# **Urban Flooding Hazards**

David Chawaga | FEMA Environmental safety and Health



#### Introduction

- Disasters are a unique work environment;
- Traditional Job Hazard Analysis usually do not account for a post-disaster work environment
- All hazards are manageable with your ability to properly anticipate, recognize and control
- What Lessons Learned can apply to Industry





#### What to Expect

- Resources affected by availability/movement
- Structural hazards
- Debris lots of it;
- Communication will not exist;
- Roads damaged and may be blocked;
- Bridges out;
- Electricity out;
- Building stability collapse, facades unstable;
- Building Interior uninhabitable;
- Derailed railroads.





### **Types of Hazards**

- PhysicalEnvironmental
- Flora
- Fauna
- Radiological Microbial





### Day 1 - Getting to Work

- Road Closure
- Signals Not Operational
- High Water
- No Fuel
- Road Signs Down
- No GPS
- Quick Stops
- Drivers Not Focused on Surroundings
- Drivers On Phone
- No Parking





#### **Flood**

- Disruption of water purification and sewage disposal systems
- Overflowing of toxic waste sites
- Dislodgement of chemicals previously stored above ground
- Agricultural and industrial chemicals
- Electrical from downed power lines
- Floodwaters often contain infectious organisms:
- Intestinal bacterial E.coli, Salmonella, Hepatitis A Virus, agents of typhoid and tetanus





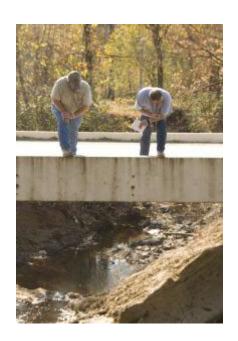
#### Flood (cont)

- Standing water breeding grounds for mosquitoes: encephalitis, West Nile Virus
- Confused animals: bites, fleas, ticks
- Microbial growth

#### General:

- Washing hands
- Know food source
- Rubber gloves, boots
- Insect repellants





### **Site Damage**

- Travel in pairs;
- Tripping hazards will be everywhere on sidewalks, and streets;
- Construction vehicles will not see you;
- Have full situational awareness of your surroundings;
- You are a pedestrian and equipment may not stop.
- Rules of the road will not apply very fast paced





#### **Animal**

Animals will be lost, hungry and upset – both pets and livestock

- Broken fences (rural);
- Garbage;
- Territory;
- Abrupt Change in Habitat

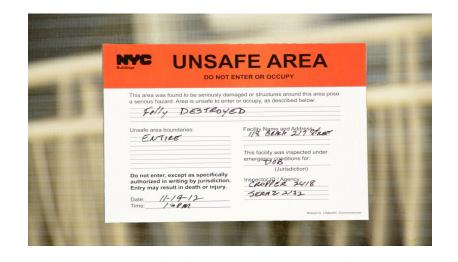




## **Avoiding Debris Hazards**

- Ask yourself "why do I need to be on debris"?
- Assume hazardous materials;
- Assume physical hazards specifically nails as you walk;
- You will need specific personal protective equipment to work with debris.







### **High Rise Neighborhoods**

- Have full situation awareness;
- Announce yourself;
- Tripping on stairs;
- Travel in pairs;
- Vertical walking;
- Buildings may have no power (flashlight).

