

# Urban Flooding Hazards

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# Introduction

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- 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



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# What to Expect

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- 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.



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# Types of Hazards

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- Physical
- Environmental
- Flora
- Fauna
- Radiological
- Microbial



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# Day 1 - Getting to Work

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- 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

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- 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)

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- 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

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- 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



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# Animal

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

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



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# 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.

A photograph of a yellow and white "UNSAFE AREA" sign from NYC Buildings. The sign has an orange header with "NYC Buildings" and "UNSAFE AREA" in bold, followed by "DO NOT ENTER OR OCCUPY". The main body of the sign contains a warning: "This area was found to be seriously damaged or structures around this area pose a serious hazard. Area is unsafe to enter or occupy, as described below:". Below this, the word "Fully DESTROYED" is handwritten. The sign also includes fields for "Unsafe area boundaries:" (with "ENTIRE" handwritten), "Facility Name and Address:" (with "118 BEEKMAN STREET" handwritten), "This facility was inspected under emergency conditions for:" (with "DOB" handwritten), "Inspector ID / Agency:" (with "CHOWDER 2418" handwritten), "Date:" (with "11-19-12" handwritten), and "Time:" (with "1:20 PM" handwritten). A small note at the bottom right reads "Do not enter, except as specifically authorized in writing by jurisdiction. Entry may result in death or injury." and the signature of Robert D. L. Mandin, Commissioner, is visible.

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# High Rise Neighborhoods

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



Battery Park Underpass - New York City, New York



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