

# FLOOD ISSUES



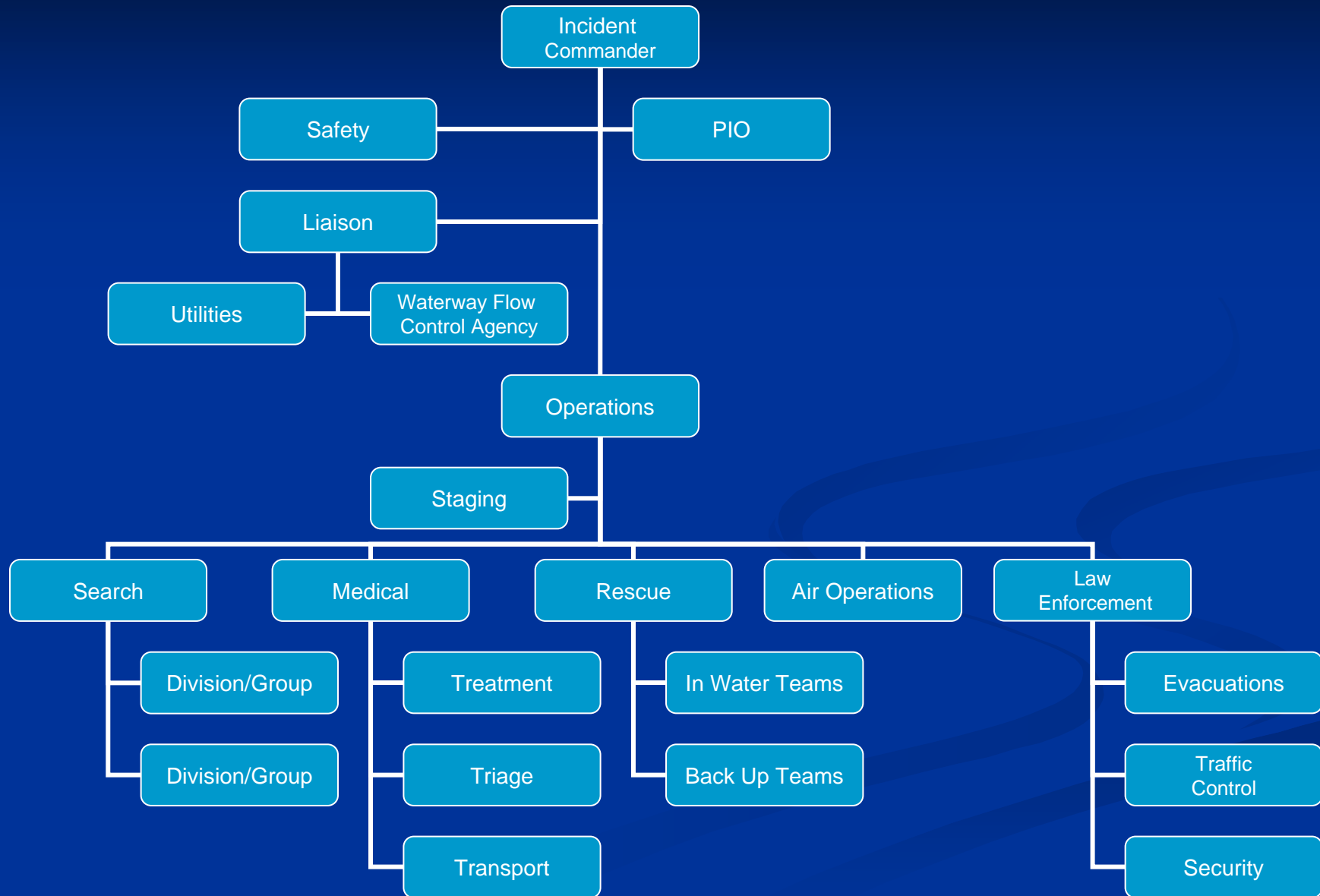


# Course Objectives

- Size up considerations
- Water and Geographical Evaluation
- Insight into Operational Considerations
- Hazardous Materials Considerations



