Air Quality Emerging Contaminants Update

March 2018

Division of Air Quality

Department of Environmental Quality

Are GenX and Other Chemicals in the Air Near Chemours?

GENX IN FOOD? HIGH LEVELS OF CONTAMINATION FOUND IN FARMER'S HONEY

Toxin taints CFPUA drinking water

By Vaughn Hagerty StarNews Correspondent
Posted Jun 7, 2017 at 10:31 AM
Updated Jun 8, 2017 at 10:38 AM

Utility can't filter out chemical produced upriver at Fayetteville plant

WILMINGTON -- A chemical replacement for a key ingredient in Teflon linked to cancer and a host of other ailments has been found in the drinking water system of the Cape Fear Public Utility Authority (CFPUA), which cannot filter it.

North Carolina Science Advisory Board meets with DEQ about GenX

GenX is a big story, and getting bigger

GenX Response: Activist Groups Unite Forces

08/30/2017 by Allison Ballard

Email Print

Chemours told to cut fluorocarbon air pollution from North Carolina plant

Tainted rain, contaminated drinking water linked to air emissions, state says

By Cheryl Hogue

Experts: Toxic GenX may never disappear from the Cape Fear

What do we mean when we say Emerging Contaminants?

- **No specific limit in environmental regulations.**
- **Sparse knowledge about how they behave in the environment.**
- **Little known about their effects on human health and environment.**

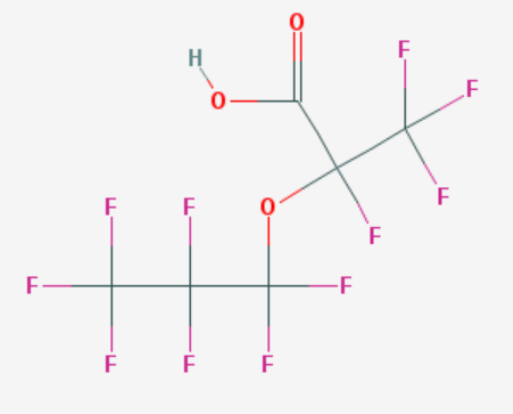
- **Significant challenge for regulatory agencies.**
- **How to prioritize? Research? Minimize impacts? Communicate?**

Emerging Contaminants in NC

What happened? How did it become an issue?

- **EPA monitoring, 2013-2015 via the Third Unregulated Contaminant Monitoring Rule (UCMR)**
  - **28 chemicals including PFOA, PFOS and 1,4-Dioxane.**
- **EPA and NCSU, 2014-2016, study PFOA, PFOS and other per- and poly-fluorinated chemicals in the Cape Fear River.**
- **DEQ 2014-2016 study on 1,4-Dioxane, focusing on the Cape Fear River after results indicated higher concentrations than other river basins.**
- **EPA National Exposure Research Laboratory (NERL) published a report in 2015.**
- **Research findings published in Nov. 2016 on PFOA/PFOS, GenX and other related chemicals attributed to the Chemours (formerly DuPont) facility just south of Fayetteville, NC.**
- **Techniques and lab capabilities advanced.**

Emerging Contaminants
GenX ? What's that?



What is GenX?

- **C3 Dimer Acid, $C_6HF_{11}O_3$**
- **GenX is a trade name for a man-made and unregulated chemical used in manufacturing nonstick coatings and for other purposes.**

- **Chemours' facility (formerly DuPont) near Fayetteville began <u>producing</u> GenX commercially in 2009 as a replacement for Perfluorooctanoic acid (PFOA).**

- **The same chemical is also produced as a <u>byproduct</u> during other manufacturing processes at Chemours and it may have been present in the environment for many years before being produced commercially as GenX.**

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Emerging Contaminants
GenX… Is it bad for you?

Unregulated compounds: What do you do?

- **National regulatory standards (EPA)**
- **State Standards (DEQ/Environmental Management Commission)**
- **National health advisories or other health values (EPA, CDC)**
- **Other governmental guidance (other states or countries)**
- **If all of the above are not available… can consider establishing a state-specific health goal**

- **NC DHHS health goal established for GenX = 140 ppt**
  - **For <u>drinking water</u>**

Emerging Contaminants

History of the source

- **DuPont began chemical manufacturing at the plant along the border of Cumberland and Bladen Counties in 1971.**
- **Around 1980, DuPont began manufacturing products using fluorinated compounds.**
- **GenX manufacturing began after a 2009 Consent Agreement under TSCA was signed by EPA and the company. GenX has been a byproduct of the vinyl ether production line.**
- **DuPont transitions site ownership to Chemours.**

Emerging Contaminants

Evolution of an issue

- **Early-mid 2017:** **focus on surface water issues**
- **Mid 2017:** **groundwater issues discovered**
- **Mid-late 2017:** **air emission contributions**

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Air Quality
ENVIRONMENTAL QUALITY

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

MICHAEL A. ABRACZINSKAS
Director

September 20, 2017

Mr. Ellis H. McGaughy
Plant Manager
Chemours Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28306-7332

SUBJECT: Air Contaminant Emissions Request
Air Quality Permit No. 03735T43
Chemours Company Fayetteville Works
Facility ID: 0900009, Fayetteville, Bladen County
Facility Classification: Title V

Dear Mr. McGaughy:

As our Department works to understand the full extent of the potential environmental impacts of GenX and other emerging contaminants produced and/or used at the Chemours (and previously DuPont) Fayetteville Works facility, the Division of Air Quality (DAQ) is requesting information as to whether GenX and other emerging contaminants are currently, or have been, emitted as an air contaminant. While prior air emissions documentation submitted by Chemours for the year 2016 contains GenX air emissions data, we are requesting additional information related to GenX and other emerging contaminants for the years 2012 through the present. This information is being requested under authority in NCGS 143-215.107(a)(4).

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Chemours reported air emissions (pounds per year)

	2012	2013	2014	2015	2016
C3 dimer acid fluoride	500	539	545	669	591
C3 dimer acid (GenX)	1	3	4	3	3
C3 dimer acid ammonium salt	1	3	3	2	2

- **All data based on chemical process computational model.**

What's the role of air emissions?

- Wind data
- Air dispersion modeling

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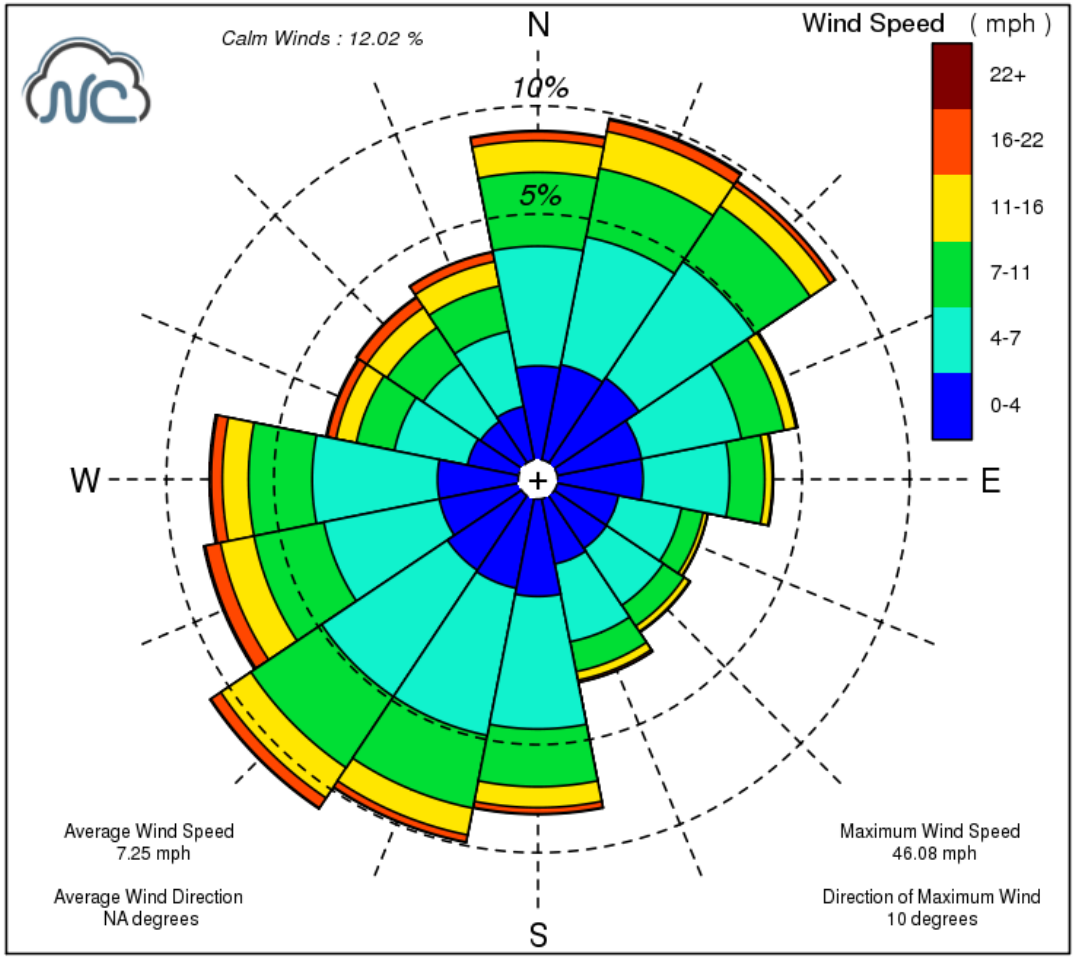
Wind Rose for Fayetteville Airport (KFAY)
Jan. 10, 1998 to Sep. 29, 2017



