Lorna Withrow, PE
NCDHHS, DPS, OSWP

- Review Engineer for the On-Site Water Protection (OSWP) Branch, Division of Public Health (DPH), North Carolina Department of Health and Human Services (NCDHHS)
- More than 26 years of environmental compliance experience that includes radiological waste disposal, drinking water, and wastewater
- Licensed North Carolina Professional Engineer
- B.S. in Applied Mathematics with a Nuclear Engineering concentration, North Carolina State University, Raleigh NC
- M.C.E. in Environmental Engineering, North Carolina State University, Raleigh NC

Threats Posed

- Environmental and public health threats causes:
  - Natural
  - Accidental
  - Intentional
- Examples:
  - Fires
  - Flooding
  - Tornadoes
  - Hurricanes
  - Substance releases

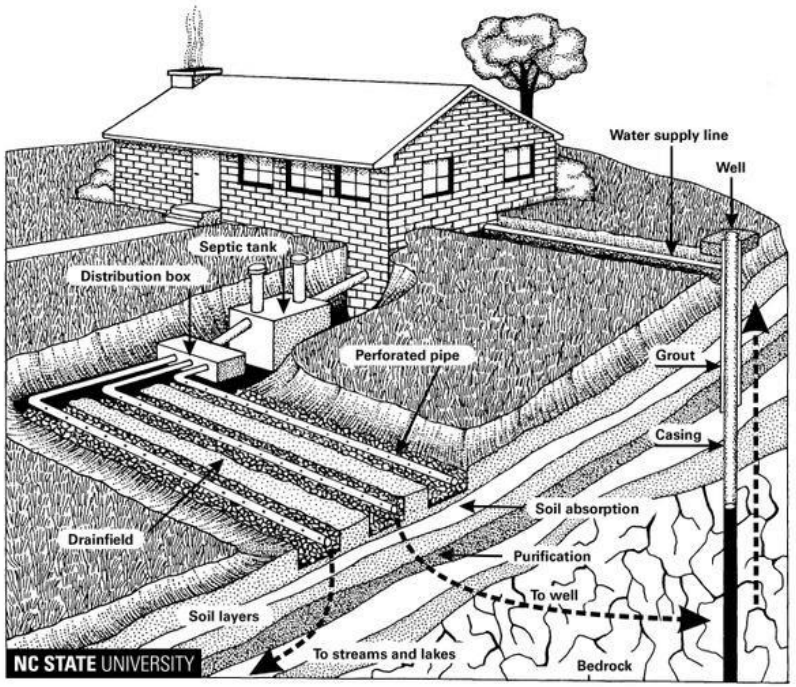
Source: Photographer: Maya Costales, Cleveland Co Fair 10-8-2017

nnah Dickson, http://bhsbroadcaster.edublogs.org/2016/11/30/fires-swr

w.independent.co.uk/news/world/americas/tornado-warning-nc-hurricane-florence-tropical-depression-north-e-fear-river-a8541876.html

In North Carolina,…

- There are subsurface wastewater systems (septic systems) in use in each of the state's 100 counties
- ~50% of homes utilize septic systems for wastewater collection, treatment and dispersal[1]
- >50% of the population gets their drinking water from groundwater sources via private or municipal wells[2]



