



# Cape Fear River Partnership: Water Quality Workgroup

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Environmental Biologist/Monitoring Coalition Program Coordinator: Division of Water Resources

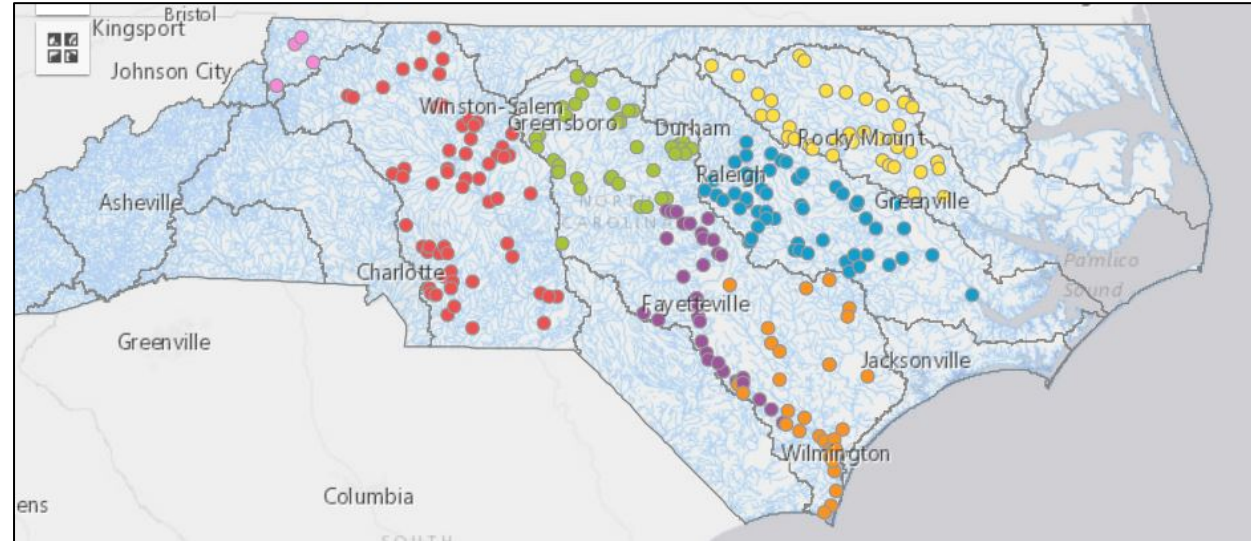
June 21, 2023

*North Carolina Department of Environmental Quality*



# *NC DWR Monitoring Coalition Program*

- Monitoring Coalitions are groups of stakeholders that combine resources and expertise to fund and perform in-stream water quality monitoring.
- Monitoring compliments, and is performed in coordination, with the Division's Ambient Monitoring Program
- Monitoring Coalition Program Coordinator
- Six Coalitions in 4 major water basins
  - Upper, Middle and Lower Cape River
  - Tar-Pamlico, Yadkin Pee Dee, and Lower Neuse
- Total annual budgets = \$1,000,000
- Water quality monitoring = \$704,000
- Monitoring stations = 254 sampled monthly, 2X summer
- Data generated = 36,000 records annually with a compiled dataset of 1,031,183 records
- Data used in planning, modeling, NPDES permits, USEPA triennial report (AKA 303d impairment list), research, special studies.....



