DEQ Water and Fish Study Presentation:
Saltwater Samples

NC Secretaries' Science Advisory Board Meeting
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Project Information

Overview

- PFAS are persistent contaminants that have unknown impacts in many environments.
- In North Carolina, the Chemours facility is a source of PFAS contamination into the Cape Fear River.
- The Cape Fear River runs over 300km and serves as a drinking water source for NC residents.

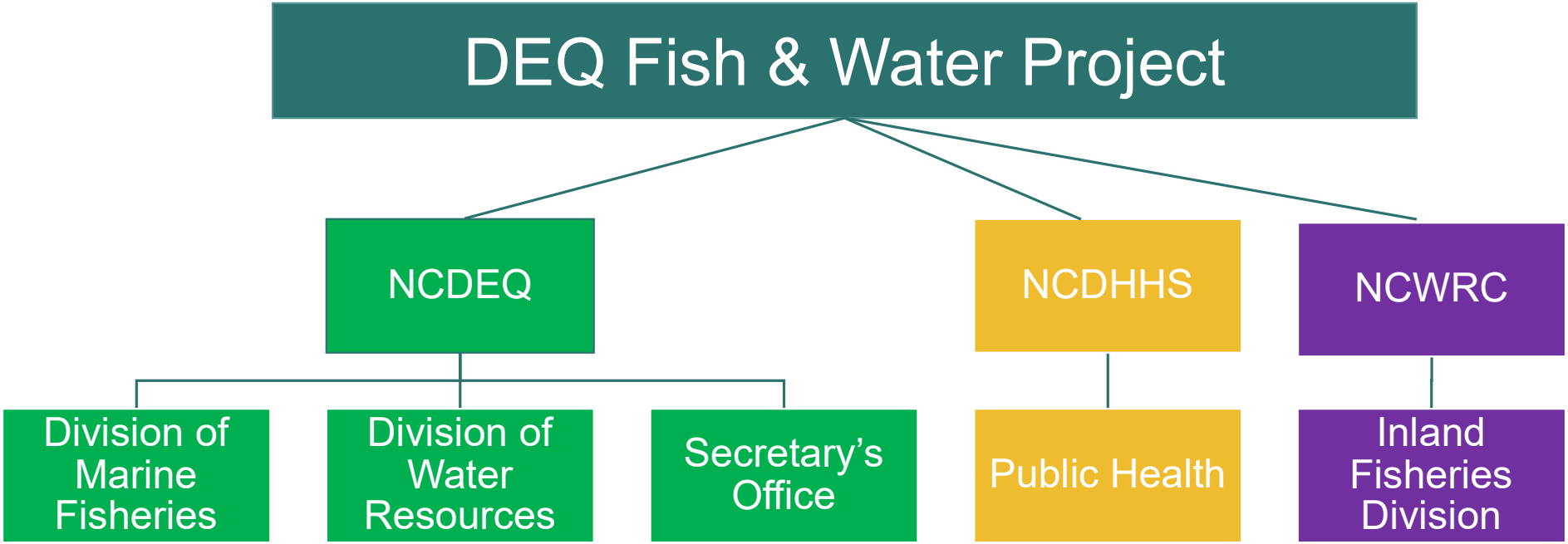
Goal

- To examine the extent of the PFAS contamination.
- To better understand bioaccumulation of PFAS.
- To collect fish tissue data for development of fish consumption advisories.