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Air Dispersion Modeling

- Chemours actual air emissions for 2012-2016
  - GenX compounds only
- Actual stack characteristics
- Actual hourly meteorology over the 5-year period

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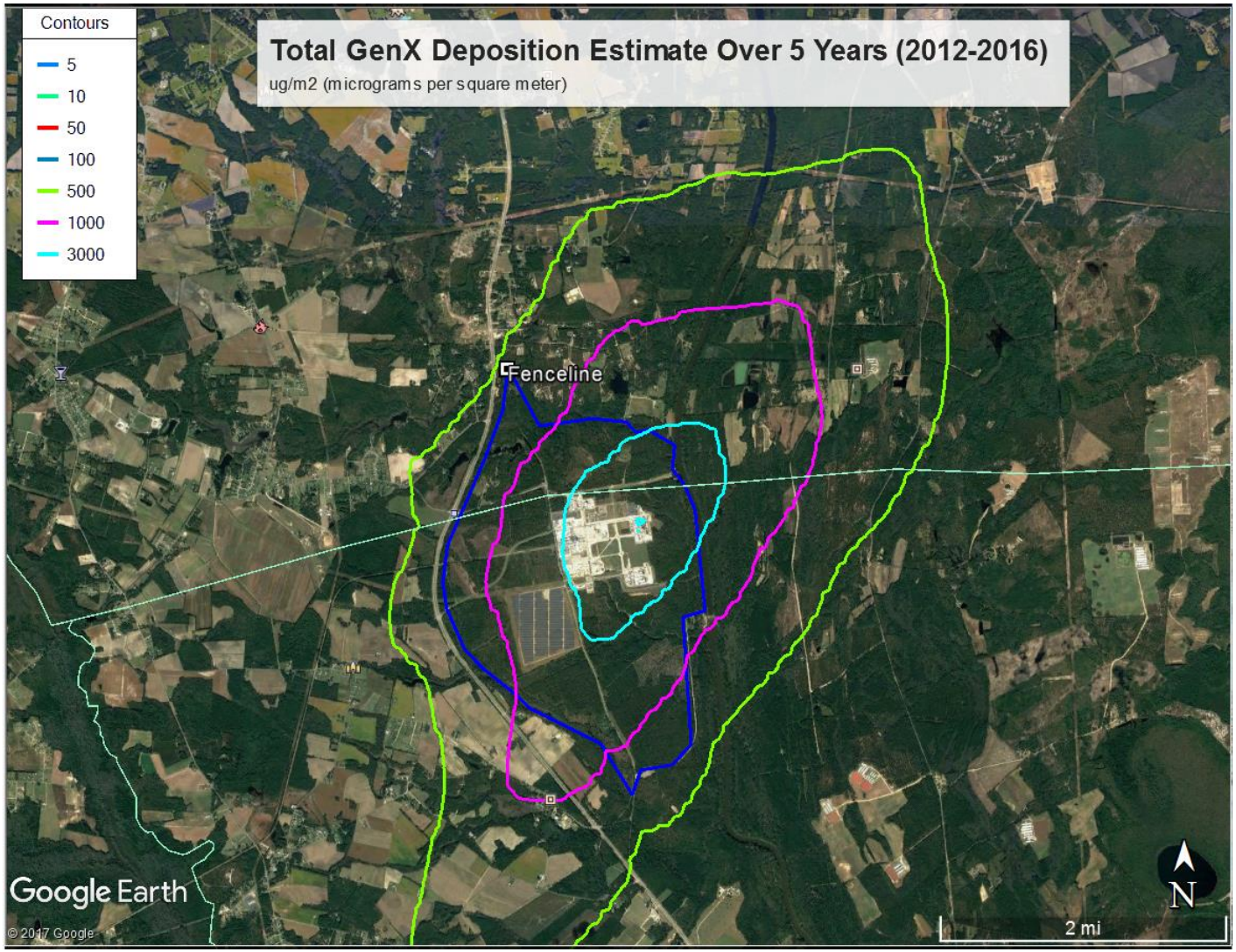

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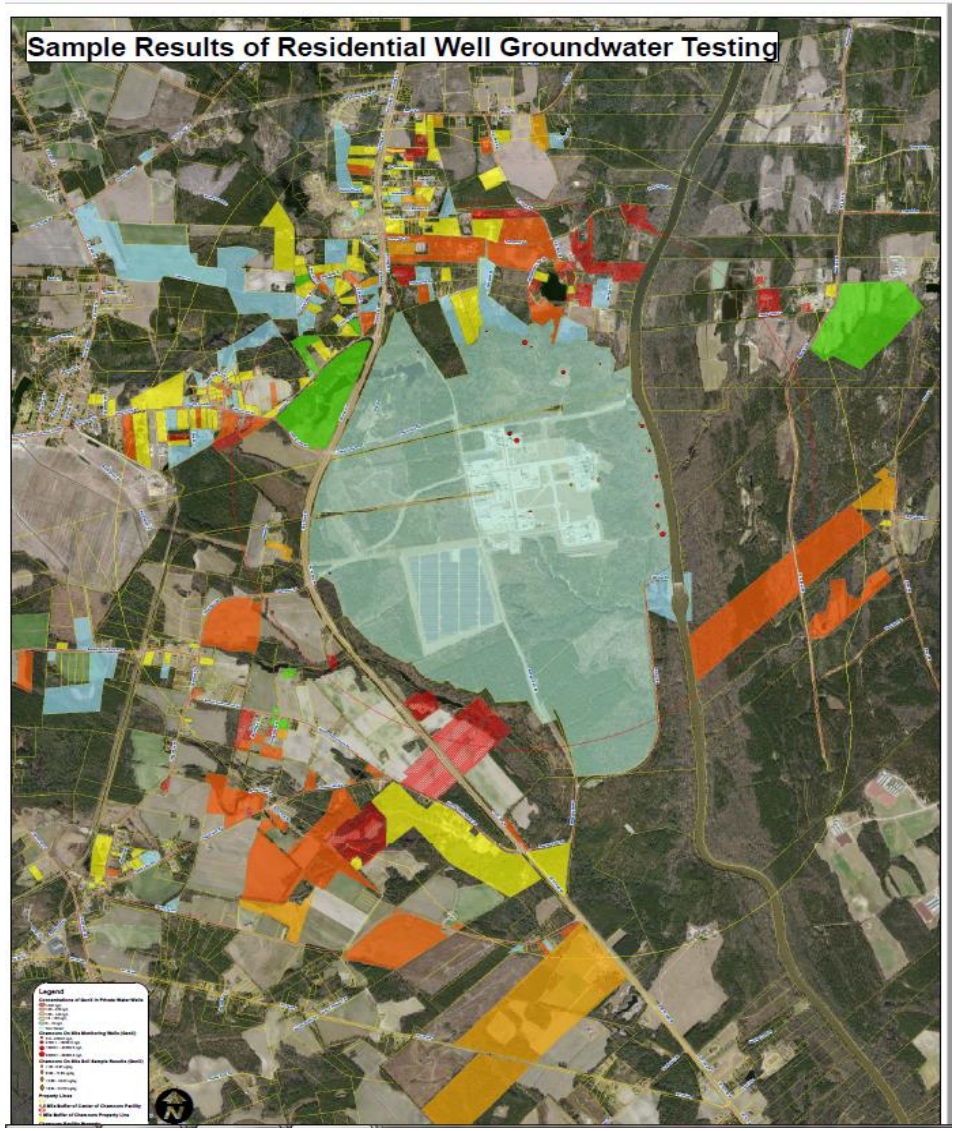

Well Sampling Results near Chemours: Phases 1-3 (up to ~1.5 mi. from facility border)

GenX: NC health goal = 140 ppt

Red = > 420 ppt
Dark Orange = 140 - 420 ppt
Orange = 100 - 140 ppt
Yellow = 10 –100 ppt
Green = 0 - 10 ppt, detected
Blue = ND (Non Detect result)

No color = not tested

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Air Emissions Testing or “Stack Testing”

- Capture and quantification of specific pollutants being emitted to the atmosphere from a process through the stack.
- Chemours has submitted a protocol to define which sources they will test, which test method they will use and which contaminant they will target for quantification.

