Mike Kassman
OSHA and Disaster Response Training Director
HURRICANES
SAFFIR-SIMPSON HURRICANE SCALE

STORM SURGE (ft)

WIND SPEED (mph)

PRESSURE (mbars)

1. MINIMAL
2. MODERATE
3. EXTENSIVE
4. EXTREME
5. CATASTROPHIC

Graphic Design By RL. Shepherd
<table>
<thead>
<tr>
<th>Category</th>
<th>Winds (MPH)</th>
<th>Damage</th>
<th>Storm Surge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>74 - 95</td>
<td>Minimal: Damage to unanchored mobile homes, vegetation &amp; signs. Coastal road flooding. Some shallow flooding of susceptible homes.</td>
<td>4 - 5 feet</td>
</tr>
<tr>
<td>2</td>
<td>96 - 110</td>
<td>Moderate: Significant damage to mobile homes &amp; trees. Significant flooding of roads near the coast &amp; bay.</td>
<td>6 - 8 feet</td>
</tr>
<tr>
<td>3</td>
<td>111 - 130</td>
<td>Extensive: Structural damage to small buildings. Large trees down. Mobile homes largely destroyed. Widespread flooding near the coast &amp; bay.</td>
<td>9 - 12 feet</td>
</tr>
<tr>
<td>4</td>
<td>131 - 155</td>
<td>Extreme: Most trees blown down. Structural damage to many buildings. Roof failure on small structures. Flooding extends far inland. Major damage to structures near shore.</td>
<td>13 - 18 feet</td>
</tr>
<tr>
<td>5</td>
<td>More than 155</td>
<td>Catastrophic: All trees blown down. Some complete building failures. Widespread roof failures. Flood damage to lower floors less than 15 feet above sea level.</td>
<td>Greater than 18 feet</td>
</tr>
</tbody>
</table>
In collaboration with the National Institute of Environmental Health Sciences (NIEHS) National Clearinghouse, CPWR created a Disaster Preparedness App

- Available on Google and Apple
- Provides easy access to training tools and health and safety guidance for those involved in disaster response and cleanup activities following a variety of catastrophic events.
Overview

- Introduction
- Hazards
- Other Protective Measures
- Summary
Workers’ Rights

What are employers' responsibilities?

The Occupational Safety and Health Act requires employers to provide a safe and healthful workplace free of recognized hazards and to follow OSHA standards. Employers' responsibilities also include providing training, medical examinations and recordkeeping.

For more information about OSHA, go to http://www.osha.gov or call 1-800-321-OSHA (6742)
Incident Command

Incident Command provides a structure to promote effective coordination among responders.

- Allows for an integrated organizational structure not hindered by jurisdictional boundaries.
- Has 5 organizational functions to allow for a manageable span of control:
  - Command
  - Operations
  - Planning
  - Logistics
  - Finance and Administration
- Safety is part of the Command function.
Incident Command System Structure

Command Staff

- Incident Commander
  - Safety
  - Information
  - Liaison
    - Operations
    - Planning
    - Logistics
    - Finance and Administration
Potential Chemical Exposures

**Symptoms**: Eye, nose, throat, upper respiratory tract, and skin irritation; flu like symptoms; central nervous system depression, fatigue, loss of coordination, memory difficulties, sleeplessness, mental confusion. Chronic effects depend on the extent and the duration of exposure.

**Jobs affected**
- Debris removal
- Site clean-up

**Protection**
- Hazard specific as identified by supervisor or safety officer
Hazard: Mold

After hurricanes and floods, the water creates the perfect environment for mold to grow in homes and other buildings. Exposure to mold can cause wheezing and severe nasal, eye and skin irritation.
Hazard: Trench Foot (Immersion Foot)

- Trench foot, also known as immersion foot, occurs when the feet are wet for long periods of time. It can be quite painful.
- Symptoms include a tingling and/or itching sensation, pain, swelling, cold and blotchy skin, numbness, and a prickly or heavy feeling in the foot. The foot may be red, dry, and painful after it becomes warm. Blisters may form, followed by skin and tissue dying and falling off. Obtain medical assistance as soon as possible.
- To prevent trench foot, when possible, air-dry and elevate your feet, and exchange wet shoes and socks for dry ones.
Hazard: Blood-borne Disease

- Use impervious gloves when handling human remains
- Replace gloves if punctured or torn
- Protect yourself from injured persons’ blood and bodily fluids
- Do not handle human remains if you have skin cuts or punctures
Hazard: Handling Bodies of Victims

- There is no direct risk of infectious disease from being near human remains for people who are not directly handling dead bodies.

- Human remains may contain blood-borne viruses such as hepatitis viruses and HIV, and bacteria that cause diarrheal diseases, such as shigella and salmonella.