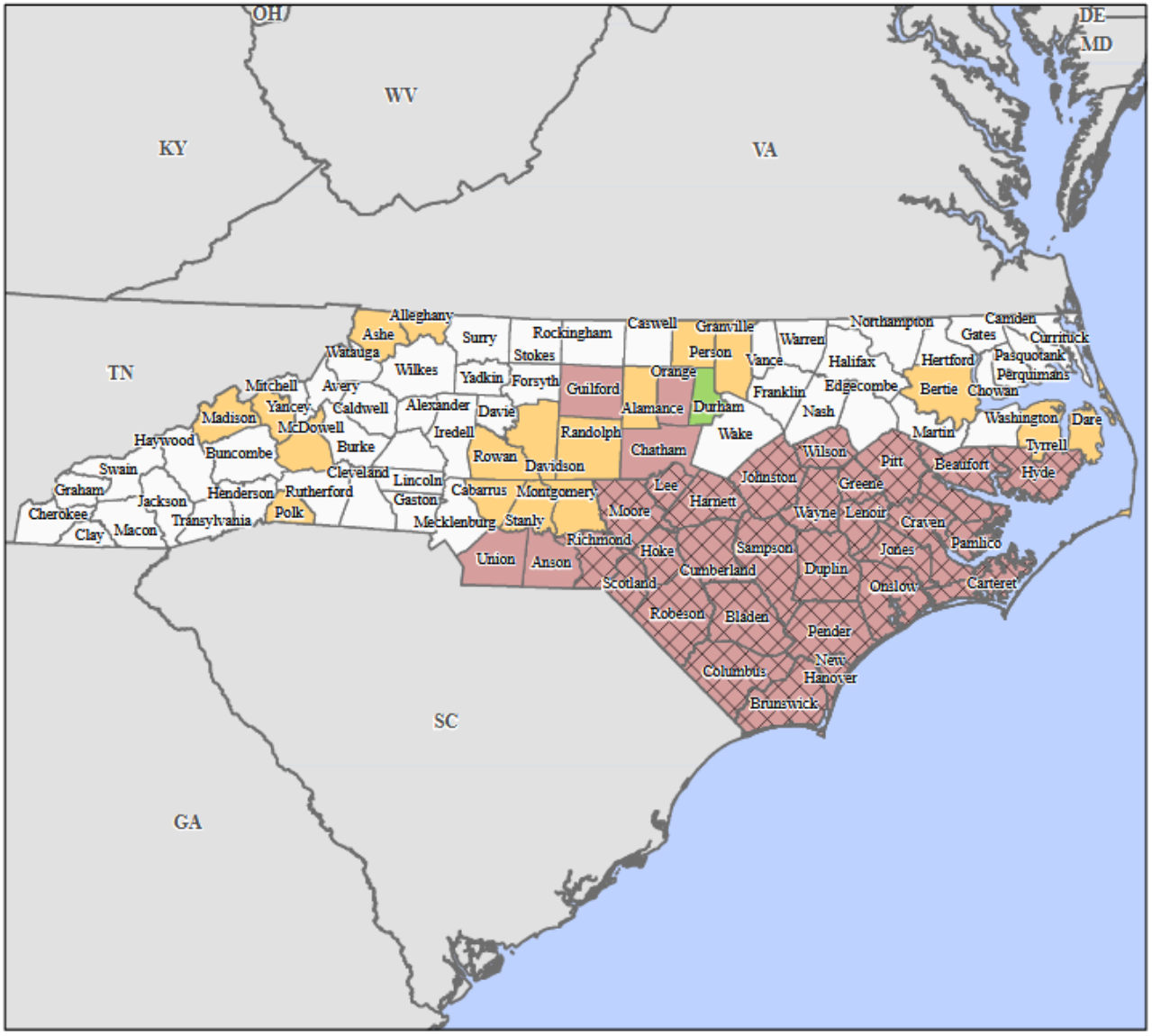
https://content.ces.ncsu.edu/septic-systems-and-their-maintenance, Figure 3.

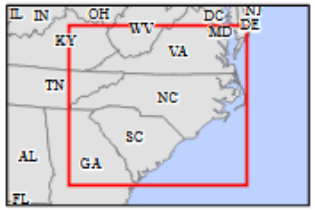
[1]Source -- https://vernonjames.ces.ncsu.edu/eleventh-annual-on-site/designing-large-septic-systems/
[2]Source -- https://www.eenorthcarolina.org/resources/educational-materials/your-ecological-address/groundwater

Florence Pummels North Carolina

- Tornadoes
- Flooding from rain and storm surges
- Food, water, and wastewater safety concerns.
- Environment and public health & safety immediate and longer-lasting impacts

FEMA-4393-DR, North Carolina Disaster Declaration as of 11/15/2018





Data Layer/Map Description:
The types of assistance that have been designated for selected areas in the State of North Carolina.

