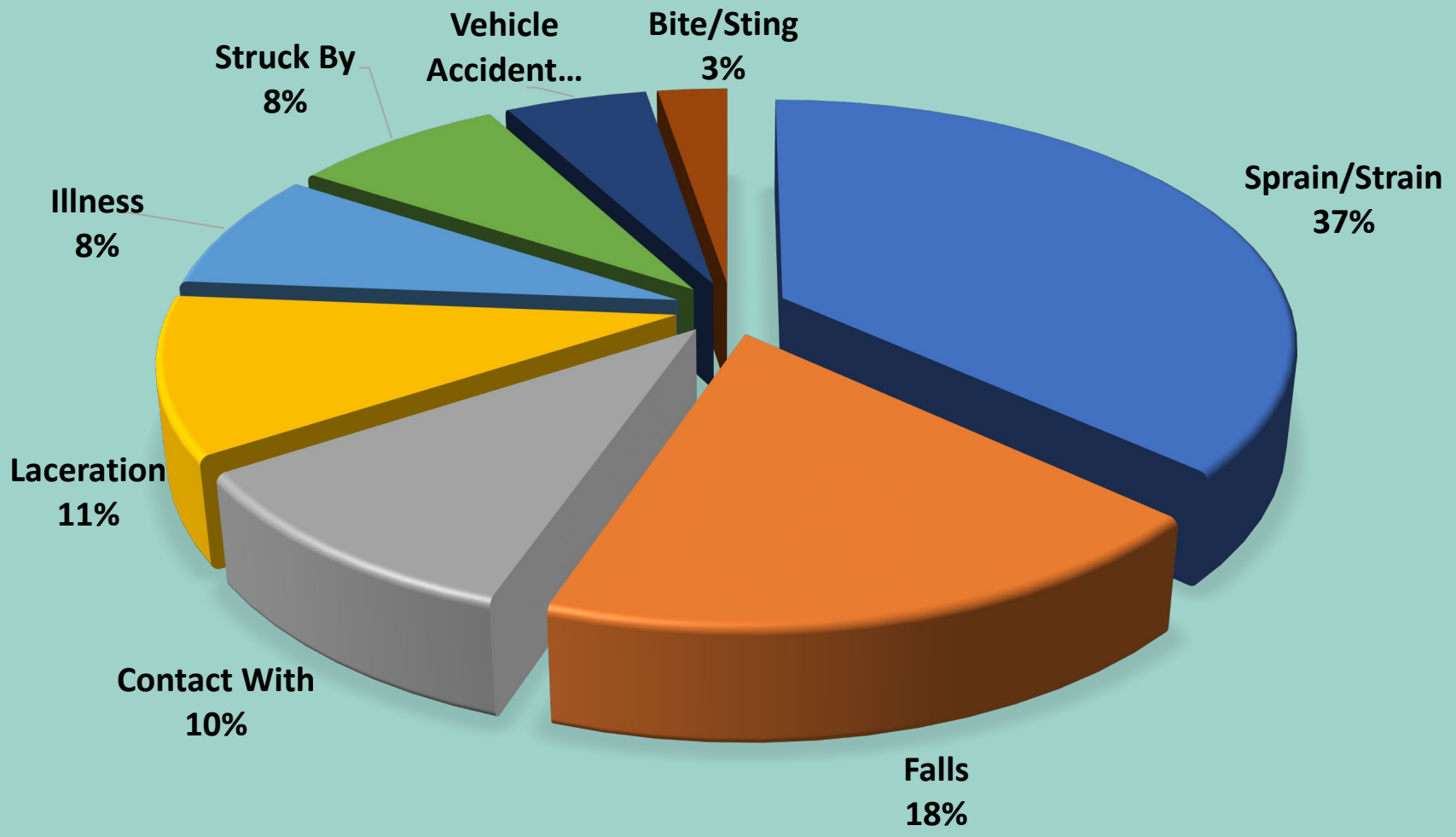
- Disaster Safety Officers (DSOs)
- Collateral Duty Safety Officers (Regions, MERS, NPSCs, DCs)
- CDP, Mount Weather, TROs, THU Staging Sites
- EHS Division – HQ (Policy and Oversight)

FEMA Employees?

- Many federal, state, and local partners
- Some locally hired responders become FEMA employees while supporting the disaster
- Urban, Search, & Rescue Teams (US&R)
- Responder teams in at a certain level of protection working next to crews that are in a different level of protection
- Uncoordinated hazard assessments
- Responders respond and go to work right away, with or without proper hazard assessment guidance/information

CY 2021 Injuries & Illnesses Reported - FEMA

Agency CY2021
TCR = 0.23
LTCR = 0.16

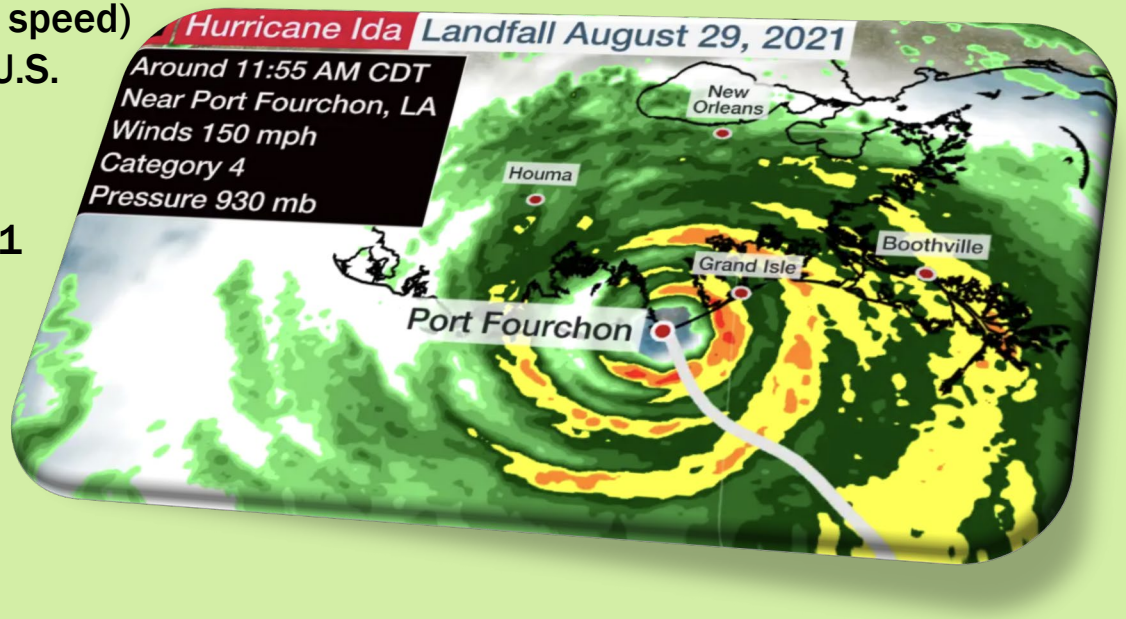


Falls most common injury at DR-4611-LA Hurricane Ida

03. Hurricane Ida Responder Camps

Made landfall along the southeastern coast of Louisiana near Port Fourchon around 11:55 AM CDT August 29, 2021 with maximum sustained winds of 150 mph.