- For personnel exposed to blood and body fluids:
  - Use gloves when handling bodies or body fluids
  - Use eye protection, gowns, and masks when large quantities or splashes of blood are anticipated
  - Wash hands frequently
  - Use body bags to reduce the risk of contamination
Hazard: Animals and Insects

- Beware of wild or stray animals:
  - Avoid wild or stray animals. Call local authorities to handle animals
  - Get rid of dead animals according to local guidelines
  - Wear and clean proper protective clothing when handling carcasses

- Spiders (black widow and brown recluse spiders)

- Fire ants
Hazard: Animals and Insects

Protect yourself from mosquitoes:

- Use screens on dwellings
- Wear long pants, socks, and long-sleeved shirts
- Use insect repellents that contain DEET or Picaridin
Hazard: Snakes and other reptiles

- Be on the alert for snakes that may be hiding in unusual places after flooding
- Wear snake chaps
- If you are bitten, seek immediate medical attention
Other Protective Measures

Key items to have:

- Personal floatation device
- Earplugs
- Bottled water
- Sun screen
- Rain Gear
- Pocket Knife
- Insect repellent with Deet or Picaridin
- PPE – For additional information on what equipment you need for protection, contact your local OSHA office or NIOSH
OSHA Resources

Occupational Safety and Health Administration

Hurricane Preparedness and Response

Response/Recovery

OSHA's Hurricane eMatrix outlines the activities most commonly performed during hurricane response and recovery work and provides detailed information about the hazards associated with those activities. The eMatrix is designed to help employers make decisions to protect workers and offers recommendations for personal protective equipment, safe work practices, and precautions for each activity.

Additional Information:

- Hurricanes. Environmental Protection Agency (EPA)
OSHA Resources

OSHA QuickCards™

- Aerial Lifts | Spanish
- Carbon Monoxide Poisoning | Spanish
- Chain Saws | Spanish | Portuguese
- Chipper Machine Safety | Spanish | Portuguese
- Construction Hazards (Top Four)
- Construction PPE | Spanish
- General Decontamination | Spanish | Portuguese
- Demolition Safety | Spanish | Portuguese
- Electrical Safety | Spanish
- Filling, Moving and Placing Sandbags
- Hand Hygiene and Gloves | Spanish | Portuguese
- Heat | [More...]
- Sun | Spanish
- Hydrogen Sulfide | Spanish
- Lead in Construction | Spanish
- Mold | Spanish | [More...]
- Permit-Required Confined Spaces | Spanish
- Portable Generator Safety | Spanish
- Portable Ladder Safety
- Rescue of Animals (Dogs)
- Respirators | Spanish | Portuguese
- Rodents, Snakes and Insects | Spanish | Vietnamese
- Tree Trimming and Removal Safety | Spanish | Vietnamese | Portuguese
- West Nile Virus | Spanish
- Work Zone Traffic Safety | Spanish
OSHA Fact Sheets

- Aerial Lifts
- Atmospheric Testing in Confined Spaces
- Black Widow Spider
- Brown Recluse Spider
- Chain Saw Safety | Spanish
- Cleanup Hazards | Spanish | Portuguese
- General Decontamination
- Demolition and Cleanup
- Downed Electrical Wires
- Working Safely with Electricity | Spanish
- Falls
- Filling, Moving and Placing Sandbags
- Fire Ants
- Flood Cleanup
- Fungi Hazards | Spanish | [More...]
- Grounding Portable Generators
- Hand Hygiene and Gloves
- Handling Human Remains
- Heat Safety | Spanish | [More...]
- Disaster Cleanup and Recovery PPE Matrix | Spanish
- Keeping Workers Safe during Disaster Cleanup and Recovery | Spanish
- Hydrogen Sulfide
- Lead Hazards
- Lead in Construction
- Lockout/Tagout | Spanish
- Mass Care Shelter Occupational Hazards
- Mold Hazards during Disaster Cleanup
- Portable Generator Safety
- Safety and Health Checklist
- Search and Rescue
- Tree Trimming Safety | Spanish
- Trenching and Excavation Safety
- West Nile Virus
- Working Outdoors
- Work Zone Traffic Safety
Aerial Lifts
Atmospheric Testing in Confined Spaces
Black Widow Spider
Brown Recluse Spider
Chain Saw Safety | Spanish
Cleanup Hazards | Spanish | Portuguese
General Decontamination
Demolition and Cleanup
Downed Electrical Wires
Working Safely with Electricity | Spanish
Falls
Filling, Moving and Placing Sandbags
Fire Ants
Flood Cleanup
Fungi Hazards | Spanish
CPWR Resources

Toolbox Talks, Hazard Alert Cards & Other Resources on:

- Aerial Lifts
- Biohazard Safety
- Confined Spaces
- Falls
- Fatigue
- Histoplasmosis
- Lightning
- Lockout/Tagout
- Roof Collapse
- Trench Safety
- Working with Electricity
- Working in Cold/Hot Weather
Other Resources