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Air Emissions Testing or "Stack Testing"

- Target contaminant – C_3 Dimer Acid (GenX)

- Sources to be tested:
  - Fluoromonomers, Nafion, and Polymer Processing Aid (PPA) processes
  - Test Locations - Division, VE South Scrubber and PPA stacks

- Shake-down testing – January 9 & 12
- Full scale testing – week of January 22
  - Split samples for independent assessment by EPA lab
- Results expected early March
- Additional testing – week of February 26 & beyond

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Need for information… now!

- Purchased temporary rain collection equipment.
- Used lab protocols to prepare equipment.
- Gained authority to ship rain samples to qualified lab for analysis.
- Split the samples… sent to EPA for full PFAS analysis.

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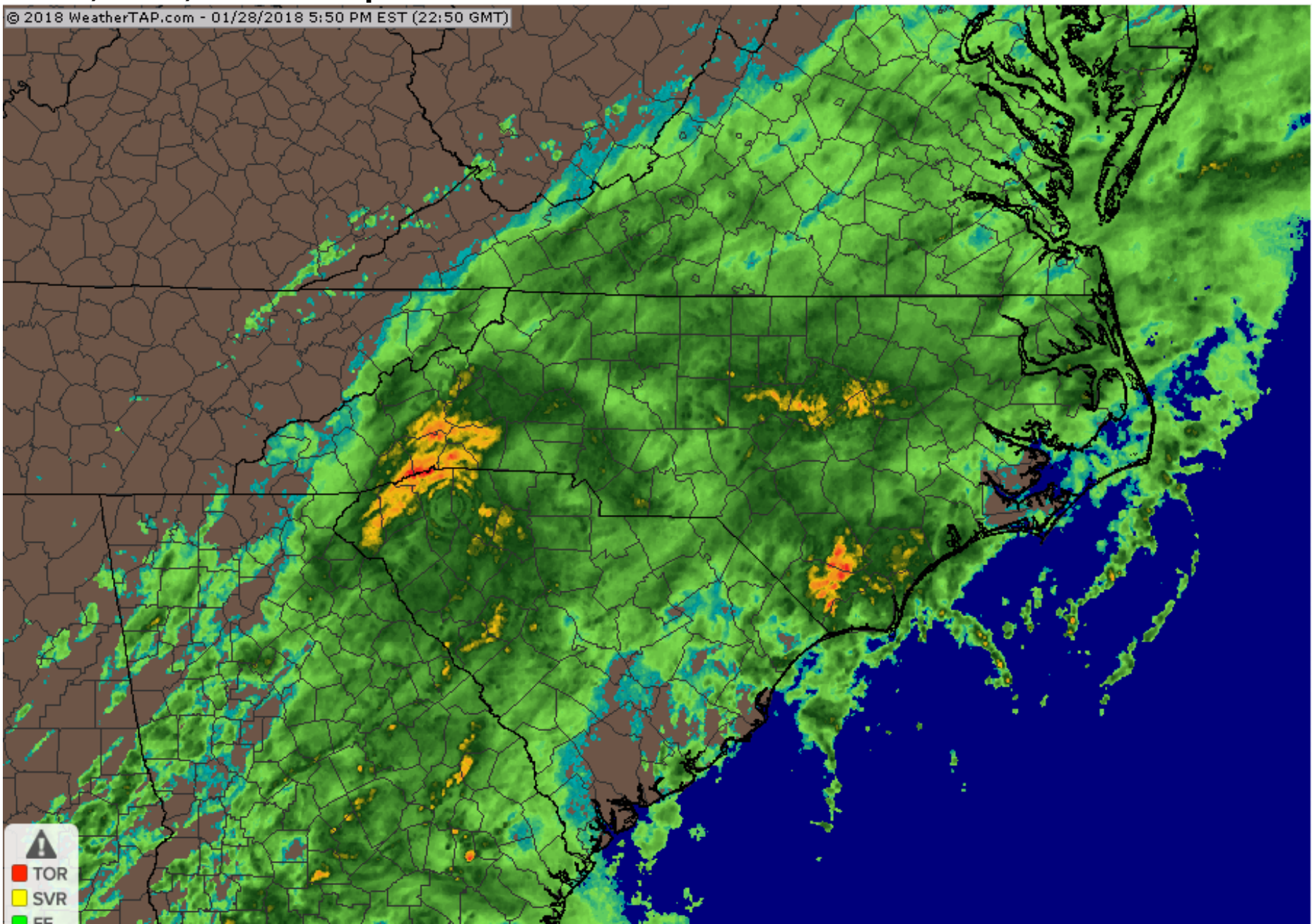
Jan 28, 2018, radar 5:50pm



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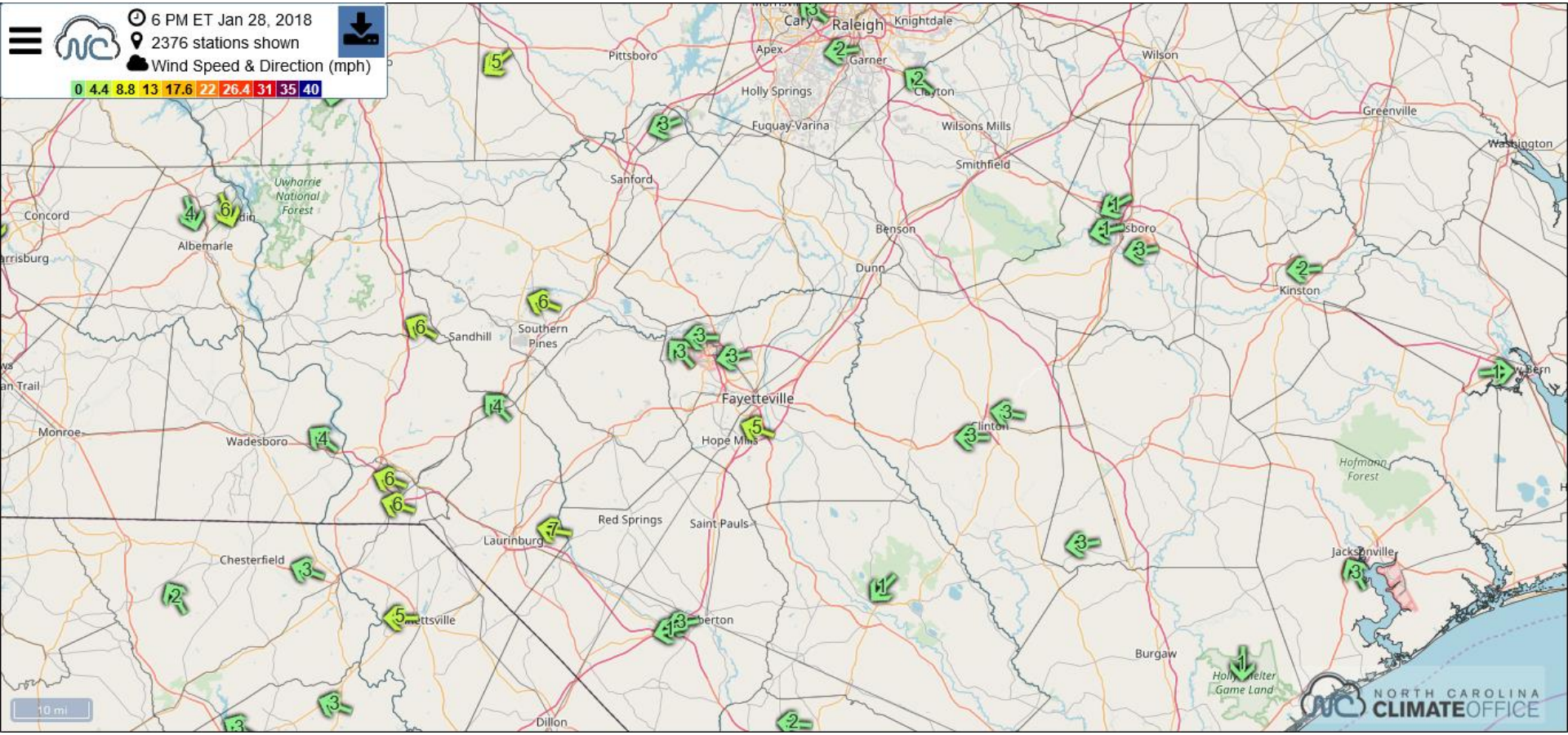