Fifth strongest hurricane (based on wind speed) ever to make landfall in the continental U.S.



Deployed to FEMA-4611-DR on September 02, 2021 (about 4 months after joining FEMA).

Demobilized on September 29, 2021.

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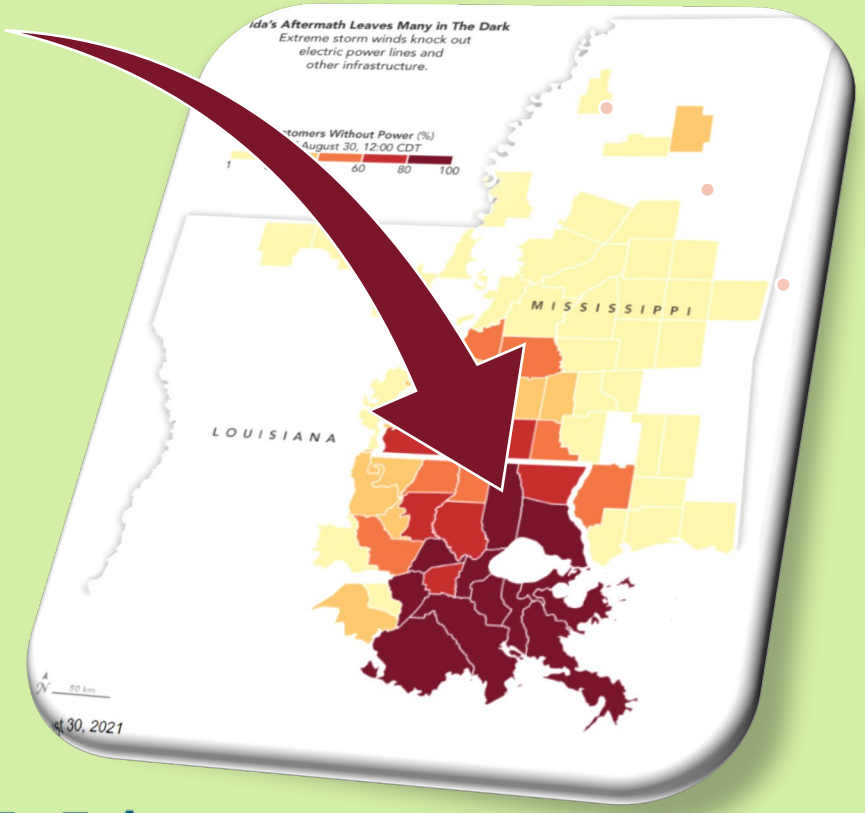
Source: https://weather.com/storms/hurricane/news/2021-09-02-hurricane-ida-recap-louisiana-south-northeast

Aftermath: In the Dark

100% Customers without Power



More than 1 million customers (businesses, households) in Louisiana had reportedly lost power by midday on August 30.

