



Storm Prep & Grid Resiliency

June 29, 2023



Why the need for meteorologists?

- Weather is the primary driver of **electricity demand**
 - Hotter temps in summer → ↑ A/C demand
 - Colder temps in winter → ↑ heating demand
 - 1° temperature error can add up quickly!
- Weather can affect **electricity supply**
 - Rainfall forecasting (hydro generation)
 - Wind/solar forecasting
- Weather affects **electricity reliability**
 - Adverse weather causes power outages
 - Storm forecasting and impact modelling
- **Climate change** affects the utility model
 - Provide subject matter expertise to drive policy



What type of support does Duke Meteorology provide during major storm events?

- 24x7 support of transmission, distribution and customer support groups before, during and after the event
- Frequent storm forecast updates – track, intensity, timing, duration.
- **Pre-storm prediction** models that forecast **outages** (i.e., outage events and total customer outages), **outage event type** (e.g., feeder, fuse, recloser, transformer) and **resource needs** (e.g., line, DA, veg) at the distribution level for every Op Center zone in the Service Area.
- The closer the storm gets to landfall, the more accurate the forecast becomes, which helps improve the prediction of damage to our system and the plans for restoration.
- Storm surge forecasts
- Site-specific wind intensity and duration forecasts/graphics



2023 Duke Internal Tropical Forecast



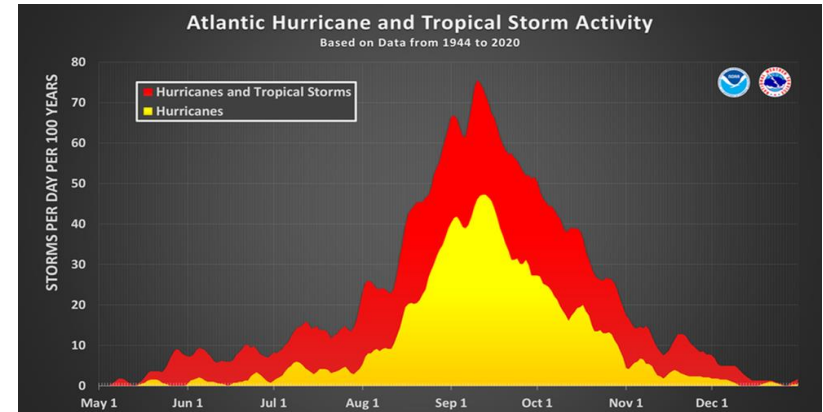
	2023 April Forecast	2022 Season Actuals	2022 Spring Forecast	Average (1993-2022)
Named Storms	17	14	19	15.1
Hurricanes	10	8	9	7.4
Major Hurricanes*	3	2	4	3.3
				*ACE - 125 *Gulf - 3

Tropical Cyclone Names 2023

Atlantic Basin

Arlene	Gert	Margot	Tammy
Bret	Harold	Nigel	Vince
Cindy	Idalia	Ophelia	Whitney
Don	Jose	Philippe	
Emily	Katia	Rina	
Franklin	Lee	Sean	

* New names in 2023 replacing Harvey, Irma, Maria and Nate





Before The Storm

Triad Zone

- 8 Operations Centers
- 563k customers
- 4,200 square miles
- 197k poles, 137k OH transformers

Guilford County

- Greensboro Ops Center (197k cust)
- High Point Ops Center (62k cust)

- **Incident Management Team Engagement**
 - Monitoring weather
 - Modeling outage projections
 - Establishing a resource plan
 - Identifying off-system resource availability
- **Local IMT Preparations**
 - Facility & Vehicle Readiness
 - Checking material inventories & supplies
- **Public Information & Liaison Officers**
 - Working with state/local officials
 - Providing preparedness information



During The Storm

*** PUBLIC SAFETY ***

- **Avoid all downed power lines** and be sure to report them by calling: **800.419.6356**
- If a power line falls on your car, stay inside. If you must exit, jump clear.
- Never touch the car and ground at the same time.

- Monitoring conditions and pausing work when it's unsafe
 - Stop travel for steady winds ≥ 39 mph
 - Stop use of buckets for any wind ≥ 30 mph
- **Planning**
 - Adjusting resource plan to match actual storm impact
- **Logistics**
 - Finalizing plans for base camps & staging sites
 - Lodging & Meals
- **Initial damage assessment**



After The Storm

- Re-deploy resources to hardest hit areas
- Initial focus on:
 - Emergent – 911 Events
 - Critical customers/facilities
 - Damage Assessment
- Prioritized Restoration
 - Critical Customers/Facilities
 - Main circuits – backbone
 - Neighborhoods – Commercial Areas
 - Individual Services
- Providing updates to customers/communities
 - Estimated Time of Restoration

! Important storm restoration update >

Report & View Outages ▾

Outages in the Carolinas

⚡ Active Outages
364

Customers Without Power
4,039

OUTAGE HISTORY OUTAGE SUMMARY

Report Outages

To report an electrical outage, click below on REPORT OUTAGE or call 800.769.3766.

REPORT OUTAGE

Outages in the Carolinas

Important storm restoration update >

Search for a location

Report & View Outages ^ Map Options

Keyboard sh

**Report all outages
800.769.3766**

www.duke-energy.com/outagemap

Grid Improvement in North Carolina



IMPROVE RELIABILITY
AND RESILIENCY
to avoid outages and
speed restoration

Building a smarter grid for **YOU**



STRENGTHEN THE GRID
against physical
and cyber impacts



GIVE MORE OPTIONS AND CONTROL
over energy use and tools
to save money



EXPAND SOLAR AND
RENEWABLES
across a two-way,
smart-thinking grid



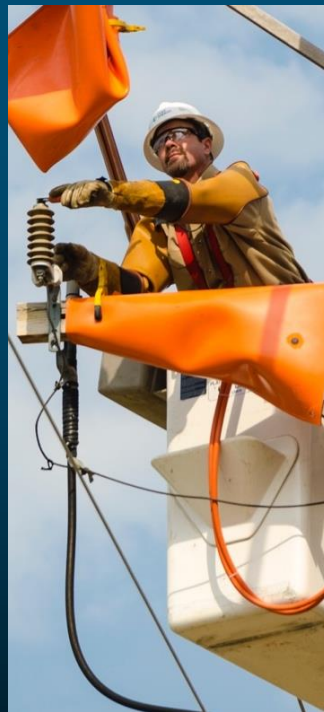
Grid investments by the numbers:

\$300 million total regional grid investments between 2018-2022

110,000 customer outages avoided between 2017-2021

400,000 hours total outage time avoided between 2017-2021

214,000 customers benefited



QUESTIONS?