All designated areas in the State of North Carolina are eligible to apply for assistance under the Hazard Mitigation Grant Program.

Designated Counties

- No Designation
- Individual Assistance
- Public Assistance
- Individual Assistance and Public Assistance
- Individual Assistance and Public Assistance (Categories A - G)

N
W
E
S

0 25 50 75 100 Miles

Data Sources:
FEMA, ESRI;
Initial Declaration: 09/14/2018
Disaster Federal Registry Notice: Amendment #10, 11/15/2018
Datum: North American 1983
Projection: Lambert Conformal Conic

MapID 84c93f1cff50915182103hqprod

Emergency Situations

- During and in the aftermath of impactful events, it is paramount to identify, assess, categorize the potential threats.
- If an immediate threat to the health or safety of the public, the timing of responses and corrective actions is crucial.
- Want to minimize existing and continued threats.
- Other incidents may be more adequately addressed after power restoration and flood water recession.

Cooperative Efforts

Multiple agencies such as local health departments and State agencies perform crucial services during emergency conditions.

Local health department (LHD) personnel take actions during emergencies to mitigate, minimize and prevent hazards to ensure environmental compliance and protect the public.

Cooperative Efforts

- Minimize overlap or redundancy in the emergency response process
- Agencies coordinate with local personnel
- Act as both regulatory and boots-on-the-ground support
- Respond to public, industry and commercial concerns.

Planning, Planning, Planning

- Targeted planning for impending or potential natural disasters begins once initial impacts projections are determined.
- Planned actions are re-considered and revised as necessary to address any changes in projections or actual incidents as they occur.
- The North Carolina “Environmental Health Emergency Preparedness and Recovery Guidance Manual, revised 2018” (https://ehs.ncpublichealth.com/faf/food/fd/docs/EH-PreparednessManual-Final.pdf)

Identify, Assess and Categorize

One of the first actions to be taken during an emergency is to identify and assess situations and determine if there is an imminent health hazard.

Imminent Hazard

North Carolina General Statutes, NCGS § 130A-2, defines an imminent hazard as “a situation that is likely to cause an immediate threat to human life, an immediate threat of serious physical injury, an immediate threat of serious adverse health effects, or a serious risk of irreparable damage to the environment if no immediate action is taken.”

Emergency Action

- If a situation is categorized as an imminent hazard, the necessity to obtain a warrant for right of entry is waived in accordance with NCGS § 130A-17.
- This makes it easier for LHD and other regulatory entities to conduct inspections and assessments so that necessary actions can be taken to abate the imminent hazard, ensure environmental compliance, and thereby protect public health.

Example:

Addressing hurricane flooding impacts on septic system

Pre-flooding actions:

- Pro-actively attempt to identify all areas with systems that may be impacted, especially those that may be severely impacted.

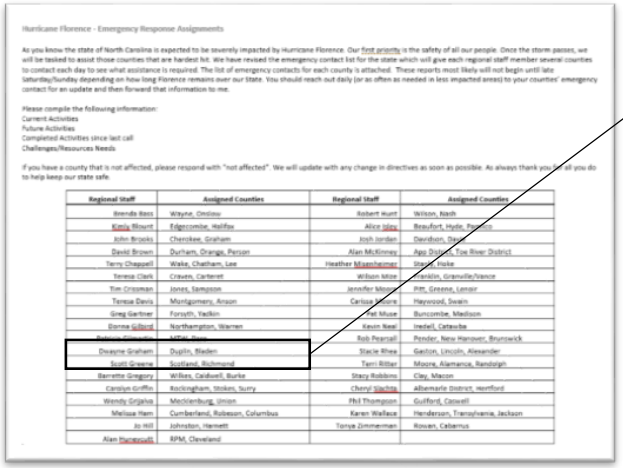
September 8, 2018

September 9, 2018

September 13, 2018

Pre-flooding actions:

- Assign personnel to monitor conditions, track pathways, and communicate with LHD personnel and other regulatory entities.
- Review compiled information to assess delegation of tasks and adjust as necessary to address changes in impact projections.