Details

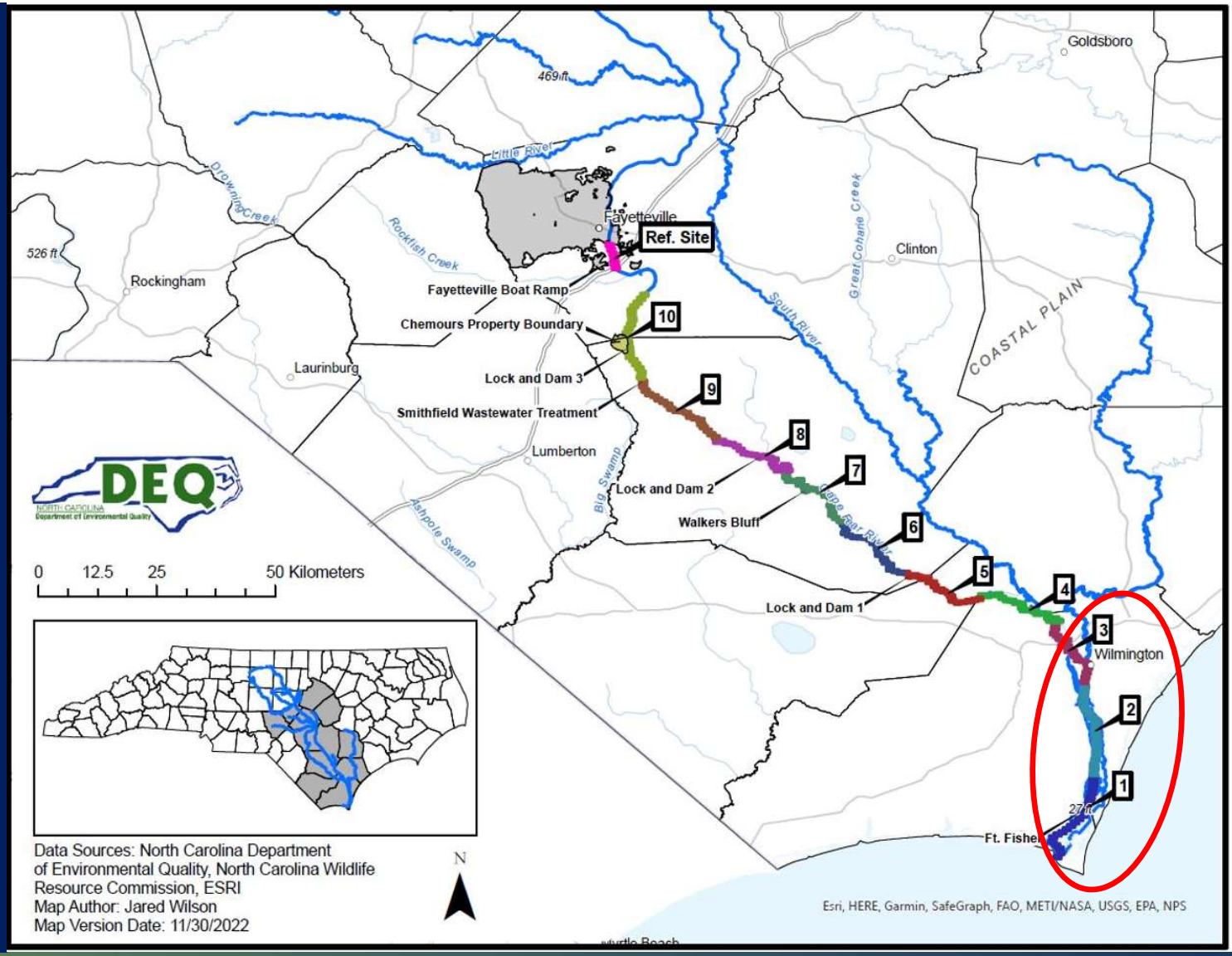
- June – August 2022: 200+ fish were collected from the Cape Fear River.
  Most frequently caught and consumed fish species in the Cape Fear Region.
- Oct 2023 – Additional fish collected from Lower Cape Fear, sampled analyzed through Spring 2024.
- The fish fillets were analyzed alongside water samples collected in situ for 56 different PFAS