# Jordan Nutrient Rules Readoption: Timeline

(as of 6/2023)

- Latter 2023 Lake model completion, external review, model finalization
- Fall 2023 - 2024 Facilitated stakeholder engagement Part 1 -> rule concepts
- Fall 2024 - Spr 2025
  - Rules text development
  - Stakeholder engagement Part 2 -> draft rule revisions
- 2025 Formal rulemaking approval, fiscal analysis, public hearings and comment period
- 2026 Rules finalized, EMC adoption, RRC approval, Rules effective

# *NC DWR Algal Assessment Program*

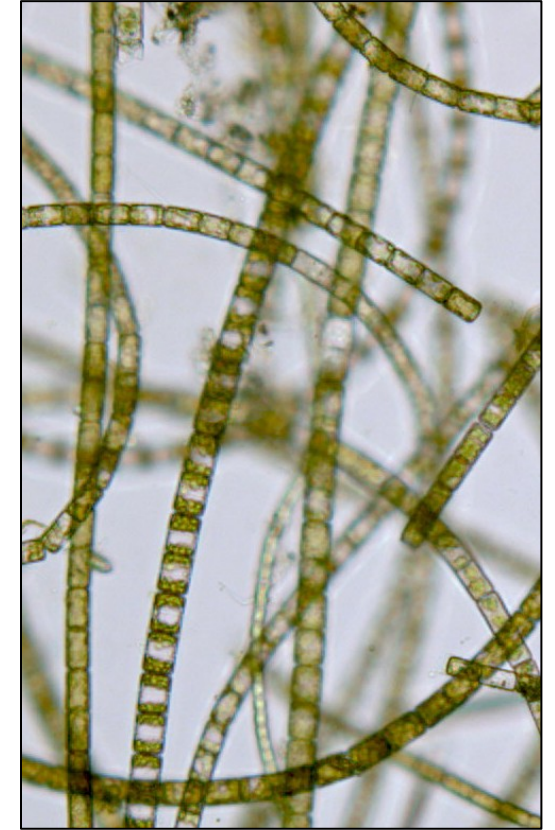
- NC DWR Program started circa 1980 with USEPA Clean Lakes Program
- Program focus and laboratory capabilities
  - Routine: Ambient Lakes Monitoring Program
    - Selected specific sites evaluate over time with focus on water supplies and recreational waters
    - 30-40 sites/month  $\approx$  200-220 samples/year
  - Episodic: Bloom response and assessments
    - Algae and associated microbial growths (i.e., bacteria, fungus and protozoa)
- Strong relationship with Division of Health and Human Services (DHHS)
  - Cyanobacteria and cyanotoxins.
- Goal: Work with other state agencies, municipalities/lake managers, academic institutions and other water quality groups/agencies to provide a coordinated response to potential Harmful Algal Blooms





# *Is it Algae?*

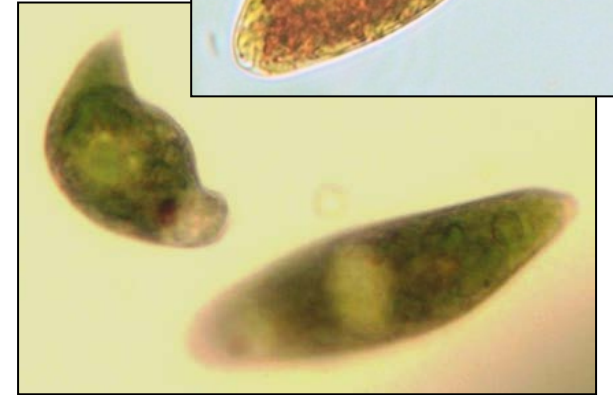
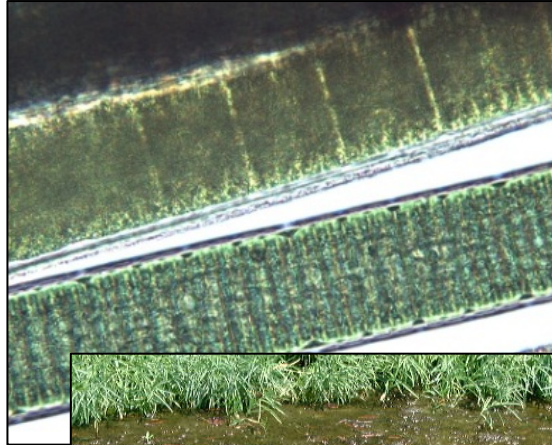
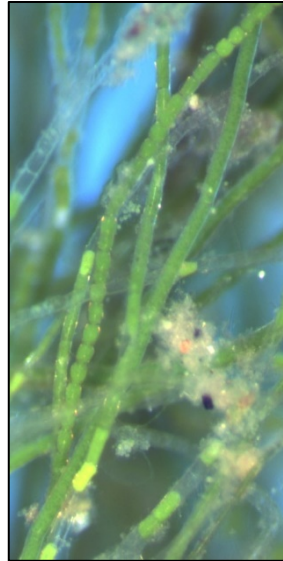
- An artificial grouping of somewhat related photosynthetic organisms
- Microscopic, macroscopic, unicellular, colonial or filamentous
- Phytoplankton: free floating and motile in water column
- Filamentous: stringy, mat forming
- Periphyton: attached or gliding (motile diatoms)
- Macro algae confused with Aquatic Plants (i.e., Nitella)
- Aquatic plants confused with algae (i.e., Duckweed)