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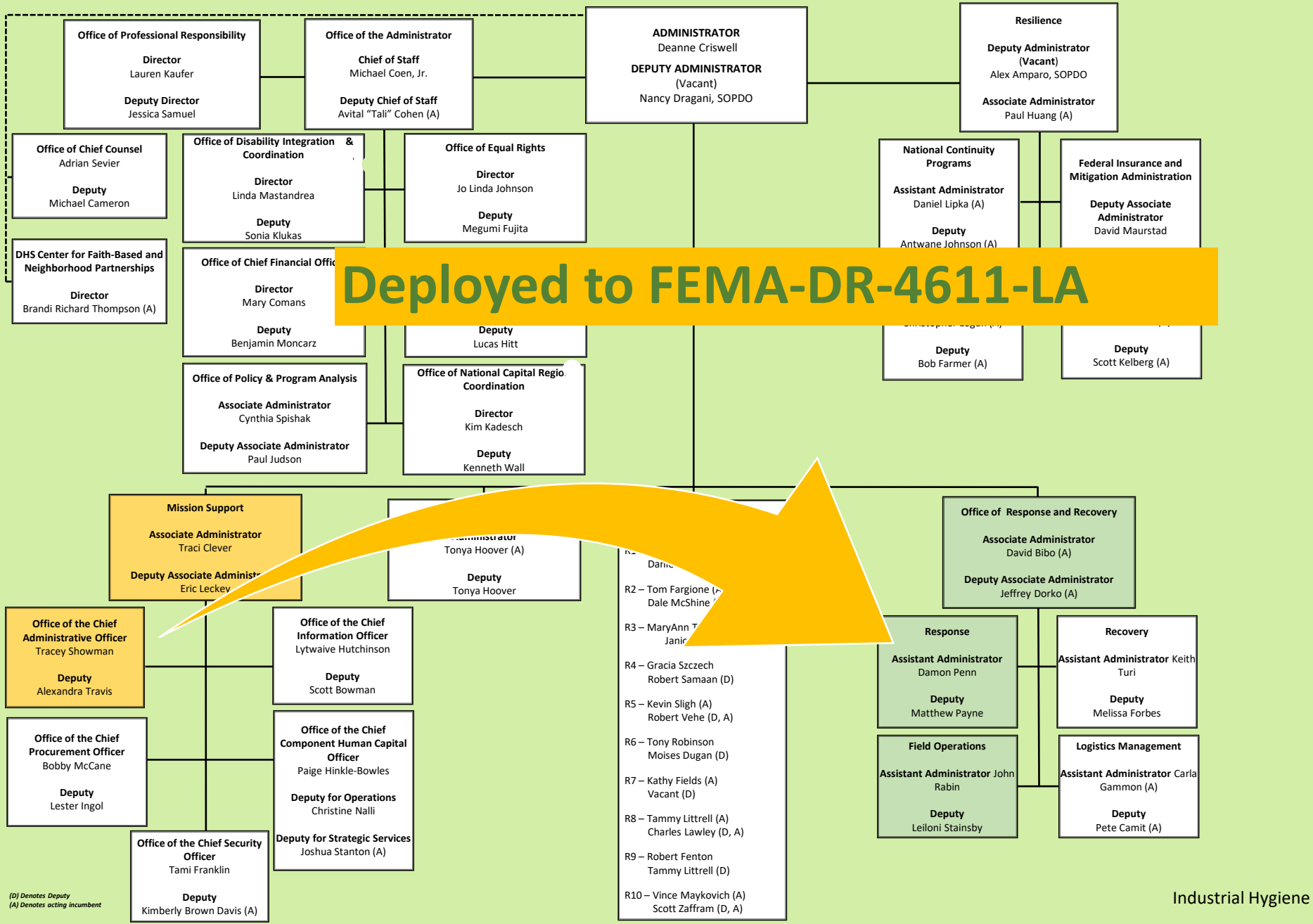
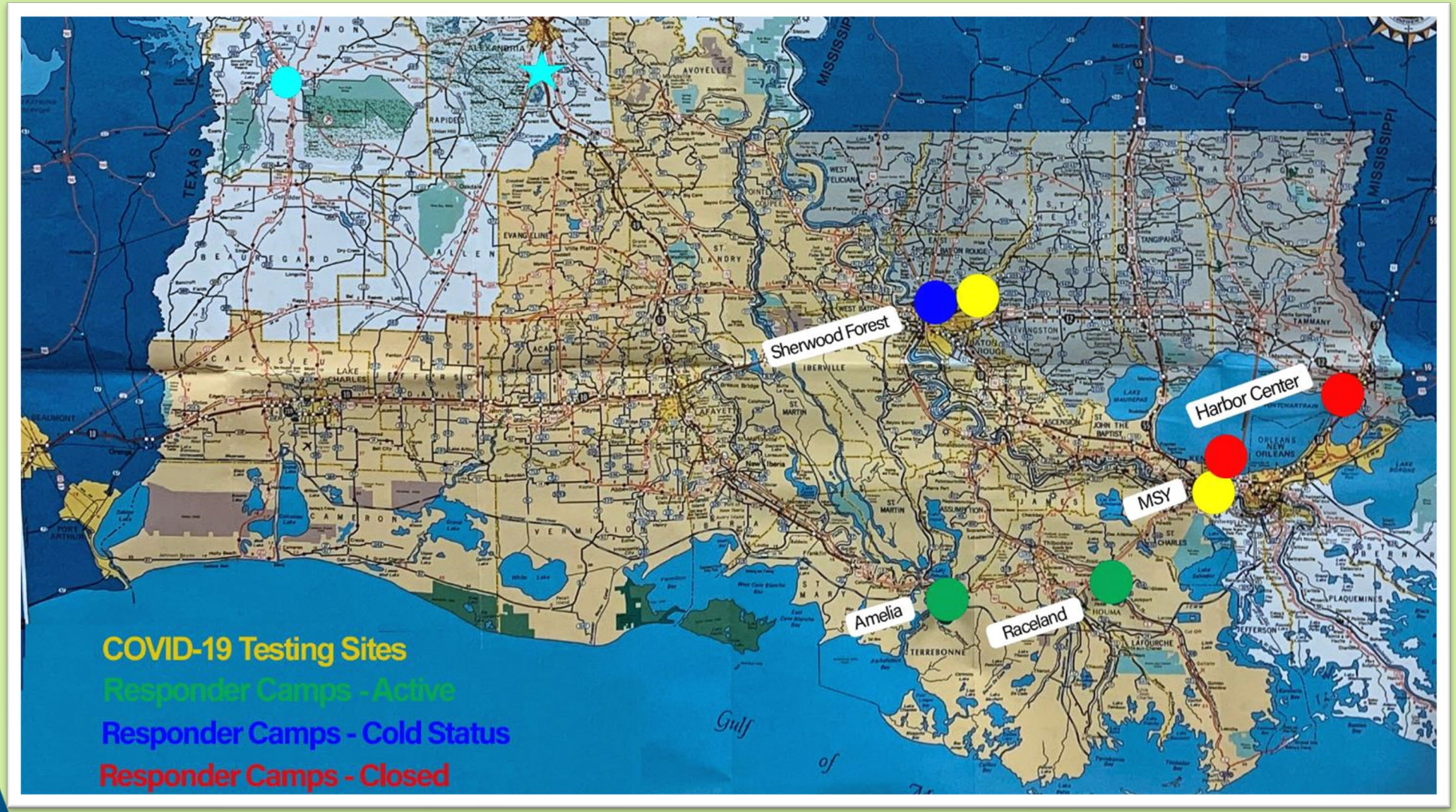
Source: https://earthobservatory.nasa.gov/images/148767/hurricane-ida-batters-louisiana

U.S. Department of Homeland Security / FEMA

August 13, 2021



Responder Support Camps



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Responder Support Camps

- **300 – 2,000 Occupants**
- **Dining Service**
- **Health Clinic/Nursing Staff**
- **Maintenance and Cleaning Staff**
- **Shower Facilities and Restrooms**
- **Laundry Facilities**

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Responder Support Camps

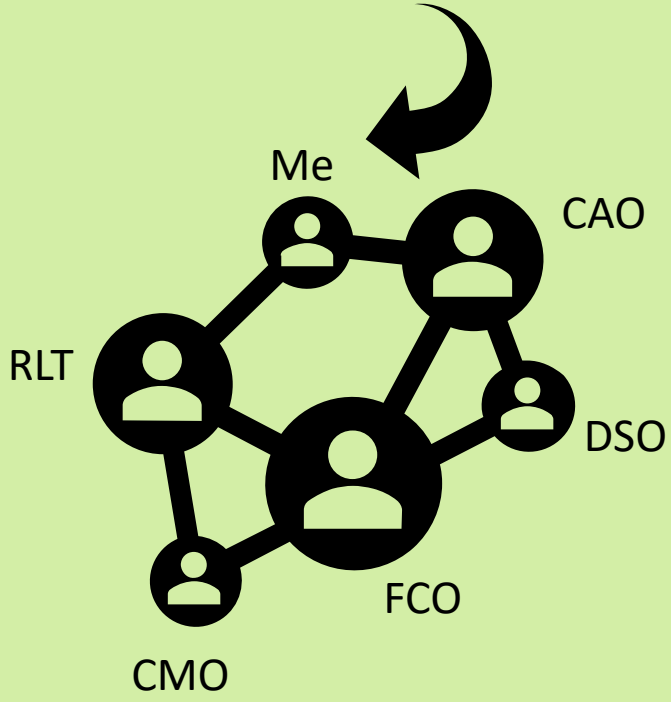
DSOs inspect facilities prior to occupancy

OSHA 29 CFR 1910.142 Temporary Labor Camps

Site must be adequately drained. Not located within 200 feet of a swamp

Water supply must be approved by health authority. Provide 35 gallons per person per day

My Role



- Liaison between Office of Chief Administrative Officer (OCAO) and the Responder Lodging Team
- Liaison between the Responder Lodging Team and Disaster Safety Operation (also part of Mission Support/OCAO)
- Support the Disaster Safety Operation (also part of OCAO)
- Eyes and ears for OCAO & Chief Medical Officer – The CAO is responsible for the success of the Responder Support Camp!
- Acquire field experience so I can effectively manage the agency Industrial Hygiene Program.

