



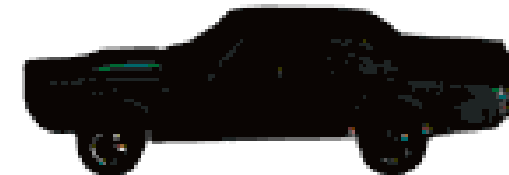
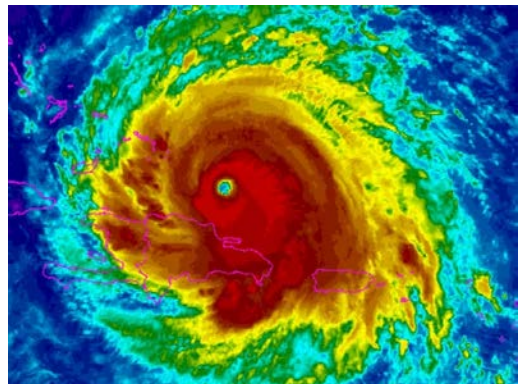
South Carolina Department of Health and Environmental Control

SC DHEC Operations During Emergencies

Richard Welch, PE, Manager
Drinking Water Permitting & Compliance Section

Overview

- DHEC Emergency Structure
- Case Studies
 - Flood
 - Hurricane
- Acronyms Quiz !