Hurricane Florence - Emergency Response Assignments

As you know the state of North Carolina is expected to be severely impacted by Hurricane Florence. Our first priority is the safety of all our people. Once the storm passes, we will be tasked to assist those counties that are hardest hit. We have revised the emergency contact list for the state which will give each regional staff member several counties to contact each day to see what assistance is required. The list of emergency contacts for each county is attached. These reports most likely will not begin until late Saturday/Sunday depending on how long Florence remains over our State. You should reach out daily (or as often as needed in less impacted areas) to your counties' emergency contact for an update and then forward that information to me.

Please compile the following information:
Current Activities
Future Activities
Completed Activities since last call
Challenges/Resources Needs

If you have a county that is not affected, please respond with "not affected". We will update with any change in directives as soon as possible. As always thank you for all you do to help keep our state safe.

Regional Staff	Assigned Counties	Regional Staff	Assigned Counties
Brenda Bass	Wayne, Onslow	Robert Hunt	Wilson, Nash
Kayla Blount	Edgecombe, Halifax	Alice Isley	Beaufort, Hyde, Pamlico
John Brooks	Cherokee, Graham	Josh Jordan	Davidson, Davie
David Brown	Durham, Orange, Person	Alan McKinney	App District, Toe River District
Terry Chappell	Wake, Chatham, Lee	Heather Miaschewer	Stanly, Hoke
Teresa Clark	Craven, Carteret	Wilson Moss	Franklin, Granville/Vance
Tim Crissman	Jones, Sampson	Jennifer Moss	Pitt, Greene, Lenoir
Teresa Davis	Montgomery, Anson	Carissa Moore	Haywood, Swain
Greg Gartner	Forsyth, Yadkin	Pat Muse	Buncombe, Madison
Donna Gilford	Northampton, Warren	Kevin Noel	Iredell, Catawba
Dwayne Graham	Duplin, Bladen	Rob Pearsall	Pender, New Hanover, Brunswick
Scott Greene	Scotland, Richmond	Stacie Rhea	Gaston, Lincoln, Alexander
Barrette Gregory	Wilkes, Caldwell, Burke	Terri Ritter	Moore, Alamance, Randolph
Carolyn Griffin	Rockingham, Stokes, Surry	Stacy Robbins	Clay, Macon
Wendy Grijalva	Mecklenburg, Union	Cheryl Stachla	Albemarle District, Hertford
Melissa Ham	Cumberland, Robeson, Columbus	Phil Thompson	Guilford, Caswell
Jo Hill	Johnston, Harnett	Karen Wallace	Henderson, Transylvania, Jackson
Alan Hunsucker	RPM, Cleveland	Tonya Zimmerman	Rowan, Cabarrus