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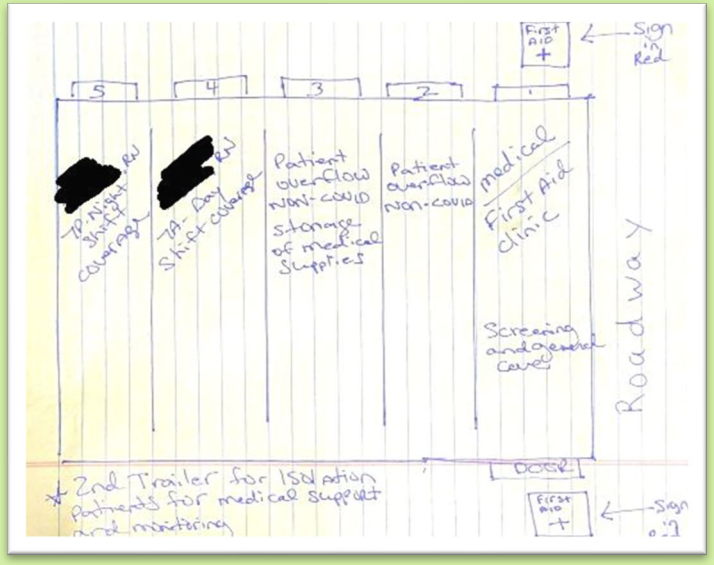
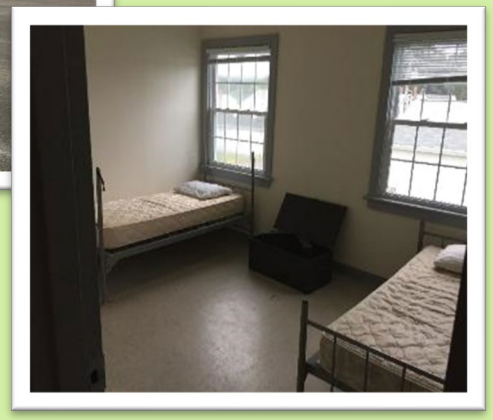
My Activities



- COVID-19 – Mitigation plans, screening entrants, testing locations, observation of tests, enforcement of rules, contact tracing reports, isolation rooms available, etc.
- Site visits: Responder camp proposed sites, daily inspections, COVID-19 Checklist, etc.
- Supporting the installation of occupational health units
- Staffing occupational health clinics, stress counseling locations, tracking down supplies, taking inventory, etc.
- Daily calls with the Responder Lodging Team, OCOA Team and Disaster Safety Operations