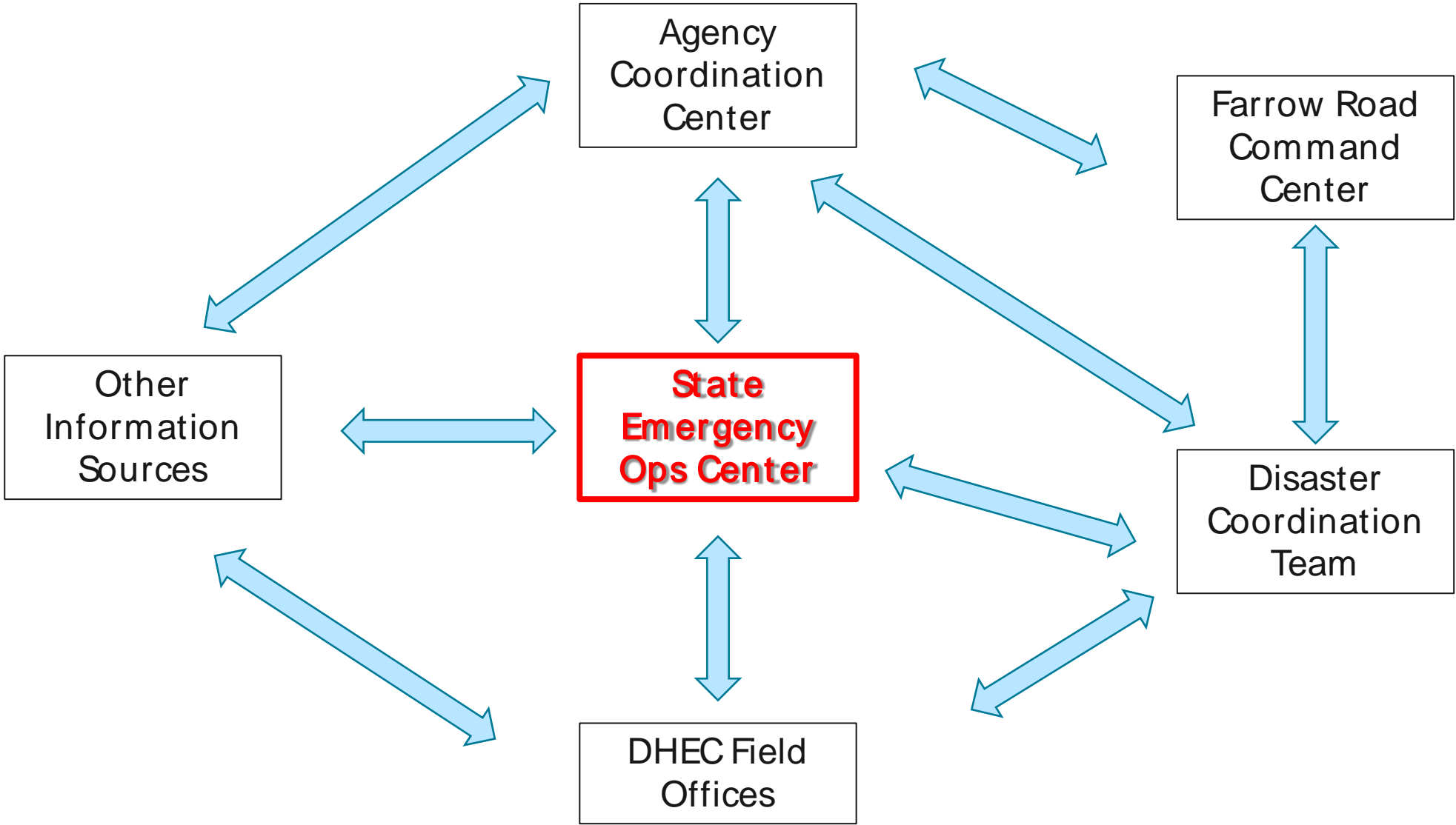
DHEC Emergency Operations Structure

- Many moving parts
 - Disaster type
 - Different areas of DHEC (personnel, teams, equipment, etc)
- Many different locations
- Many acronyms!
- Will vary according to type or severity of emergency

Structure, Acronyms, & Locations

- Agency Coordination Center (ACC) – Bull Street Main Office
- Farrow Road Command Center (FRCC) – State Park Campus
- Disaster Coordination Team (DCT) – State Park Campus
- State Emergency Operations Center (SEOC) – Springdale Armory
- Emergency Support Functions (ESF) – located at SEOC
- Dam Safety Program “war room” – Bull Street Main Office

DHEC Emergency Operations Structure



What Do They Mean?

- State Emergency Operations Center (SEOC)
 - DHEC is primary for ESF 8 & 10
 - DHEC supports ESF 3, 5, 9, & 17
- ESF 3 – Public Works & Engineering
 - Office of State Engineer
 - DHEC water & wastewater tech experts
- ESF 3 – Public Works & Engineering
- ESF 5 – Emergency Management
- ESF 8 – Public Health & Medical Services
- ESF 9 – Urban S&R
- ESF 10 – Oil & Haz Materials Response
- ESF 17 – Animal Issues

Agency Coordination Center

- Provide information to the Director's Office and the SEOC about the Department's plans and actions in response to the emergency or disaster.
- Staffed by DHEC upper management (Director, Asst. Director, Bureau Chiefs, Assistant Bureau Chiefs)
- Administrative support, financial support & decisions
- Critical decisions affecting agency operations
- Management and coordination of DHEC's environmental response to a disaster

Farrow Road Command Center

- Coordination center for ESF 10 – Hazardous waste spills & clean up as well as 24-hour emergency call number
- Staffed by DHEC Division of Emergency Response Personnel
- Work on technical and informational aspects of spill response
- Technical libraries, plume modelling, industry files, etc
- Communicate directly with field teams and DCT

Disaster Coordination Team (DCT)

- Technical experts from each program area, along with support staff, to facilitate & enable the overall environmental coordination process (big picture for environmental issues).
- Response *and* Recovery
- Staffed by technical experts
- Air, Env. Health services, Land & Waste Mgt., Water, OCRM
- Amount of staff is scaled to type and severity of disaster or emergency

Disaster Coordination Team (DCT)

- Quick and accurate interpretation of the regulations
- Emergency exemptions to regulations as needed
- Accurate technical guidance
- Make Program Area decisions for response efforts

Disaster Coordination Team (DCT)

- Coordinate individual Bureau response issues with agency wide response
- Proactive in identifying issues when a large scale disaster occurs
- Responsive to requests for assistance from affected areas
- Identify vulnerable and potentially vulnerable situations

Drinking Water

- Provide information to drinking water systems in the disaster area concerning the status of their source water (i.e. spills, etc. upstream of the intake).
- Advise on the necessity to issue public advisories concerning the safety of the water supplies in the disaster area.
- Approve temporary treatment changes to public drinking water systems.