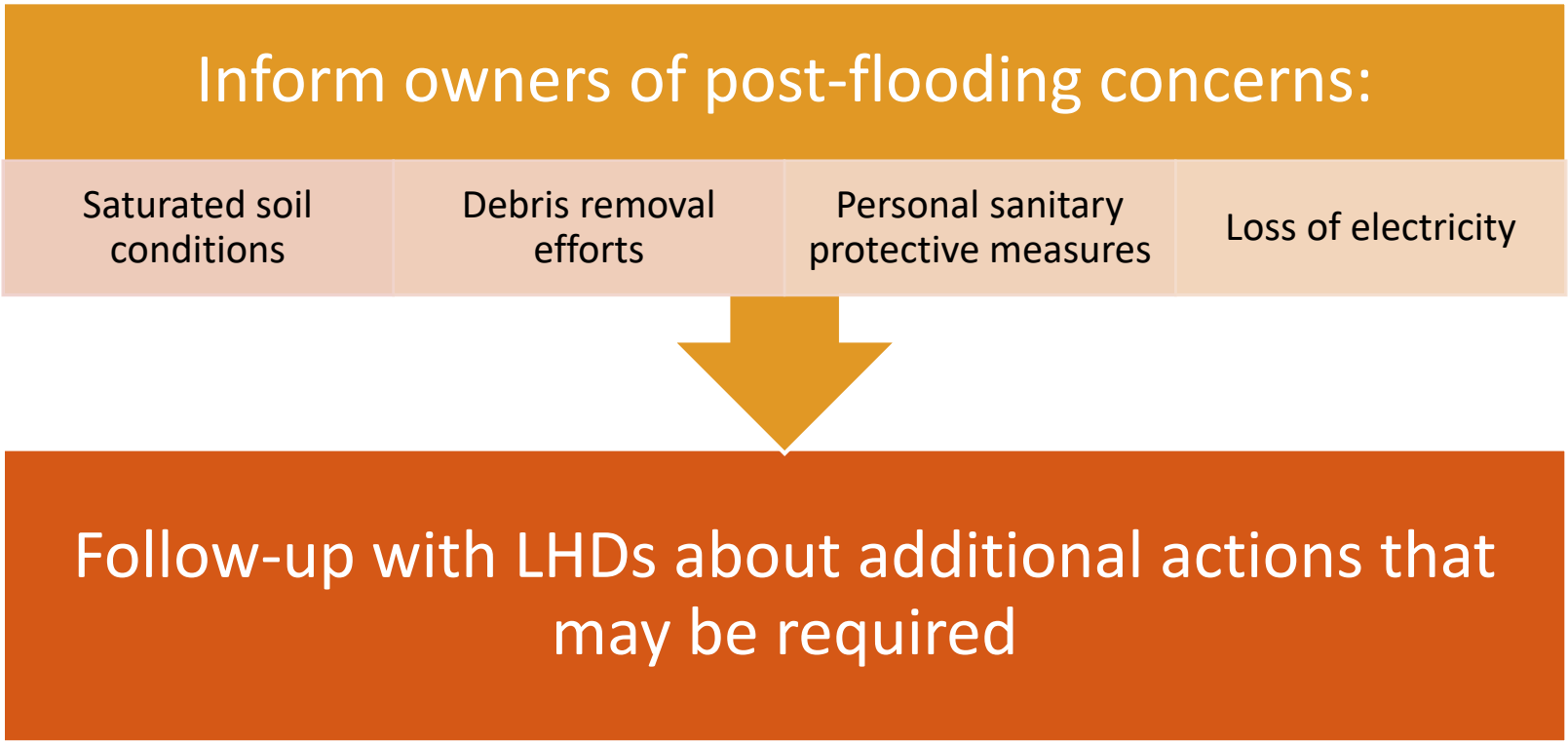
Dwayne Graham	Duplin, Bladen
Scott Greene	Scotland, Richmond

Post-flooding actions:

- Until flood waters have receded and soil conditions have returned to normal, it is difficult to determine if a system will be non-compliant.
- Communicate with LHD personnel and other regulatory entities to determine if there are septic systems impacted that require immediate on-site action (e.g., collapsed WWTP basin wall, floating tanks, exposed dispersal piping)

ı, South Nags Head, North Carolina. Photo Gallery Courtesy of: © Orrin H. Pilkey, and Norma Longo, Duke University
elly, University of Maine

Post-flooding actions:




thank you
danke
謝謝
ngiyabonga
teşekkür ederim
gracias
merci
obrigado
dziękuję
bedankt
go raibh maith agat
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terima kasih
grazie
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Questions

Lorna Withrow, PE

NCDHHS, DPH, OSWP

https://ehs.ncpublichealth.com/oswp/

919.707.5879

Lorna.Withrow@dhhs.nc.gov