Responder Lodging Team



Reporting & Data Management

Communication & Customer Service

Logistics & Operations

Facility Management

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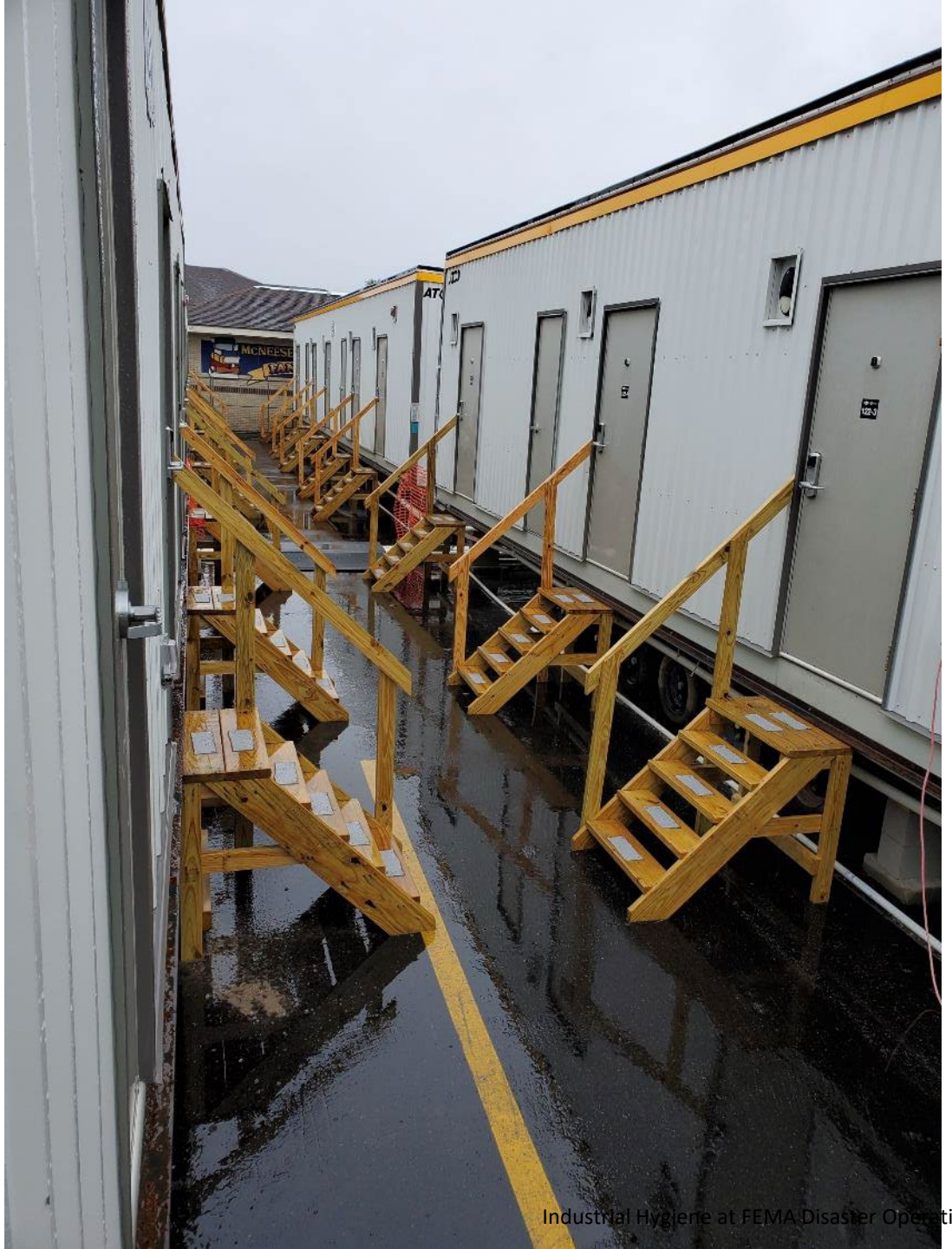
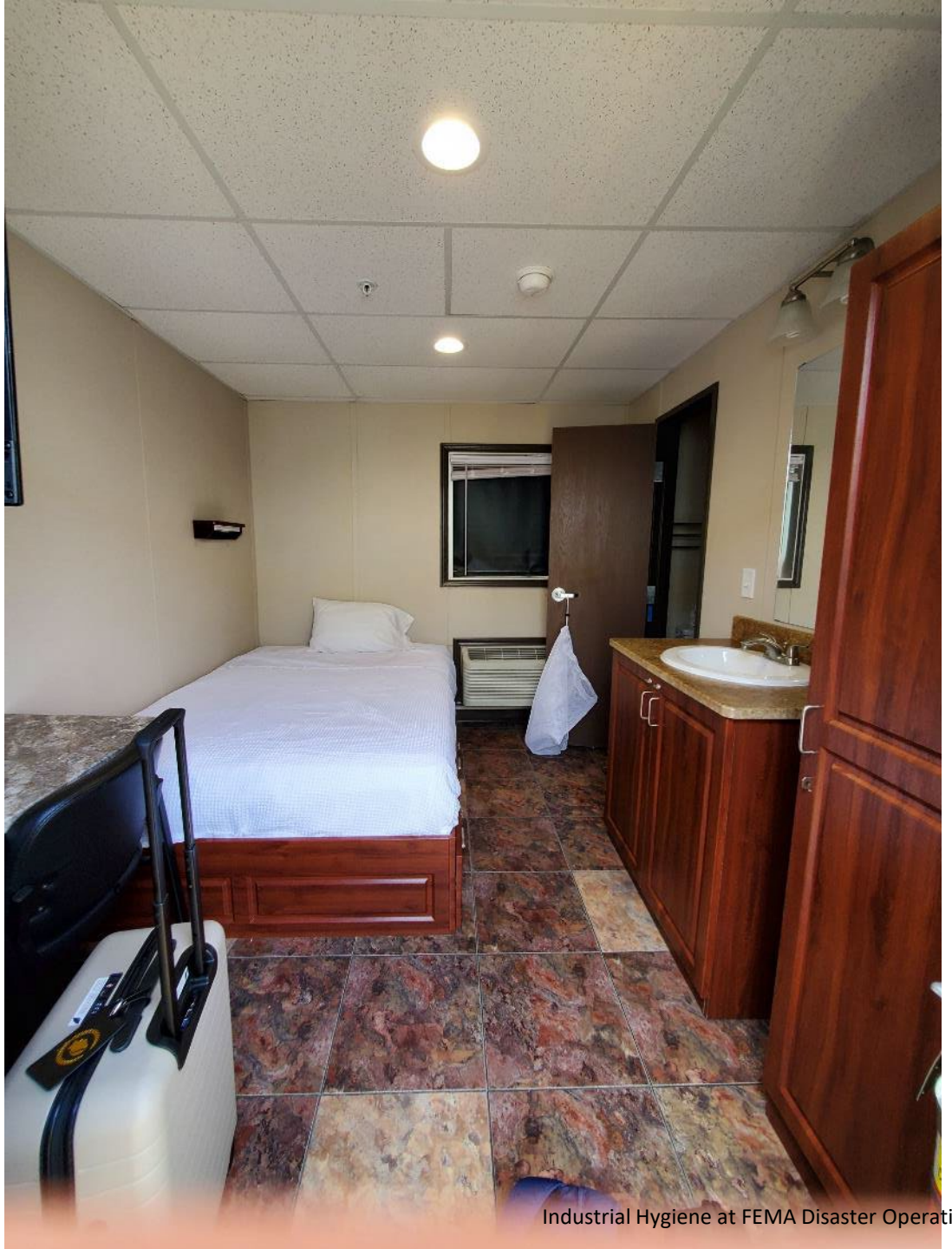
Responder Lodging Capsules

3001



CLUs – Container Lodging Units (Individual)



MSY – Responder Support Camp

MSY – Responder Support Camp

The Harbor Center – Slidell, LA

PROPER VENTILATION?

WIND BLEW DOOR OPEN
TOOK IN WATER

CAUTION
WIDE TURNS
EDS
Emergency Disaster Services
HAD TO STAND ON 2ND OR 3RD STEP TO ALLOW DOOR TO SWING OPEN
SOME HANDRAILS WERE WOBBLY

PLEASE
MASKS ENCOURAGED BUT NOT REQUIRED OUTDOORS
We encourage mask use even outdoors when in particularly dusty environments. Dust may lead to an increase in coughing, which will both increase the risk of COVID-19 transmission and confuse the situation as to whether the coughing itself represents mild COVID-19 or is due to dusty lungs. We thank you!
DRY CONDITIONS + GRAVEL ROADS = DUST, A LOT
(ESPECIALLY PROBLEMATIC DURING A PANDEMIC!)

Please Wear Your Mask
FEMA
MAINTAIN SOCIAL DISTANCING
PLEASE DO NOT GATHER IN GROUPS OR HUDDLES
FEMA
ATTENTION
MANDATORY
FEMA
SCREENING POINT
FEMA
National
Support Services
CANCEL THE WATER TRUCK!

COTTON
LOGISTICS
BUILDING #2
FLOODING OF
PASSAGE WAY

COTTON
LOGISTICS

Main Objectives for ESH

I was on a daily conference call with the Chief Administrator Officer. She would often ask what our top 3 priorities were for the next 24 hours.

Before giving our top priorities, I made a habit of 1st declaring what our main objectives were for the responder camps.....so we were all playing by the same sheet of music.