Drinking Water

- Recommend treatment options for small water systems.
- Receive and re-direct requests from water systems for equipment, supplies, etc.
- Update ESF-3 concerning the status of public water supplies.
- Monitor & coordinate with SC WARN.



Other DHEC Components

- Dam Safety Program – Large conference room set up solely for Dam calls 😊
- Technical assistance teams (TAT) – deployed with staff from Columbia and regional offices
- Subject matter experts – DHEC non-emergency staff who can lend assistance as needed
- Outside contractors and vendors as needed

Recent Case Studies

- Pre – disaster activities
- During disaster activities
- Recovery and return to “normal”
- 2015 Flood Event
- 2016 Hurricane Matthew
- 2017 Hurricane Irma

Hurricane Joaquin & Resulting Flooding

- From Wikipedia

“Although Joaquin never directly affected the United States, another large storm system over the southeastern states drew tremendous moisture from the hurricane, resulting in catastrophic flooding in South Carolina.”

- The hurricane combined with another low pressure system caused an “atmospheric river” between the two systems

Hurricane Joaquin & Resulting Flooding

- Pre-disaster activities:

- Contacted all surface water plants to update personnel lists and who to call after the storm
- Coordinated with other areas of DHEC
- Prepared to respond



South Carolina Department of Health and Environmental Control
Pre-Landfall Hurricane Information Form

System Name:	Date & Time:
System e-mail address:	System contact name:
System Number:	System Population:
What is the location of the utility's primary command post?	
How can DHEC get in touch with someone that can update the water system status?	
Is backup power available?	
If backup power is available, has it been recently tested under load?	
If backup power is available, what is the water system capacity running on backup power?	
If backup power is not available, what are the plans for providing water?	
Are there any emergency connections with other water systems?	
Is the water system an SC-WARN member?	
Is there anything that DHEC can help with or anything the water system needs from us?	
Other Comments:	
DHEC contact information (in priority order):	
DHEC Disaster Coordination Team (Doug Kinard, Rich Welch, Shawn Clarke)	803-896-4089
DHEC Regional Contact Number	
DHEC Drinking Water Protection Division Director (Doug Kinard)	803-360-7997
DHEC Drinking water switchboard	803-898-4300

Hurricane Joaquin & Resulting Flooding

- Much damage from heavy rainfalls throughout the Midlands
- Many dam failures – domino effect
- City of Columbia – Canal plant issues

Dam Failures

- Dam Safety program was in the process of hiring additional personnel in the weeks leading up to the storm
- Magnitude of dam failures was unprecedented and unexpected
- In the aftermath, a private contractor was hired to help with mapping, etc
- Several “emergency orders” issued by DHEC requiring inspections and further actions
- Program was given priority to expand and add staff

City of Columbia – Canal Plant

- Breach in Columbia canal
- Off stream reservoir at plant site was out of service and drained for cleaning
- Attempts at building cofferdam downstream from plant intake had mixed results
- Worked w/ City staff to allow pumping directly from river into wet well
 - Fuse and install HDPE piping
 - Emergency pumps and generators at riverfront park
 - Almost lost everything in another storm weeks later!

City of Columbia

- Turbidity exceeded limits – systemwide boil water advisory
- All hospitals, restaurants, USC, citizens affected
- Hospitals
 - Temporary tanker truck loads of water
 - National Guard producing/treating water
- State Fair arriving in town!

City of Columbia

- Water Missions (through the help of Andy Fairey and others) sent a treatment unit
 - Set up in a neighborhood at an elevated tank site
 - Used a City fire hydrant as source
 - Relied on many certified operators from around the state to run system
- Water Missions was also close to putting a unit at USC for the campus and at the fairgrounds for the state fair; neither was used





Aftermath

- Dam safety program was granted additional resources, management oversight, and lots of spotlight
- DHEC drinking water staff worked closely (24/7) with City of Columbia staff and fostered a great working relationship that endures today!
- Utilities statewide came together to help their fellow brothers and sisters in need!