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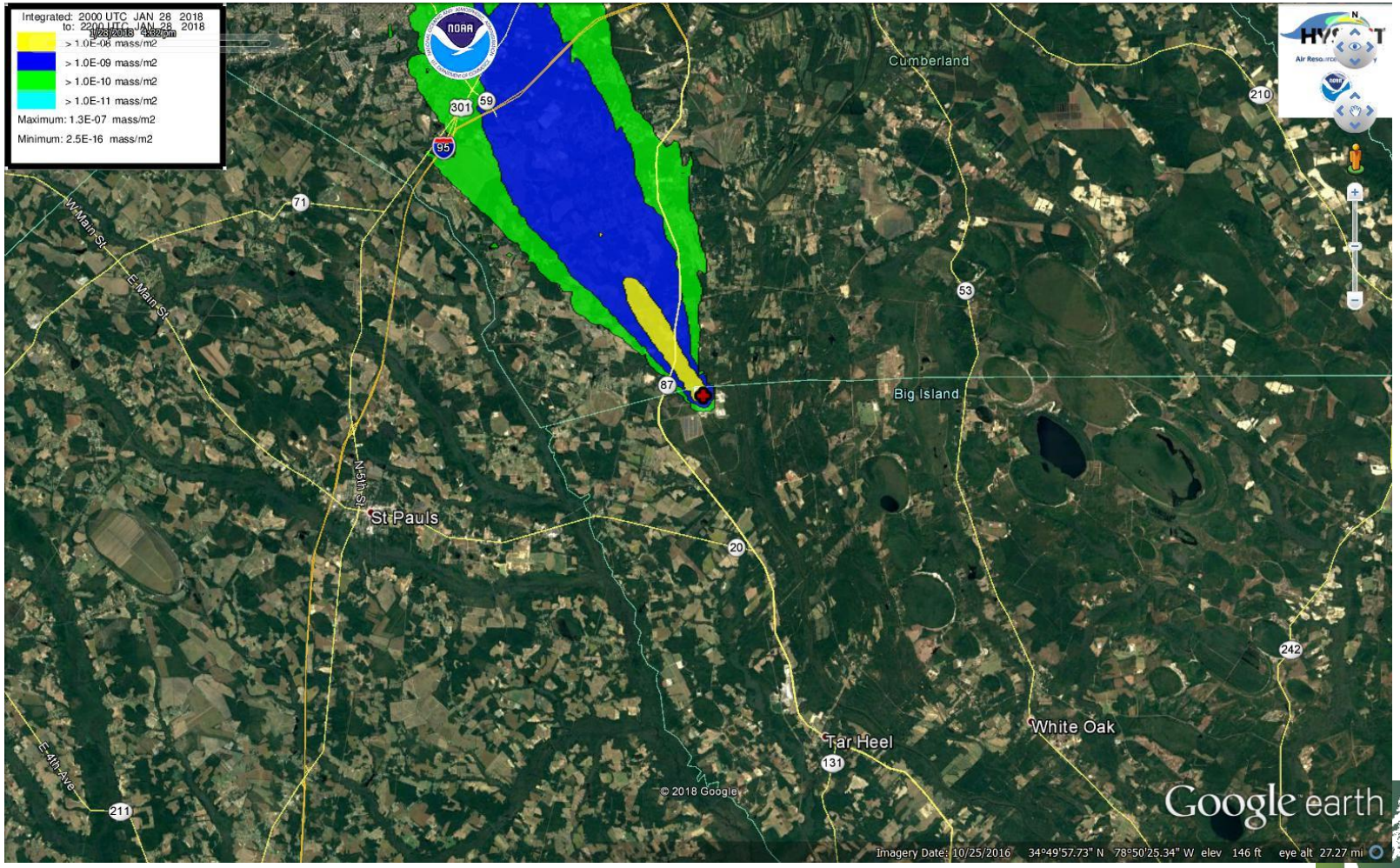
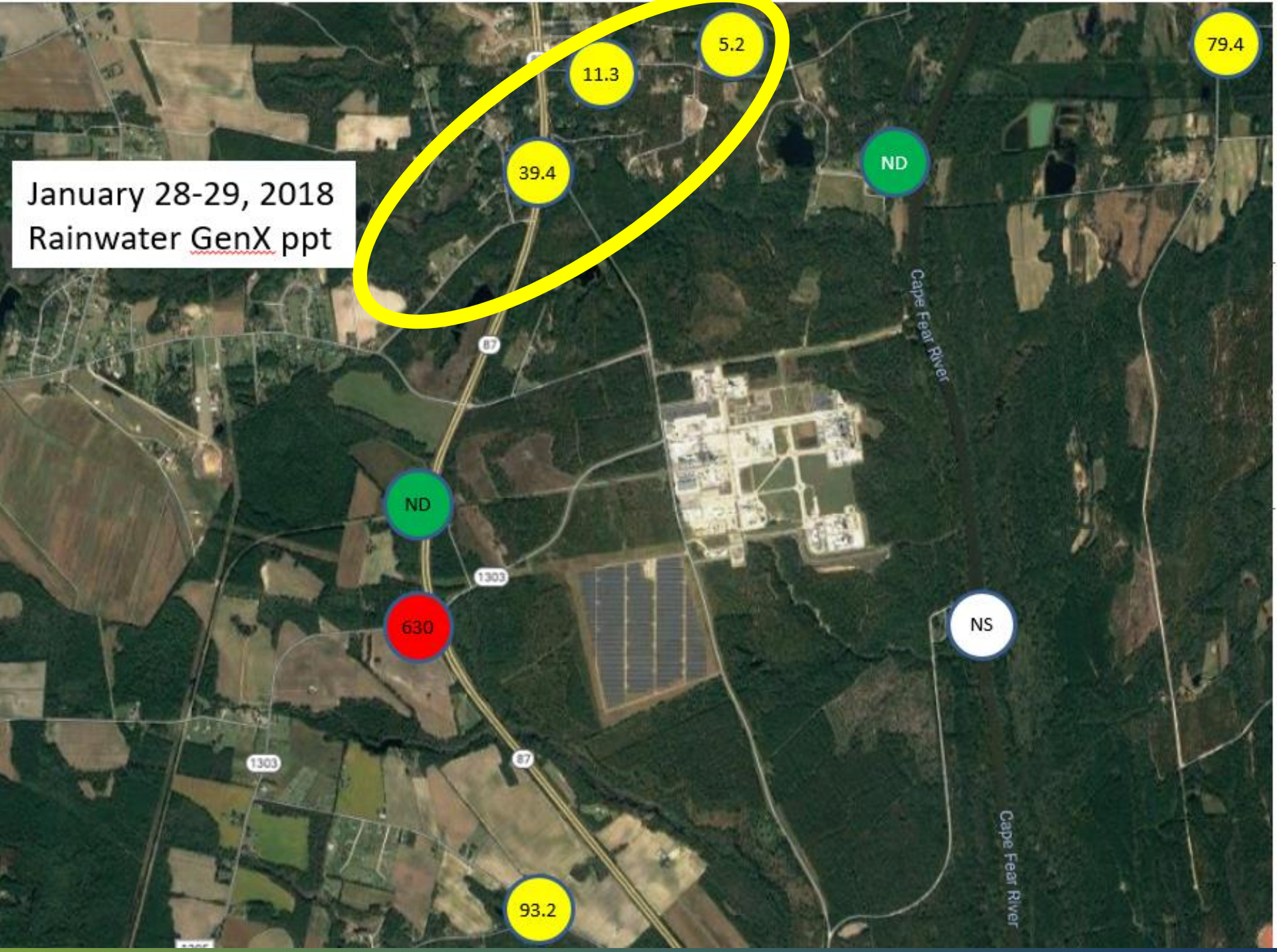
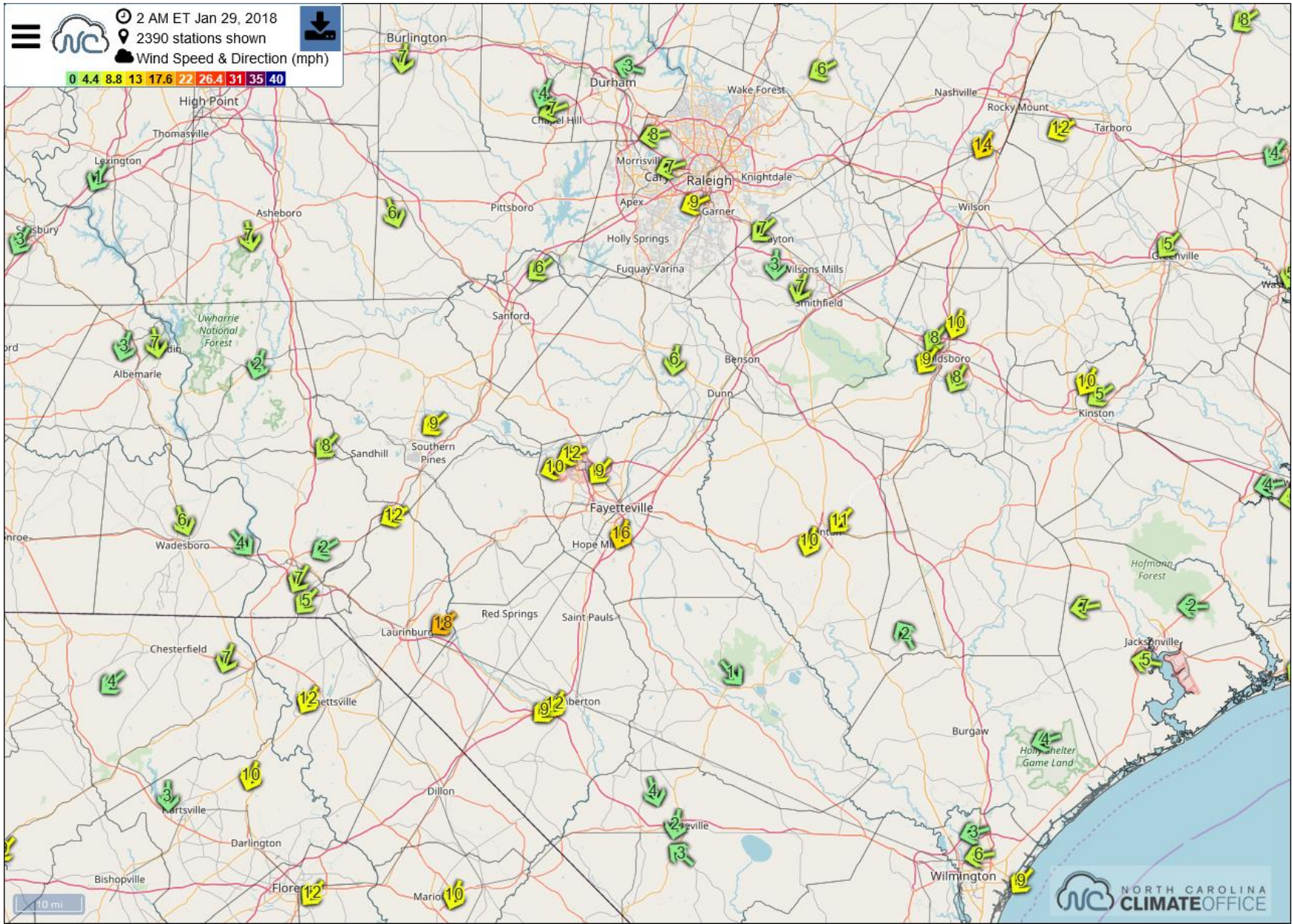