1. **Preventing injuries and illness**
2. **Keeping COVID-19 out of FEMA sites**
3. **Medical treatment of injuries or illnesses**
4. **Mental health support: stress counselors**

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Top Industrial Hygiene Concerns

Industrial Hygiene is the art and science dedicated to the anticipation, recognition, evaluation, control, and confirmation of environmental stressors in or arising from the workplace that may result in injury, illness, impairment, or affect the well-being of workers and members of the community.

1. **Heat Stress and Strain**
2. **COVID-19: Testing/Preventative Measures**
3. **Dust Control**
4. **IAQ/Effects of Flooded Buildings**
5. **Fatigue/Mental Health**

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Top Industrial Hygiene Concerns

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1. Heat Stress and Strain
2. COVID-19: Testing/Preventative Measures
3. Dust Control
4. IAQ/Effects of Flooded Buildings
5. **Fatigue/Mental Health**

Mental health is health; and is major determinant of a worker maintaining emotional and cognitive "well-being."

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Other Concerns

1. Evacuations: alerts, rally points, structures
2. Security – mini lockers had no locks
3. Workplace violence
4. Security – doors lacked locks
5. Wildlife / environmental

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Biggest Challenges to Success

1. Getting Health Unit Supplies
2. Staffing Safety Support
3. Communication / Coordination
4. Changing Posture / Conditions
5. COVID-19 / Contractor bypassing screening procedures

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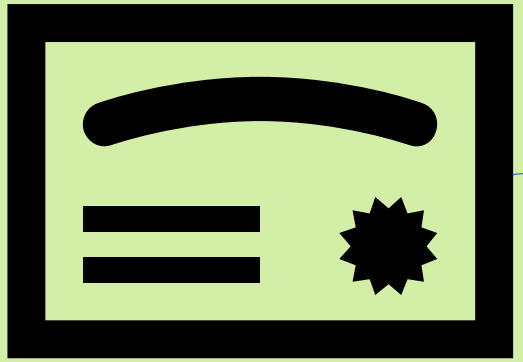
Successful Outcomes



Responder Lodging Team

1. **Zero reportable injuries**
2. **Exceptional Customer Service Award**
3. **Gained an understanding of field work**
4. **No outbreaks of COVID-19 < 1st month**
5. **"Brought calmness to the team"**

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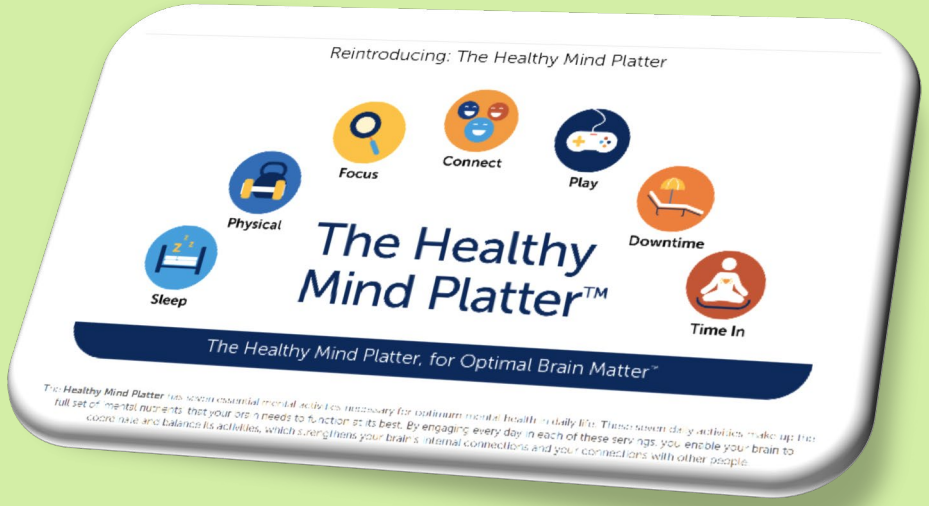
Lessons Learned



Source: https://neuroleadership.com/healthymindplatter

1. **Communication is critical!**
2. **Must be agile and "FEMA flexible"**
3. **Expect the unexpected**
4. **Disasters are fast-paced, chaotic, & high pressure**
5. **Make self-care & pacing yourself a top priority**

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headspace

Emotional Intelligence (EI)

Yoga

Mindfulness

Coherent Breathing

04. Heat Injury & Illness Prevention Special Emphasis Program (SEP)

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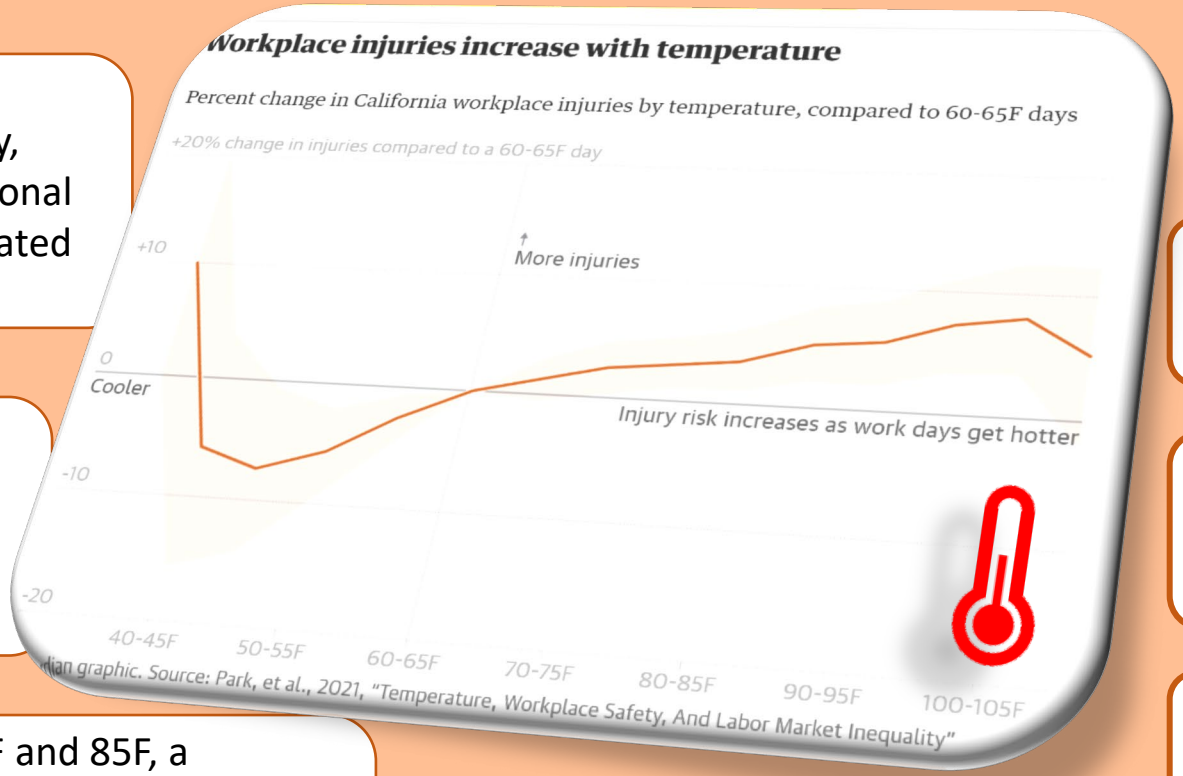
Temperature, Workplace Safety and Labor Market Inequality

Hotter temperature increases workplace injuries significantly, causing approx. 20,000 additional injuries per year and an estimated social cost of $1 billion.