Hurricane Preparedness and Response

Additional Resources

- National Hurricane Center
- Hurricanes & Floods. The National Institute of Environmental Health Sciences (NIEHS)
- Hurricanes and Other Tropical Storms. Centers for Disease Control and Prevention (CDC)
- Hurricanes. Environmental Protection Agency (EPA)
- Disasters and Emergencies. USA.gov
- Hurricane Safety. American Red Cross
- Hurricane Safety Checklist. American Red Cross
- Power Outage Safety. American Red Cross
- Slips, Trips, and Falls in the Office. Texas State Office of Risk Management
- Protecting Yourself While Removing Post-Disaster Debris From Your Home or Business. National Institute of Environmental Health Sciences (NIEMS)
- Occupational Safety and Health and Climate. National Institute for Occupational Safety and Health (NIOSH)
- Workplace Safety and Health Topic

Indoor Environmental Pollutants

An interagency indoor environmental pollutant workgroup developed guidance for employers and workers engaged in disaster recovery operations, focusing on demolition, clean-up, and rebuilding of damaged homes. Disaster recovery workers may encounter asbestos, lead, mold and radon at their work sites. The guidance from the U.S. Department of Housing and Urban Development (HUD), the U.S. Department of Health and Human Services (HHS), the Environmental Protection Agency (EPA), and OSHA provides information about these types of hazards and how to protect workers from exposure.

- Asbestos: Worker and Employer Guide to Hazards and Recommended Controls
- Lead: Worker and Employer Guide to Hazards and Recommended Controls
- Mold: Worker and Employer Guide to Hazards and Recommended Controls
- Radon: Worker and Employer Guide to Hazards and Recommended Controls
Psychological Resilience During an Emergency Response

- **Tips for Supervisors of Disaster Responders: Helping Staff Manage Stress When Returning To Work. Substance Abuse and Mental Health Services Administration (SAMHSA)**
- **A Guide to Managing Stress in Crisis Response Professions (2005). Substance Abuse and Mental Health Services Administration (SAMHSA).** This SAMHSA pocket guide provides first responders with information on signs and symptoms of stress and offers simple, practical techniques for minimizing stress responses prior to and during a disaster response.
- **Field Manual for Mental Health and Human Service Workers in Major Disasters. Substance Abuse and Mental Health Services Administration (SAMHSA)**
- **Disaster Responders-SAMHSA Disaster Behavioral Health Information Series Installment. Substance Abuse and Mental Health Services Administration (SAMHSA)**
- **Psychological First Aid for First Responders. Substance Abuse and Mental Health Services Administration (SAMHSA)**
- **Tips for Disaster Responders: Understanding Compassion Fatigue. Substance Abuse and Mental Health Services Administration (SAMHSA)**
- **A Post-Deployment Guide for Supervisors of Deployed Personnel. Substance Abuse and Mental Health Services Administration (SAMHSA)**
- **Introduction to Disaster Behavioral Health Webinar. Substance Abuse and Mental Health Services Administration (SAMHSA)**
- **Health, Safety, and Resilience for Disaster Responders. Centers for Disease Control and Prevention (CDC)**
- **Surviving Field Stress For First Responders. Centers for Disease Control and Prevention (CDC)**
- **Traumatic Incident Stress: Information for Response Workers. National Institute for Occupational Health (NIOSH), CDC**
- **Psychological First Aid Manual. U.S. Department of Veteran Affairs**
- **SAMHSA’s Efforts for Disaster Preparedness, Response, and Recovery Website. SAMHSA coordinates behavioral health resources to help responders and communities prepare, respond, and recover from disasters.**
- **Coping with a Disaster or Traumatic Event. Centers for Disease Control and Prevention (CDC). Provides general strategies for promoting mental health and resilience that were developed by various organizations based on experiences in prior disasters.**

The SAMHSA Disaster Distress Helpline is a national hotline dedicated to providing year-round immediate crisis counseling for people who are experiencing emotional distress related to any natural or human-caused disaster. This toll-free, multilingual, and confidential crisis support service is available to all residents in the United States and its territories. Stress, anxiety, and other depression-like symptoms are common reactions after a disaster. Call 1-800-985-5990 or text TalkWithUs to 66746 to connect with a trained crisis counselor.
FEMA App

The FEMA App is a great resource of information. Features of FEMA’s app include: Alerts and safety messages from the National Weather Service (for up to five locations across the U.S.); upload and share photos of damage and recovery efforts; maps of disaster resources; apply for assistance; save custom emergency safety information such as custom list of items in your family’s emergency kit, as well as the places you will meet in case of an emergency, and receive safety and preparedness reminders and learn how to stay safe before, during, and after over 20 types of hazards, including floods, hurricanes, tornadoes and earthquakes. All features of the app are available in English or Spanish.
Summary

- The hazards and issues are dynamic and require vigilance and flexibility.
- The key to a safe response is attention to the safety issues of your work environment.
- The physical hazards are similar to any construction or demolition site.
- The health hazards include the hazards associated with the environment.