January 28-29, 2018
Rainwater GenX ppt
5.2
11.3
39.4
79.4
ND
ND
630
NS
93.2
87
1303
1303
87
Cape Fear River
Cape Fear River

Jan 29, 2018, 2am



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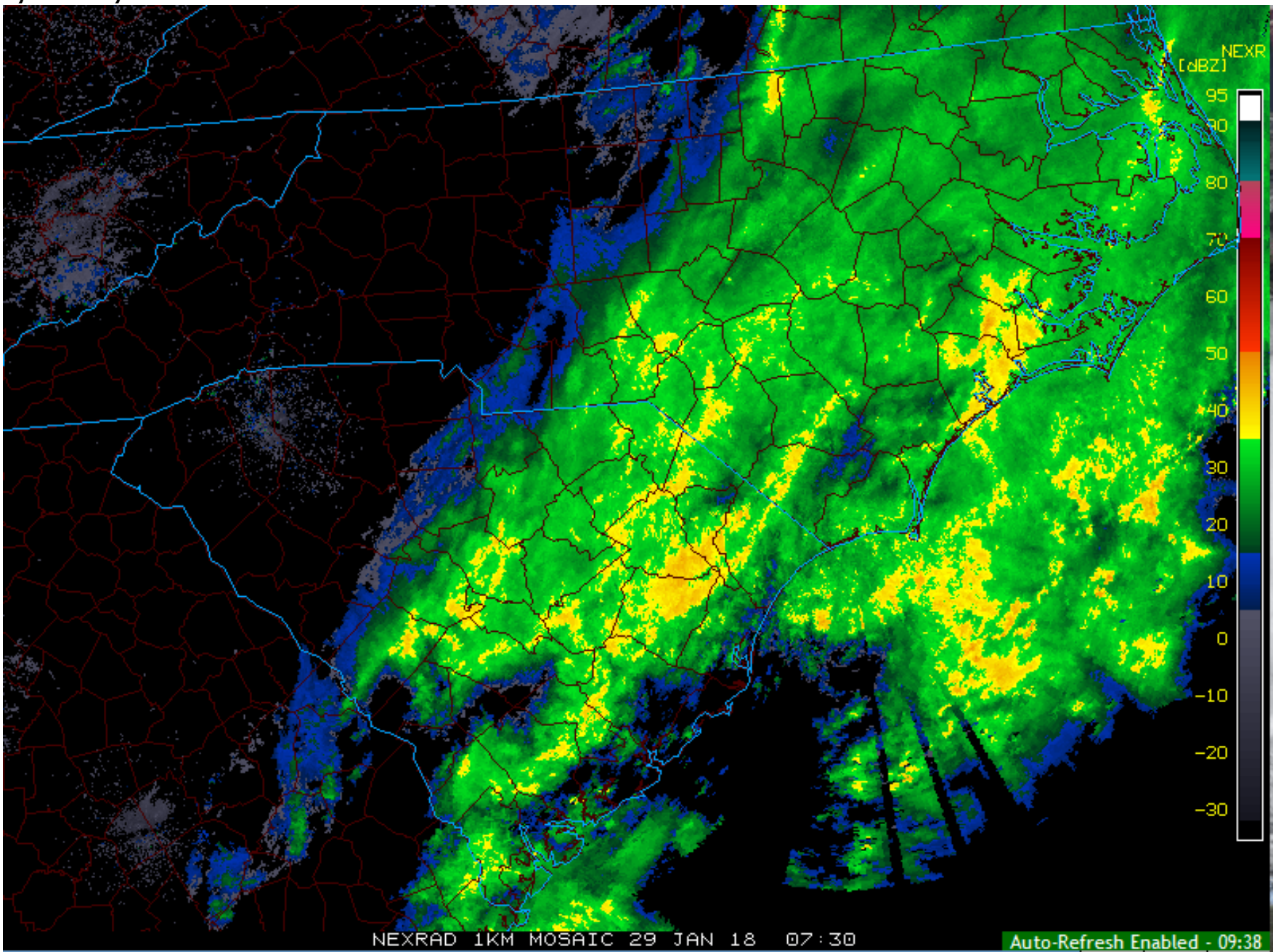

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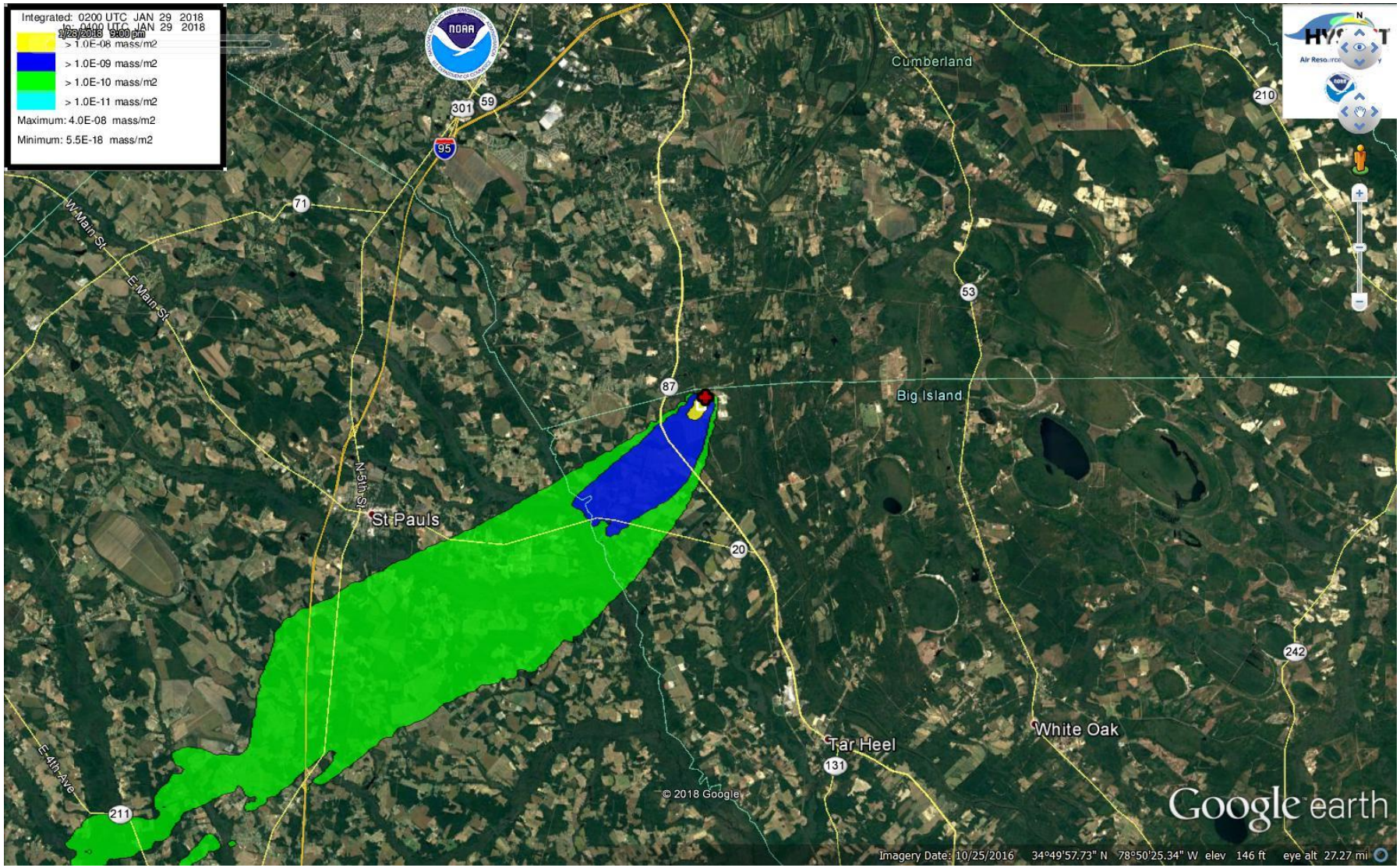