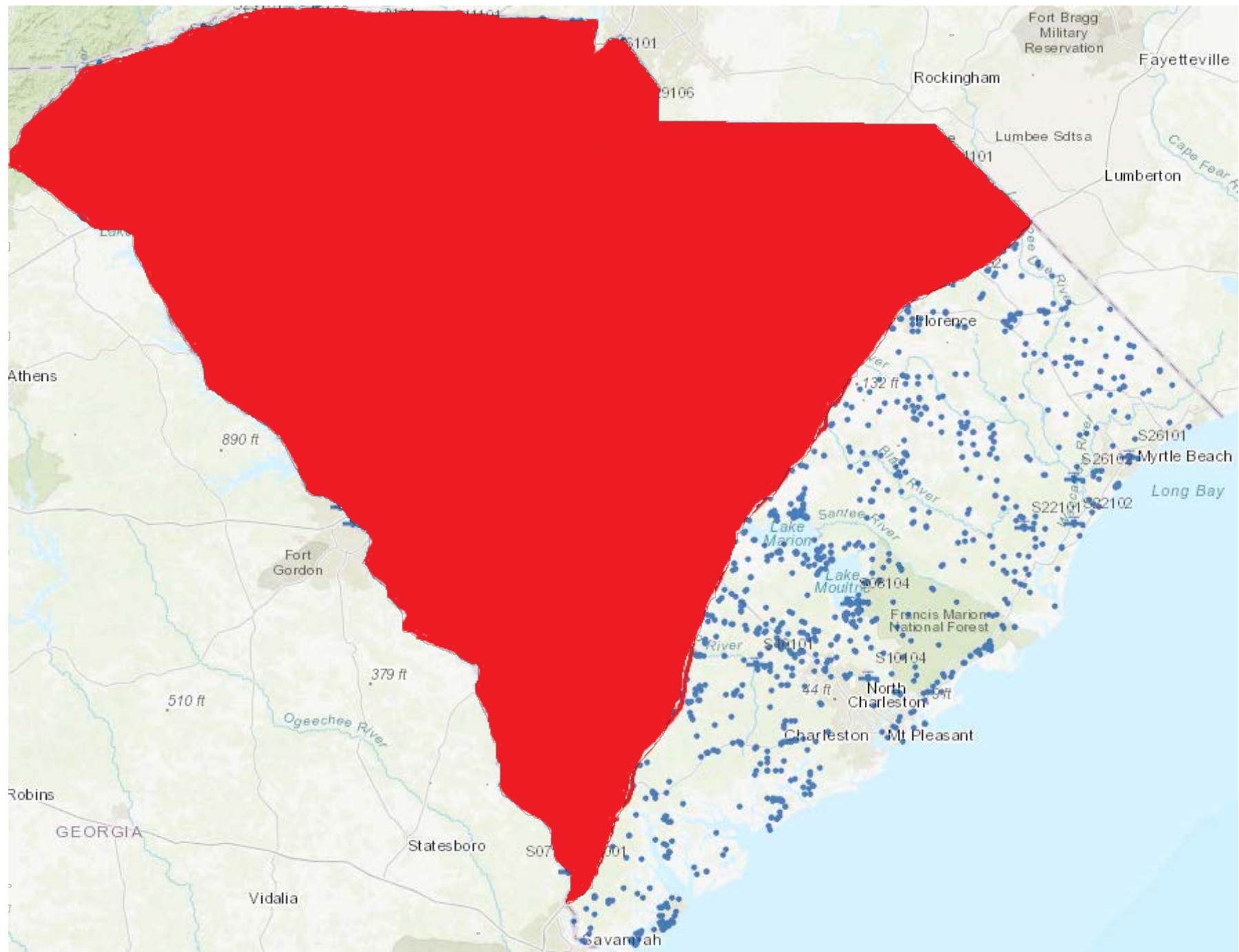
Hurricane Matthew

- Pre-disaster activities:
 - Contacted all surface water plants to update personnel lists and who to call after the storm
 - Coordinated with other areas of DHEC
 - LOTS & LOTS of focus on Dams!
 - Prepared to respond
- Pre-defined disaster area – East of I-95
 - Columbia called all surface plants
 - Regions called all others



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Hurricane Matthew

- Our initial estimate on the affected area was not accurate
 - Damage west of I-95
 - Post event flooding several days after storm passed through
- Tracking damage & loss of service
 - 3 spreadsheets to update
 - Multiple people in each constantly updating remotely
- Regular updates to SEOC for Governor's press conferences
 - How many people on Boil Water Orders?
 - How long until service restored?