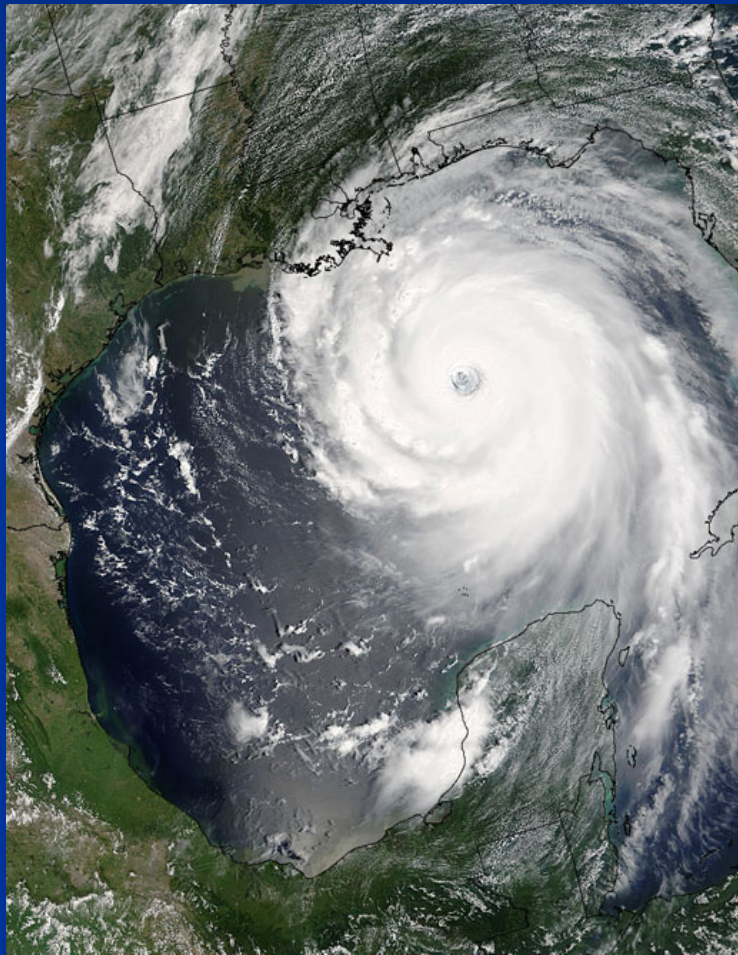
# Flood Rescue ICS





# Katrina

## 32,000+ rescues performed



September 15, 2005



September 7, 2005



# Recent Large Scale Flood Activity

- Northern California 1955, 1964, 1974, 1986
- Central Valley – 1997 Chico to Salinas
- Delta- 2004
- Southern California Summer 2005
- Northern California Winter 2005-2006



# Water / Geographical Area Evaluation

- Changing Weather Patterns
- Changing Water Patterns
  - Reservoir release, tides and water inflow
  - Flood History of area
- Swift water
- Insect/Animal Exposure
- Contamination- Haz-Mat



# Water Evaluation cont.

- Is the water contaminated?
- What type of contaminants?
- Where has flooding occurred?
- What has the flooding involved?
- What is being covered up?





# Water Evaluation cont.

- What is the content of the water?
  - Flood debris
  - Surface load
    - debris, deceased animals, humans, and anything that floats
  - Suspended Load
    - Objects that are neutrally buoyant
  - Bottom Load
    - All things that have become negatively buoyant (on bottom)





# Causes of Levee Failure

- Seepage through or under the levee heavy enough to cause a “boil”.
  - Caused by burrowing animals or decomposing tree roots
- Erosion of the levee due to swift moving water or wave action.
  - Overtopping, by high water or wind wave action



# Hydraulic Force

- Pressure of water on inanimate objects can be substantial
- Calm looking water is deceptive – it can have a very strong current
  - The force of water will displace soil from under roadways, bridges, and underground spaces
  - It can move any object including houses, bridges, vehicles, fire engines, etc.



# Rescue Considerations in Static Flood Water

- Flooded area
  - Acquire a map of area
  - Make contact with local owners and rescuers that can direct you in unfamiliar areas
  - Know your objectives
    - Search
    - Rescue
    - Recovery
  - You should be trained at the Operational Level before entering any water
    - Including Shallow Water Crossings





# Structure Fires

- Structure Fires
  - Can and will happen
  - Plan on defensive mode
  - **DO NOT** wear structure PPE in moving water
  - Water rescue type helmet
  - Floto/Portable pumps can be used to augment water supply





# Hazardous Materials Considerations

- Consider flood situations to be Haz-Mat and Biohazard situations
- Decontamination should be done after entry into flood water environment
  - Soap and water will remove most products



# Resources to Consider

- Resources
  - Local & state law enforcement
  - Heavy equipment owners/operators
  - Local advanced water rescue teams
  - Local air resources (rotary and fixed)
  - Haz-Mat Teams
  - Army National Guard
  - State OES/USAR Teams
  - Federal Teams



# Useful Links

- National Weather Service [www.noaa.gov](http://www.noaa.gov)  
Large site w/ many useful links; flows, tides, etc.
- Department of Water Resources [www.dwr.water.ca.gov](http://www.dwr.water.ca.gov)  
Information on flows, releases, and historical reference
- California Data Exchange Center  
<http://cdec.water.ca.gov>
- [www.usgs.gov](http://www.usgs.gov)
- [www.dreamflows.com](http://www.dreamflows.com) (major and minor streams)