Project Partners



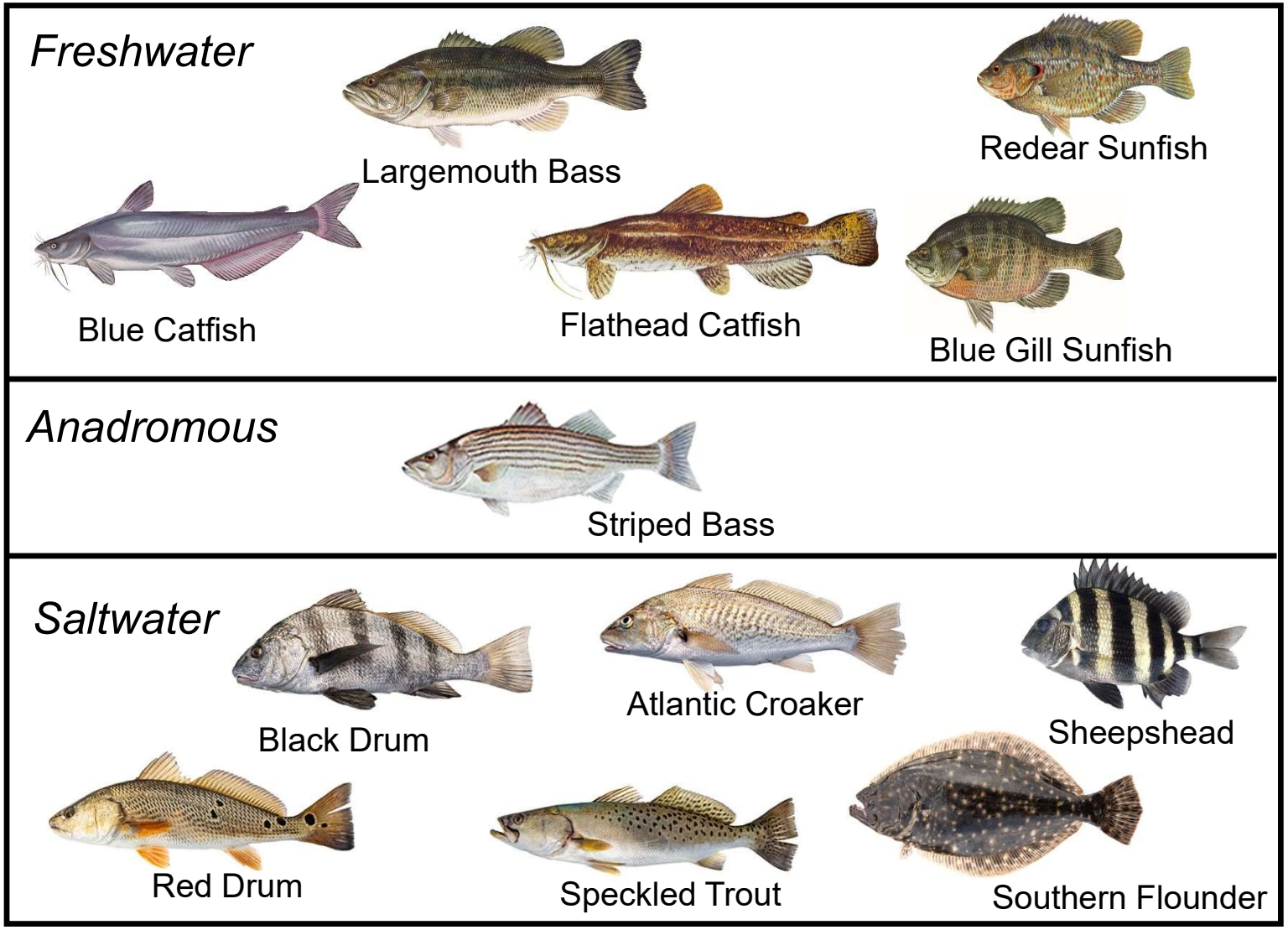
Sampling Locations

- The Cape Fear River was divided into eleven 20km segments beginning south of Fayetteville, NC.
- Freshwater data presented previously.
- Saltwater data is presented here.