# *Is it Algae?*

- Visually, algae can be:
- Phytoplankton: paint-like, discolored water, flecks or films
- Filamentous: stringy, slippery/silky
- Periphyton: furry



- Magnification often required to confirm it is algae



# *Algae ≠ Duckweed*

- Duckweeds, a group of floating aquatic plants
- Size, texture and roots
- Float on quiet or slow flowing waters
- Unsightly but harmless





# *Is it an Algal Bloom?*

- No clear definition
- Excessive or visual growths
- Quantified as biovolume, unit or cell density
  - 10,000 units/ml or 5,000 mm<sup>3</sup>/m<sup>3</sup>
- DWR Algal blooms = Nutrient pollution
- Physical (Metered) data
  - Dissolved Oxygen 110% saturation
  - pH > 8 s.u.
- Chemical
  - Chlorophyll-a > 40 ug/l





# *Cape Fear River Microcystis Blooms 2009-2012*

- Microcystis blooms began in 2009
- First documentation of cyanotoxins in and near water supplies
- Fostered interagency roles, responsibilities and capabilities
  - Monitoring, sampling and **COMMUNICATION**
  - DWR Biologists, Regional Offices, Public Water Supplies, ACOE, DHHS, Academics and **PIOS**
  - Press releases and public notification
- Synoptic study in 2010
  - 16 stations sampled on the same day
  - 5 sampling events in one season
  - No blooms, but GREAT DATA
    - Ambient phytoplankton, nutrients and chl-a
- Blooms returned 2011
  - Earlier coordination pays off
  - Documentation of “visible algal growths”
  - Lasted 7 weeks and stretched 70 miles at peak
  - Cyanotoxin data collected
    - Ambient and Finished Drinking water




# NC DWR Algal Bloom and Fishkill Dashboard 2023

- Reporting comes from phone calls and emails to Regional Offices or Central Lab, or via Dashboard
- Developed to allow the public to easily report and track events across the state
- Two components
  - Reporting form (Survey123)
  - Dashboard (ArcGIS)
  - Find links for both at [algae.nc.gov](https://algae.nc.gov)
- Total reports on dashboard: 439
  - 308 algal blooms




**DWR Citizen Report**




**DWR**  
Division of Water Resources

Use this app to report a fish kill or algal bloom to the N.C. Division of Water Resources. If you prefer, call our emergency hotline instead at 1-800-858-0368. Reports received through this app are reviewed during normal business hours and further evaluation is prioritized by event severity and available resources.