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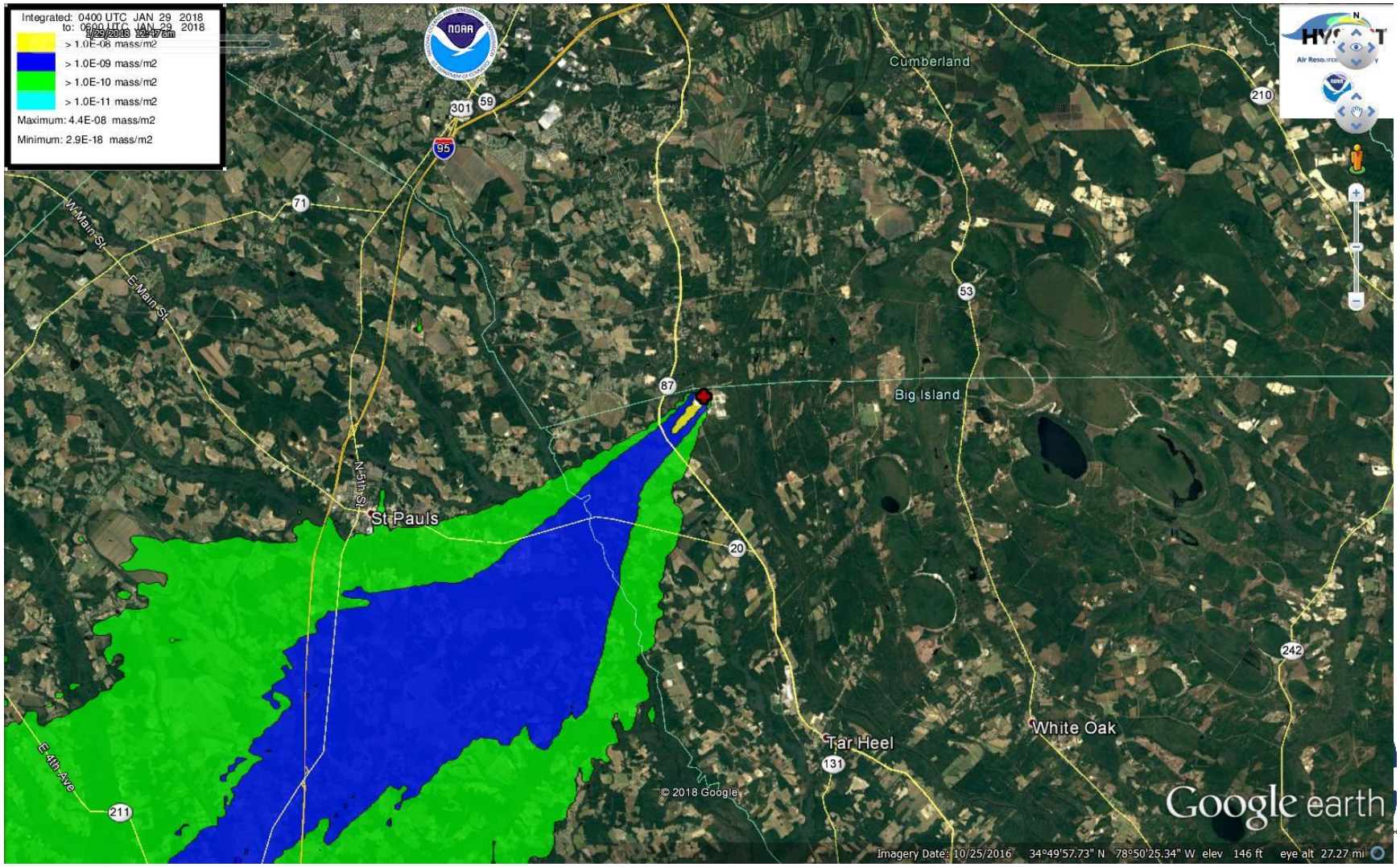

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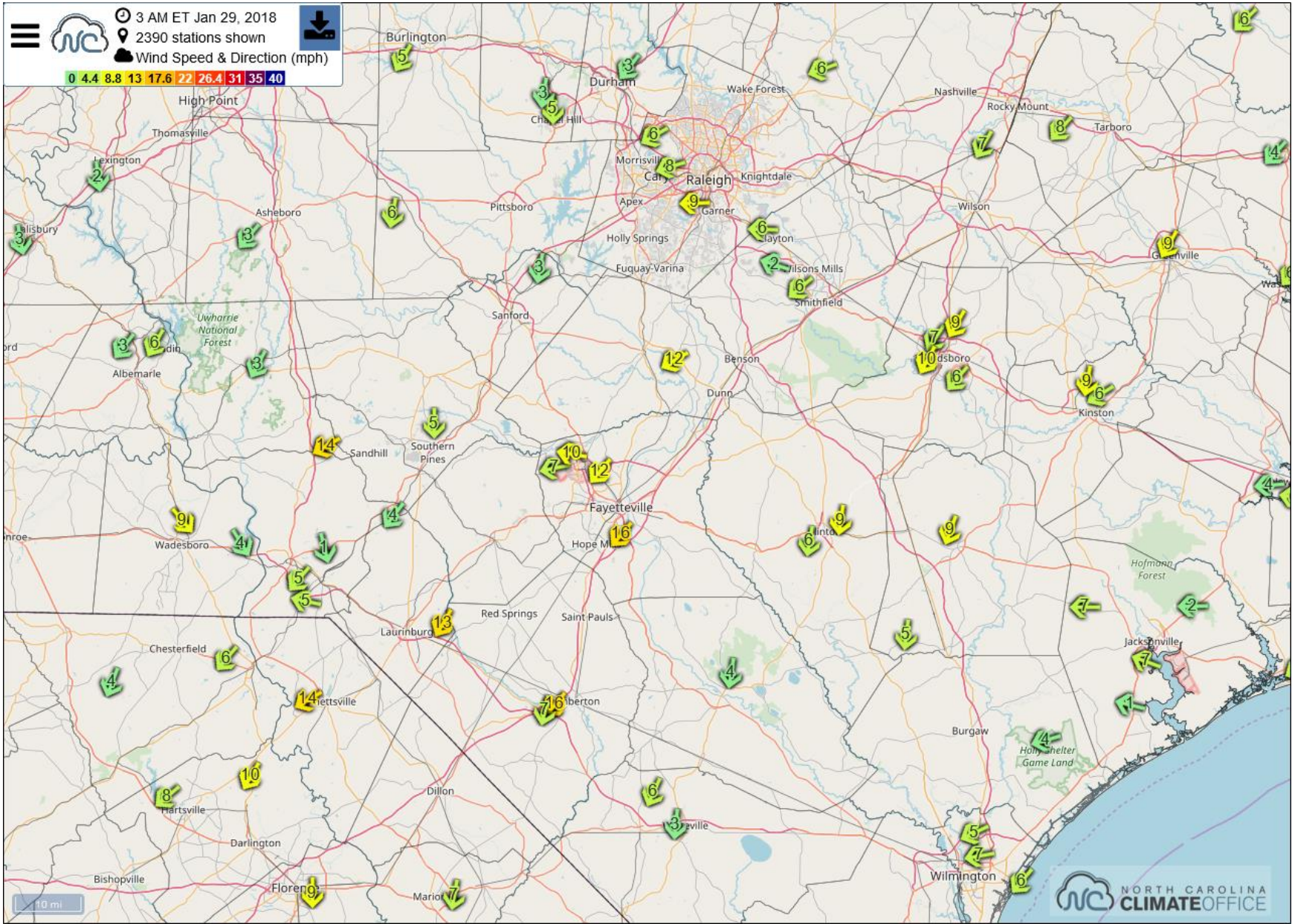