Hurricane Matthew : Public Utilities

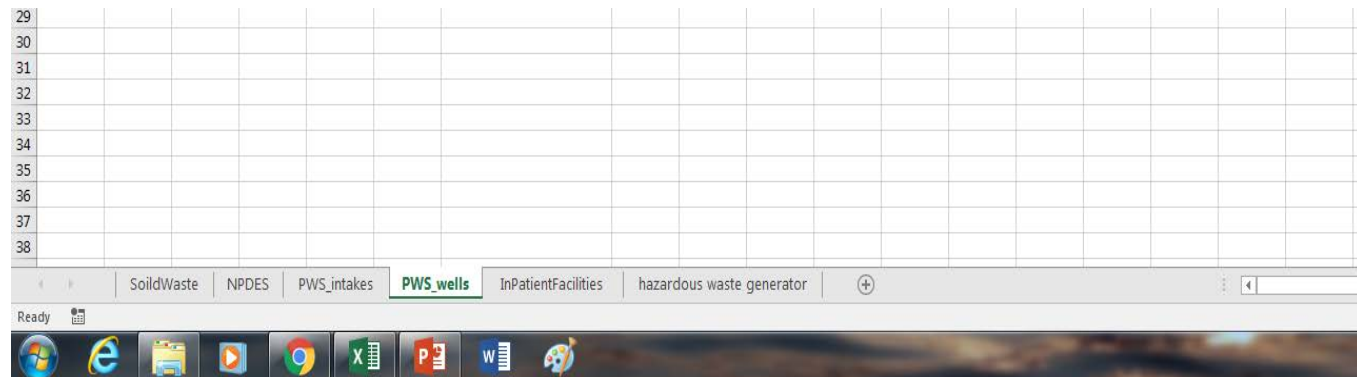
- Several issues at public utilities from Matthew
 - Beaufort Jasper activated WARN b/c of lift station issues (needed generators)
 - Pee Dee area had widespread boil water orders (~31 PWS)
 - Many public water systems lost pressure
 - Multiple private wells also flooded
 - Distribution system breaks
- Most public utilities returned to normal service within a few days

Hurricane Matthew: Town of Nichols

- Flooding in Town of Nichols
- Flooded chemical warehouse
 - Company was worried about packaging integrity
 - Release of pesticides, motor/fuel oil, insecticides, etc into floodwaters
 - Lab results took 3-days to several weeks
- Testing of floodwaters
 - Acetone, MEK, 4 unknown chemicals

Hurricane Matthew: Lessons Learned

- Too many fingers in the pie
- WARN worked! (many times)
- DHEC needed to streamline information gathering and reporting processes
- DHEC assumed where damage was going to occur
 - For pre-planning
 - Issues and challenges outside of predefined area
 - Different challenges than expected



Hurricane Irma

- Pre-disaster activities:

- Contacted all surface water plants to update personnel lists and who to call after the storm
- Coordinated with other areas of DHEC
- Prepared to respond
- Request from a SWTP to drop basins

- Lessons learned from Matthew:

- Don't assume damage area beforehand
- New reporting, tracking, etc of event
- Used e-mail to send form out and get responses



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Hurricane Irma

- E-mailing out informational sheet saved time and limited how many calls busy water systems got from DHEC
 - Limited frustration on their part. Complaints during Matthew
 - Found out many e-mail addresses weren't working – time to update!
 - Coordinated w/ regional offices to gather information before event
- Several utilities sent out pre messages to customers (George Co)
- SC RWA helped contact utilities and greatly reduced burden

Hurricane Irma

- Disaster management was much smoother
- Better information sharing led to more knowledgeable decisions
- More flooding, but less damage than Matthew in some areas



Questions?