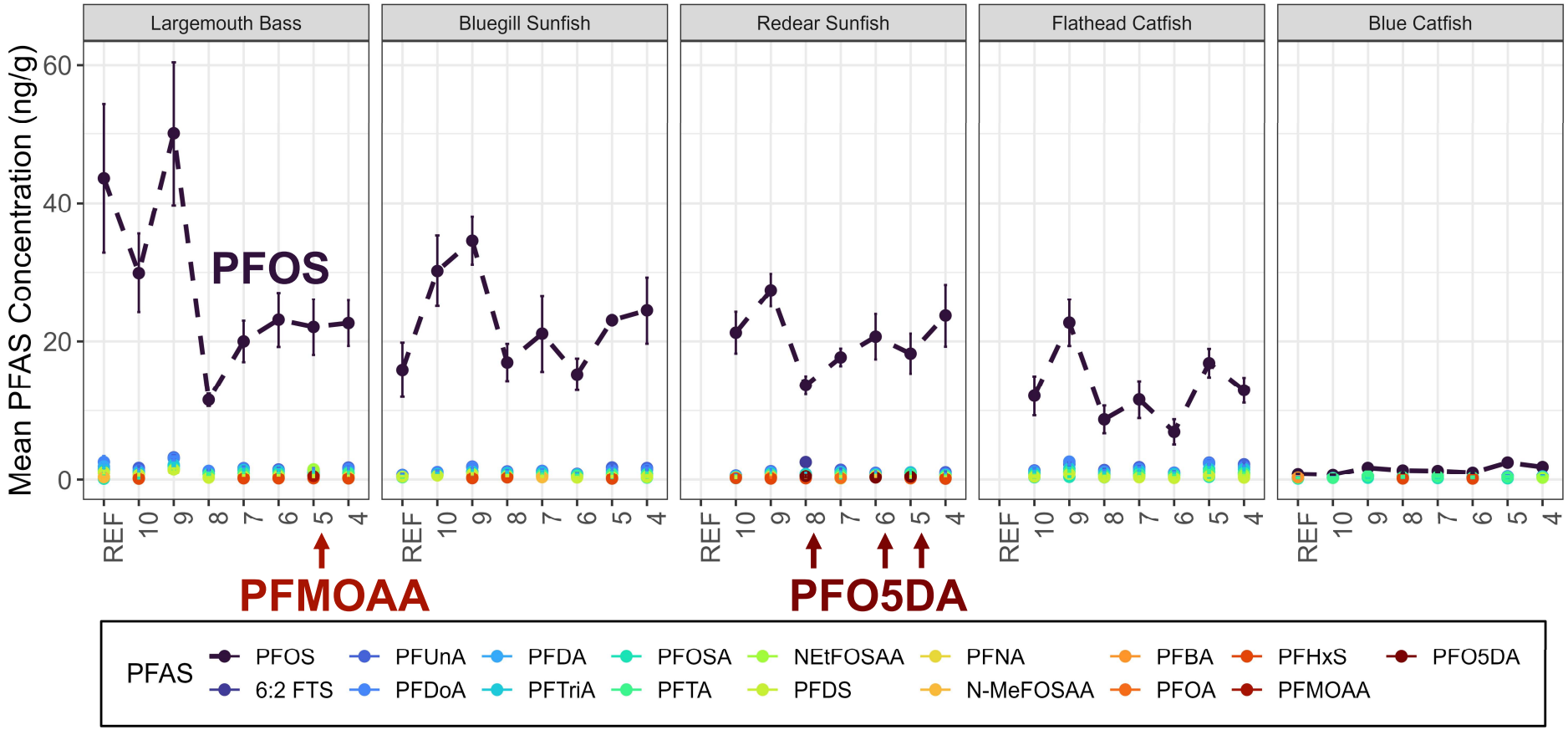
Fish Species Collected

Different species were caught in different sections of the Cape Fear River.