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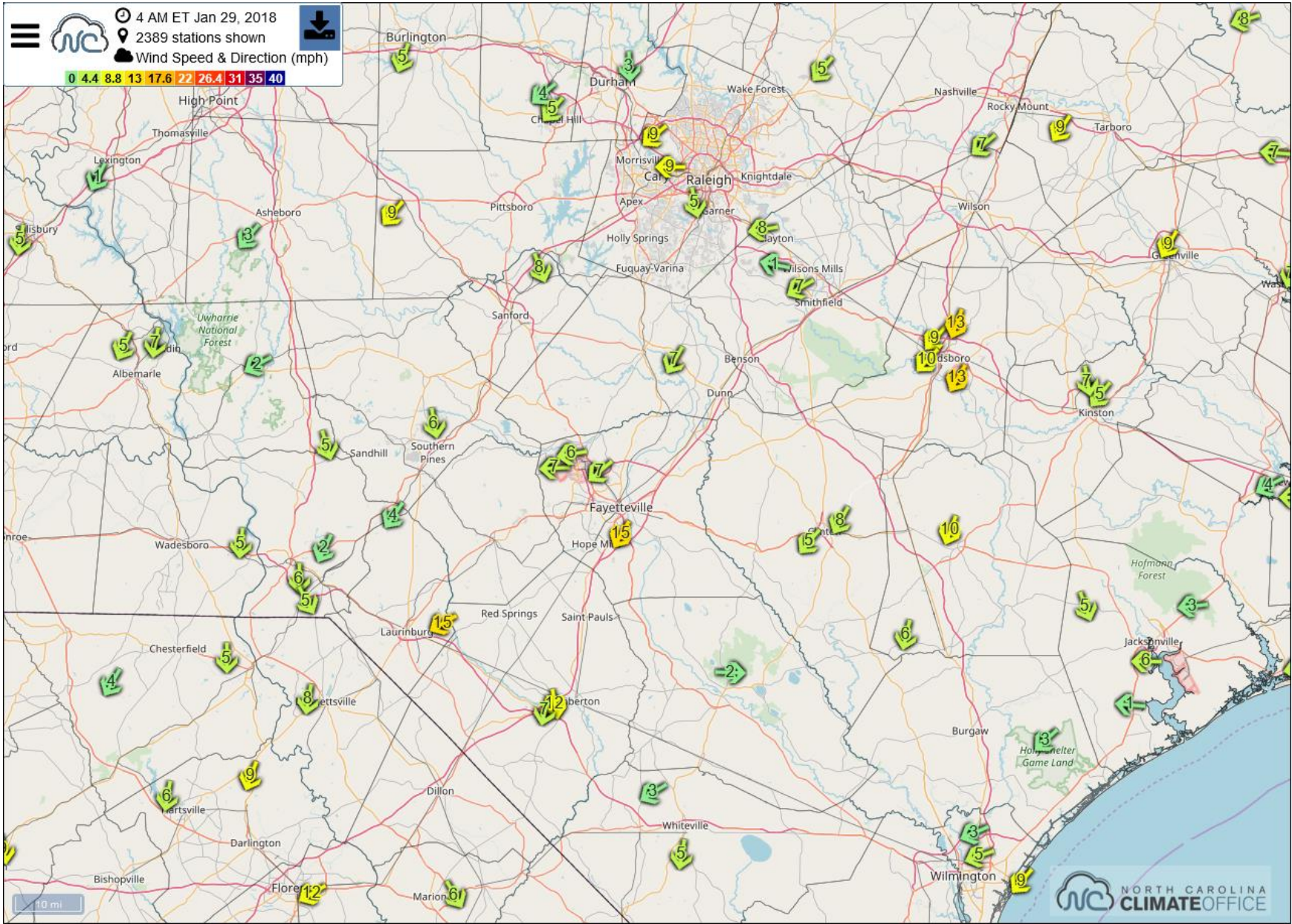

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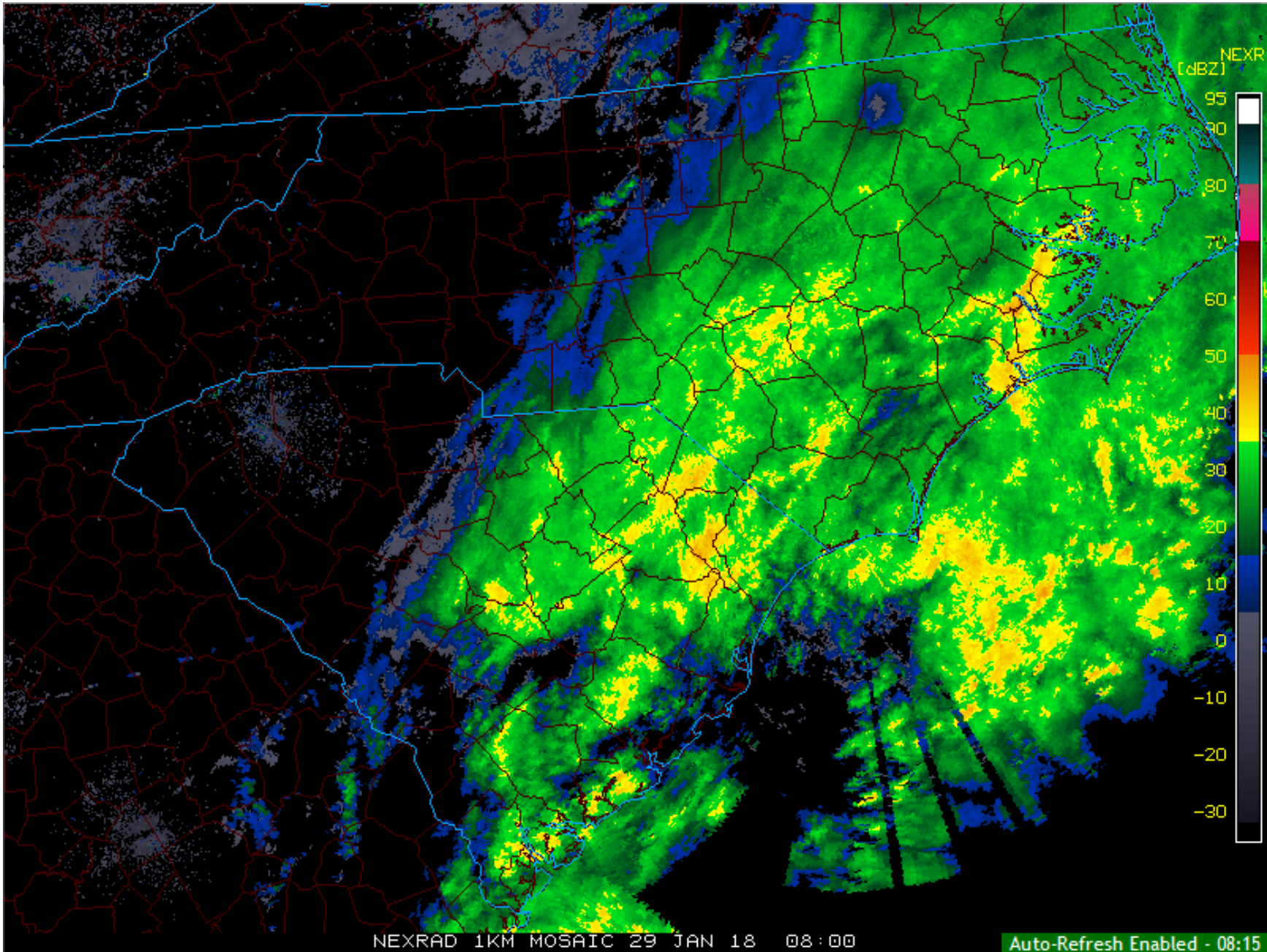