Data covering the universe of injury claims from the nation's largest worker's compensation system (2001-2018)



On days between 80F and 85F, a worker's risk of injury increases by about 3.5% compared with a day in the 60s. On a day between 90F to 95F, the injury risk increases about 7%.

The effects persist in both outdoor and indoor settings.

Major Findings:

1. Hotter temperature significantly increases the likelihood of injury on the job.

2. Temperature exposure at work may exacerbate trends in labor market inequality.

3. Analyses shed light on the potential for adaptation to climate-related workplace risks.

Source: https://ftp.iza.org/dp14560.pdf

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Heat Injury & Illness Prevention: Special Emphasis Program (SEP)

Project Proposal

Description: Develop a program for monitoring heat stress & strain including intervention and controls to prevent workers from adverse health outcomes.

Need: This program will add value to existing FEMA SOPs and other resources or activities by OSHA and other organizations. Heat stress has killed 907 workers from 1992 - 2019.

OSHA Emphasis Area: Heat Injury & Illness Prevention in Outdoor and Indoor Work Settings Advance Notice of Proposed Rulemaking (10/27/21).

Timeline: Project completed by the end of CY 2022.

Raising Awareness

Share information on OSHA's regulatory agenda and opportunities to participate in the rulemaking process.

Developing compliance assistance materials for affected work force.

Participate in various forums and groups to discuss ways of improving workplace safety and health programs.

Human Performance, Resiliency & Mind Tactics

Raising Awareness Map

Raising Awareness Map

Worker Participation

Focus Groups: Seek input & feedback on heat stress & strain SOPs and field implementation

Heat Stress & Strain Safety Committees

Develop Customer Personas using Customer Experience (CX) concepts to better understand affected employees

Focusing on employee health and wellness emphasizing personal resilience (Objective 3.2 of 2022 - 2026 FEMA Strategic Plan)

Worker Participation Map

Worker Participation Map

Program Development

Enhanced SOPs and tools for Fixed Sites and Disaster Operations.

Conduct Best Practice Seminars including how to use the OSHA-NIOSH Heat Tool App in the field.

Include protection from solar radiation to prevent the incidence of skin cancers among outdoor emergency response workers.

Error Tolerance & Robust Systems

Program Development Map

Program Development Map

Physiologic & Exposure Monitoring

Elements of medical screening (Fit for Duty Program)

Determine if people can meet the demands and stresses of the hot job. Identify vulnerable workers.

Medical surveillance (primary prevention) with the goal of early identification of signs or symptoms that may be related to heat-related illness and prevention of adverse outcomes.

Activity trackers, smart watches, smartphones, smart clothing, etc.

Exposure Monitoring Map

Exposure Monitoring Map

Training & Education

Develop effective worker training and education programs.

Deliver worker training and education.

Courses should be customized to address the unique heat stress challenges of various workers/work conditions.

Training Map

Training Map

Mind Map created by Tim Paz, CIH
Version 0; Nov 21, 2021

Examples of Climate Impacts on Human Health

	Climate Driver	Exposure	Health Outcome	Impact
Extreme Heat	More frequent, severe, prolonged heat events	Elevated temperatures	Heat-related death and illness	Rising temperatures will lead to an increase in heat-related deaths and illnesses.
Outdoor Air Quality	Increasing temperatures and changing precipitation patterns	Worsened air quality (ozone, particulate matter, and higher pollen counts)	Premature death, acute and chronic cardiovascular and respiratory illnesses	Rising temperatures and wildfires and decreasing precipitation will lead to increases in ozone and particulate matter, elevating the risks of cardiovascular and respiratory illnesses and death.
Flooding	Rising sea level and more frequent or intense extreme precipitation, hurricanes, and storm surge events	Contaminated water, debris, and disruptions to essential infrastructure	Drowning, injuries, mental health consequences, gastrointestinal and other illness	Increased coastal and inland flooding exposes populations to a range of negative health impacts before, during, and after events.
Vector-Borne Infection (Lyme Disease)	Changes in temperature extremes and seasonal weather patterns	Earlier and geographically expanded tick activity	Lyme disease	Ticks will show earlier seasonal activity and a generally northward range expansion, increasing risk of human exposure to Lyme disease-causing bacteria.
Water-Related Infection (*Vibrio vulnificus*)	Rising sea surface temperature, changes in precipitation and runoff affecting coastal salinity	Recreational water or shellfish contaminated with *Vibrio vulnificus*	*Vibrio vulnificus* induced diarrhea & intestinal illness, wound and bloodstream infections, death	Increases in water temperatures will alter timing and location of *Vibrio vulnificus* growth, increasing exposure and risk of waterborne illness.
Food-Related Infection (*Salmonella*)	Increases in temperature, humidity, and season length	Increased growth of pathogens, seasonal shifts in incidence of *Salmonella* exposure	*Salmonella* infection, gastrointestinal outbreaks	Rising temperatures increase *Salmonella* prevalence in food; longer seasons and warming winters increase risk of exposure and infection.
Mental Health and Well-Being	Climate change impacts, especially extreme weather	Level of exposure to traumatic events, like disasters	Distress, grief, behavioral health disorders, social impacts, resilience	Changes in exposure to climate- or weather-related disasters cause or exacerbate stress and mental health consequences, with greater risk for certain populations.