**Current Date & Time**

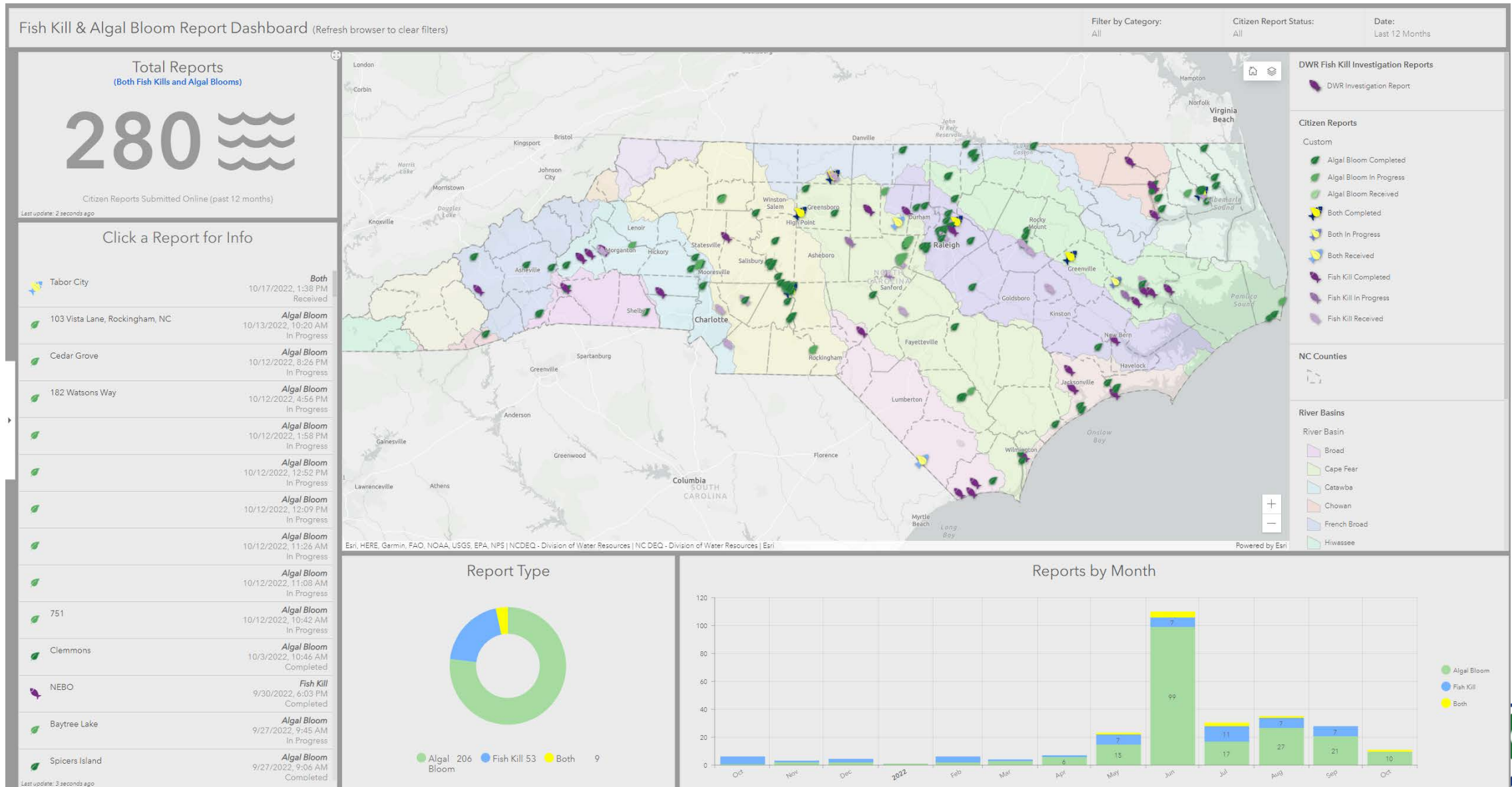
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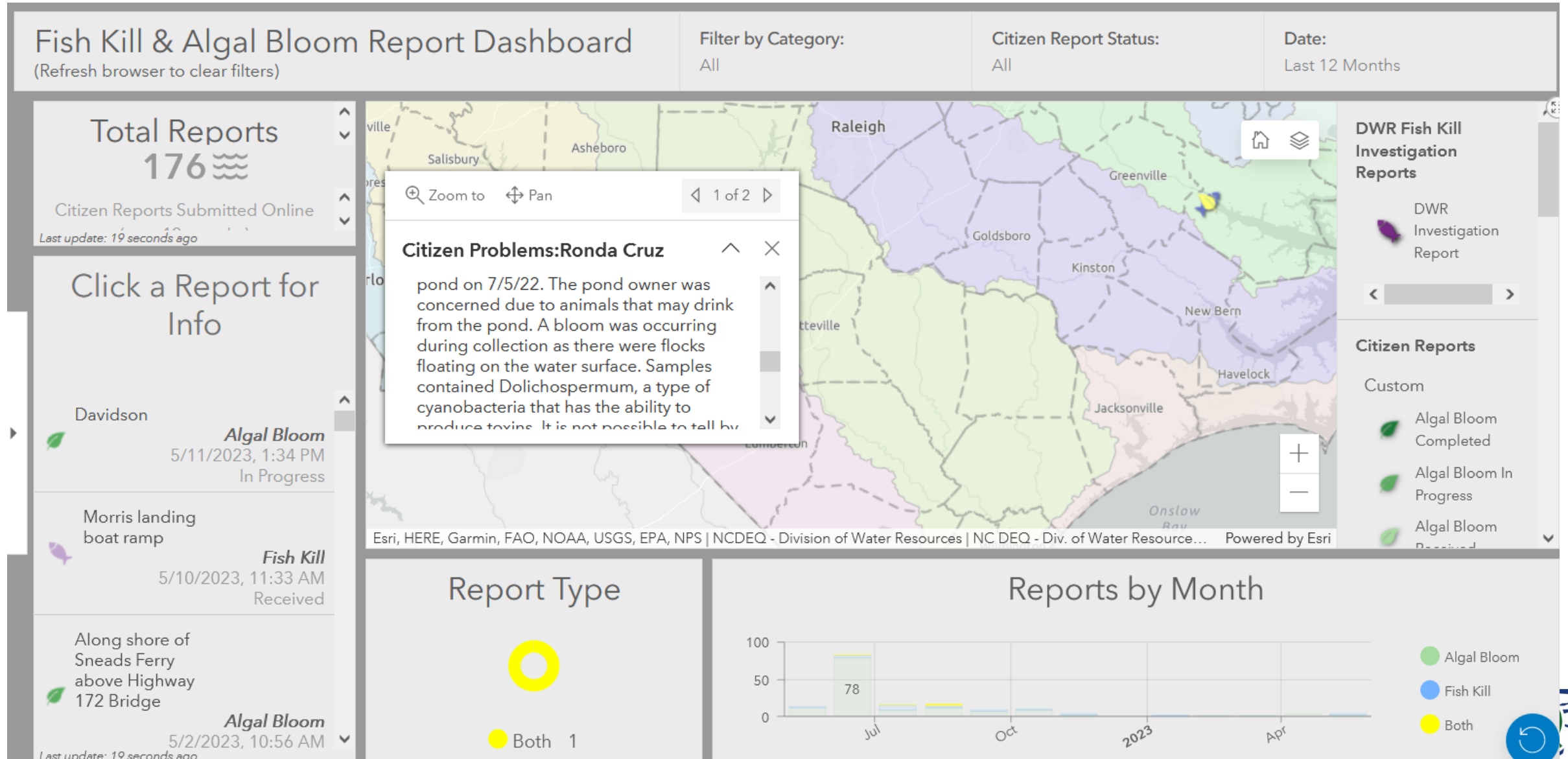
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# NC DWR Algal Bloom and Fishkill Dashboard 2023



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# Contact Information

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Standard Operating Procedures Manual:  
Algal Bloom and Cyanotoxin – Field Collection