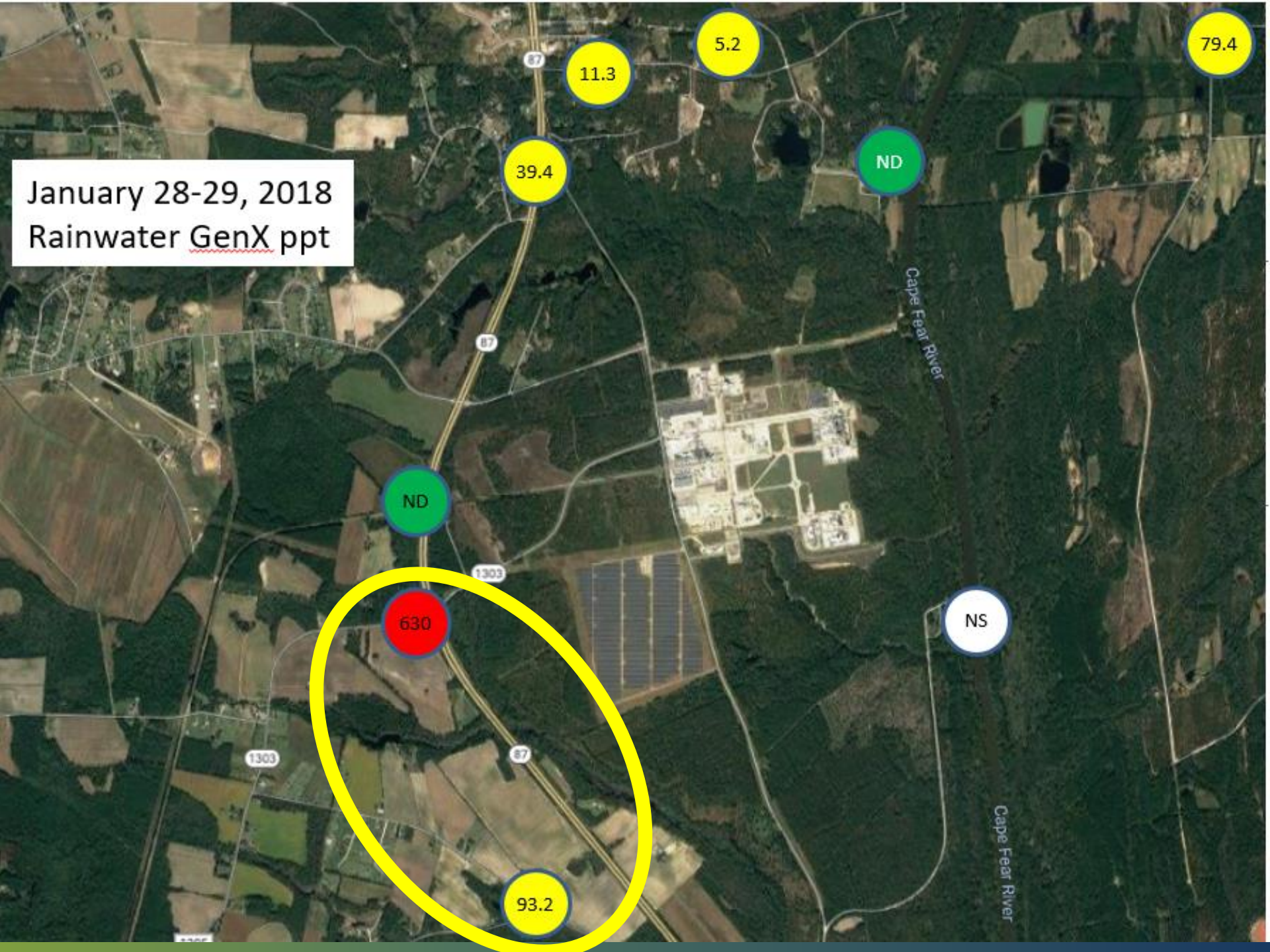
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87
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Cape Fear River
Cape Fear River

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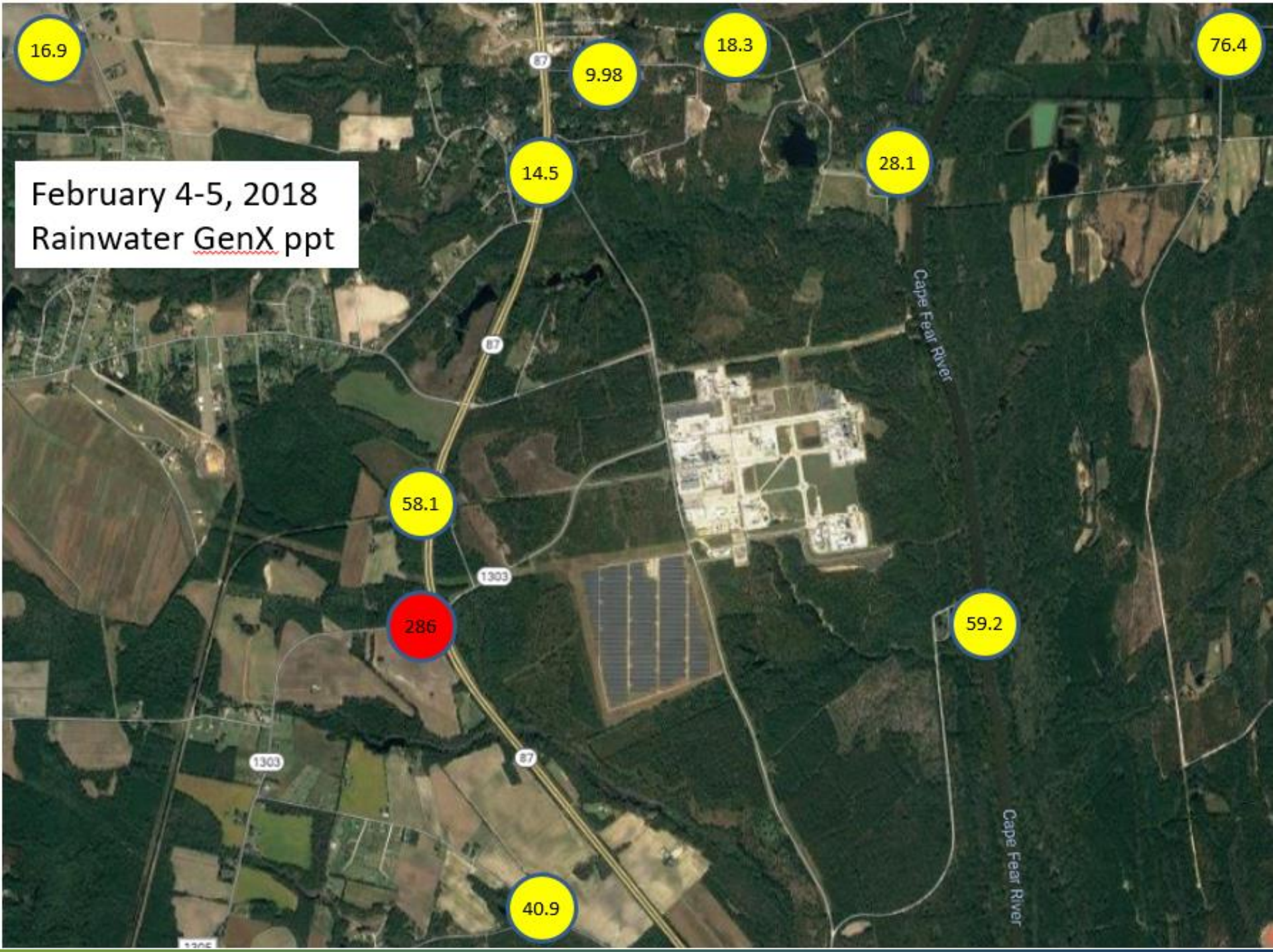
Additional rainwater analysis

February 4-5, 2018


February 4-5, 2018
Rainwater GenX ppt
16.9
9.98
18.3
76.4
14.5
28.1
58.1
286
59.2
40.9
87
1303
Cape Fear River
Cape Fear River

Composite analysis Jan 28 and Feb 4 rain events

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Ambient Air Quality Monitoring

- Network of wet deposition monitors planned.
- Goal: Quantify near-field deposition rates and confirm cause/effect relationships. Quantify "background" amounts of PFAS in rainwater.
  - Source-oriented sites near Chemours
    - 2 northeast of facility
    - 2 southwest of facility
  - Background sites
    - Asheville
    - Raleigh
    - Candor
    - Wilmington

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Ambient Air Quality Monitoring

- Gather available samples from the National Atmospheric Deposition Program (NADP) in NC and send to EPA lab for analysis of PFAS.
  - Clinton Crops site in Sampson County
  - Jordan Creek in Scotland County

- EPA has agreed to do the lab analysis.

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- **Resources devoted to emerging compounds have increased as the Chemours situation has unfolded.**

Director
Deputy Director

Fayetteville Regional Office
Journey Engineer
Environmental Senior Specialist

Compliance
Section Chief
Journey Engineer
Journey Engineer
Contributing Engineer
Contributing Engineer

Permitting
Section Chief
Engineering Supervisor
Journey Engineer
AQ Analysis Supervisor
Meteorologist II

Ambient Monitoring
Section Chief
Lab Supervisor
Environmental Technician
Chemistry Technician III
Chemistry Technician II
Electronics Technician III
Chemist III

Planning
Meteorologist II
Meteorologist II
Meteorologist I

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What control techniques will eliminate or significantly reduce the air emissions of interest?

- **Exploring all options.**
- **Studying technologies, gathering available test data.**

- **Understanding secondary impacts of adding air pollution controls to reduce PFAS.**
    - **Solid waste generated?**
    - **Waste water generated?**
    - **Secondary air pollutants generated**
- **Approved trial carbon adsorption technology for 2 processes on February 9, 2018**
    - **Portion of emissions profile.**

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What's next at Chemours?

- Control technologies. Move quickly.
  - How can we eliminate or significantly reduce the compounds of concern?
- Ambient monitoring
  - Get permanent equipment in the field.
  - Funding?
- Method development
  - EPA
- Learning from others
  - States and Countries
- Atmospheric fate?
  - Need help. Asking EPA and Universities.

What's next?

- Looking beyond GenX… what are the possible needs?
  - Do we have the lab and field equipment that we need?
  - Do we have emissions inventory information that shows emissions of other PFAS? There are thousands of species of volatile organic compounds. How to prioritize? Which ones pose the greatest potential health risks?

Contacts

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