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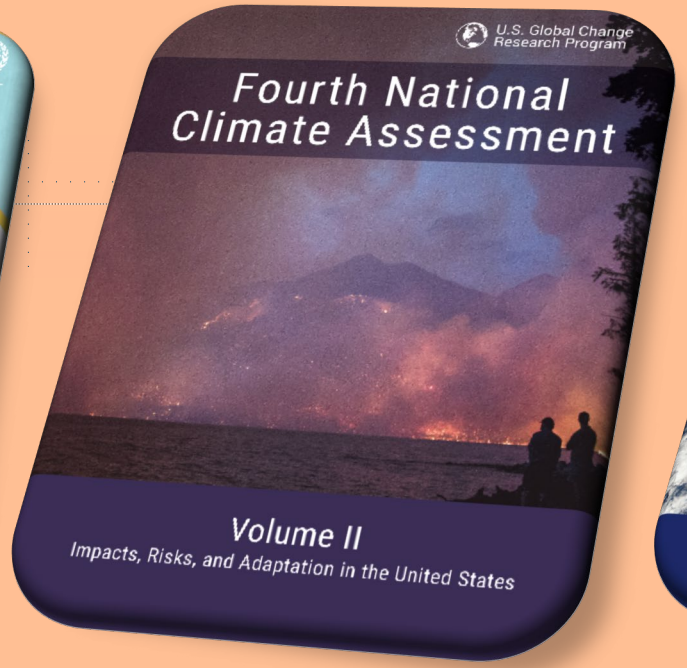
Suggested Reading



BRIEFING ROOM

FACT SHEET: Biden Administration Mobilizes to Protect Workers and Communities from Extreme Heat

SEPTEMBER 20, 2021 • STATEMENTS AND RELEASES

To better protect heat-exposed workers, OSHA is:

- **Forming a heat work group to engage stakeholders and inform ongoing efforts:** Within OSHA's National Advisory Committee on Occupational Safety and Health (NACOSH), OSHA is forming a Heat Illness Prevention Work Group to provide better understanding of challenges and best practices in protecting workers from heat hazards. This group will include three members of the full NACOSH—a public representative, labor representative, and management representative—as well as new members from a range of sectors and industries. OSHA will convene periodic meetings of the work group to provide diverse perspectives on topics including identification, monitoring, and response to workplace heat hazards; heat emergency response plans; and worker training and engagement.

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NIHHIS National Integrated Heat Health Information System

HOME | NEWS & EVENTS | URBAN HEAT ISLANDS | EXPERIMENTAL TOOLS & INFORMATION | PLANNING & PREPARING | ABOUT NIHHIS | JOIN MAILING LIST

Participating agencies: ASPR | CDC | EPA | FEMA | NIOSH | NOAA | OSHA | SAMHSA

The National Integrated Heat Health Information System (NIHHIS) National Meeting

Empowering participants with resources and a strong network that supports actions to enhance community and institutional resilience to extreme heat.

April 26-28, 2022

We are pleased to announce the first NIHHIS National Meeting (April 26-28, 2022)! The meeting is designed to bring together multiple stakeholders (federal agencies, state and local government, private and public partners, community leaders) to:

- Learn about and leverage heat and health activities, opportunities, and resources
- Expand and strengthen partnerships and networks, and
- Foster a shared vision and path forward for equitable, heat resilient communities

Register for the Meeting

View the Agenda

Contact NIHHIS

Email: nihhis@noaa.gov

About NIHHIS

NIHHIS is an integrated system that builds understanding of the problem of extreme heat, defines demand for climate services that enhance societal resilience, develops science-based products and services from a sustained climate science research program, and improves capacity, communication, and societal understanding of the problem in order to reduce morbidity and mortality due to extreme heat. NIHHIS is a jointly developed system by the Centers for Disease Control and Prevention (CDC) and the National Oceanic and Atmospheric Administration.

Who Should Come to the NIHHIS National Meeting?

The NIHHIS National Meeting is open to anyone who is working to address the health impacts of extreme heat. This includes, but is not limited to, federal agencies who are part of NIHHIS and the White House Interagency Working Group on Extreme Heat, state and local governments and organizations (esp. Chief Resilience Officers, city planners, public health officials), Tribal officials, community-based organizations, cities that are part of the Urban Heat Island (UHI) mapping campaigns, international partners, private and public sector NIHHIS partners, organizations that support NIHHIS legislation, and heat and health researchers and academics.

What are the Themes of the NIHHIS National Meeting?

While the meeting will be covering many different topic areas surrounding heat and health, the thematic areas of the conference are: **Defining the Problem** (day 1), **Building Equitable Community Resilience** (day 2), and **Building Equitable Human Resilience** (day 3).

The sessions of the NIHHIS National Meeting will be recorded and posted to our website and Youtube page following the conclusion of the meeting.

05. Wrap Up

- Bringing resiliency to emergency management
- Safety and IH at Responder Camps

My Top Priorities:

- *Heat Injuries & Illness Prevention SEP*
- *Improve Readiness Posture*
- *CBRNE / Radiological Incident Planning*
- *Better Characterization of Exposures*

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Resources and Getting Involved

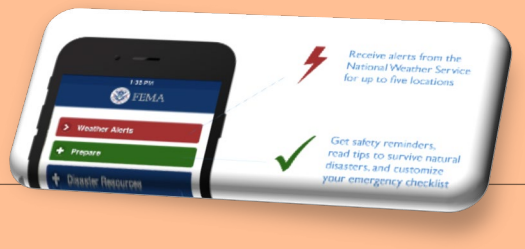
ChemResponder

ChemResponder

CBRNResponder

RadResponder

1. **FEMA Mobile App**



2. **Responder Apps**
3. **CBRN Responder Website**
4. **FEMA National Advisory Council***
5. **Ready.gov**
6. **Ready Kids.gov**
7. **Private Industry Support @ Disasters**

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***Apply by 03/31/2022**

Links to Resources

- FEMA Strategic Plan 2022 – 2026
- Billion-Dollar Weather and Climate Disasters
- FEMA National Advisory Council – Apply by March 31, 2022
- Ready.gov & Ready Kids
- National Integrated Heat Health Information System (NIHHIS)
- NIHHIS National Meeting: April 26t – 28th, 2022
- Interagency Crosscutting Group on Climate Change and Human Health (CCHHG) | GlobalChange.gov
- Biden Administration Mobilizes to Protect Workers and Communities from Extreme Heat | The White House
- The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment (globalchange.gov)
- Working on A Warmer Planet
- Fourth National Climate Assessment
- Climate Science Special Report
- CBRN Responder
- Study: Temperatures, Workplace Safety, and Labor Market Inequality
- New Understandings in Heat Stress

Building the FEMA our Nation Needs and Deserves

Thank You

Timothy Paz, CIH
Timothy.Paz@fema.dhs.gov

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