Freshwater Data Recap

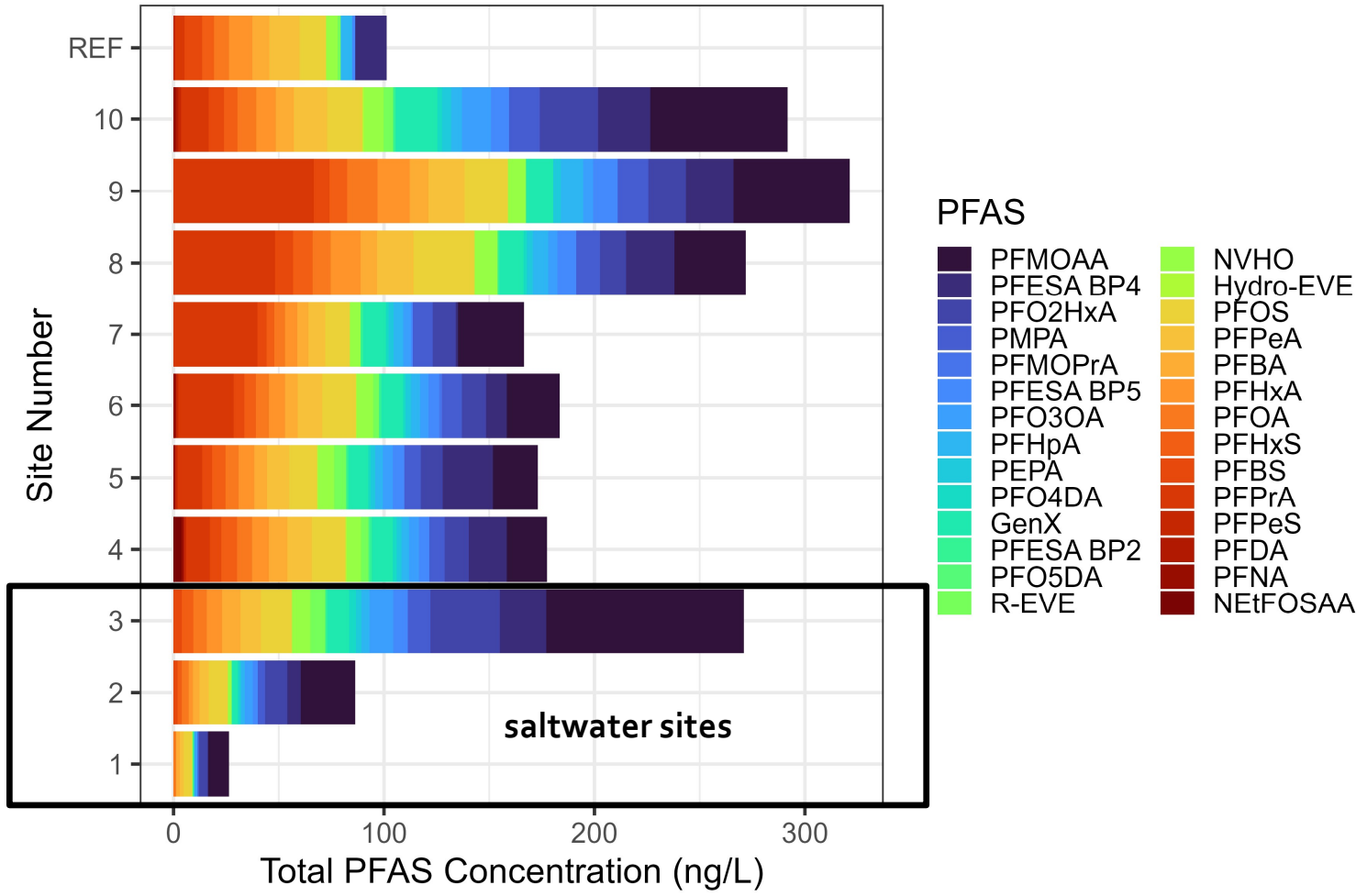
- **PFOS** is the predominant PFAS in fish tissues
- **PFMOAA** and **PFO5DA** are detected in at least one fish fillet
- There are **no spatial trends** for PFAS in fish tissue



Surface Water

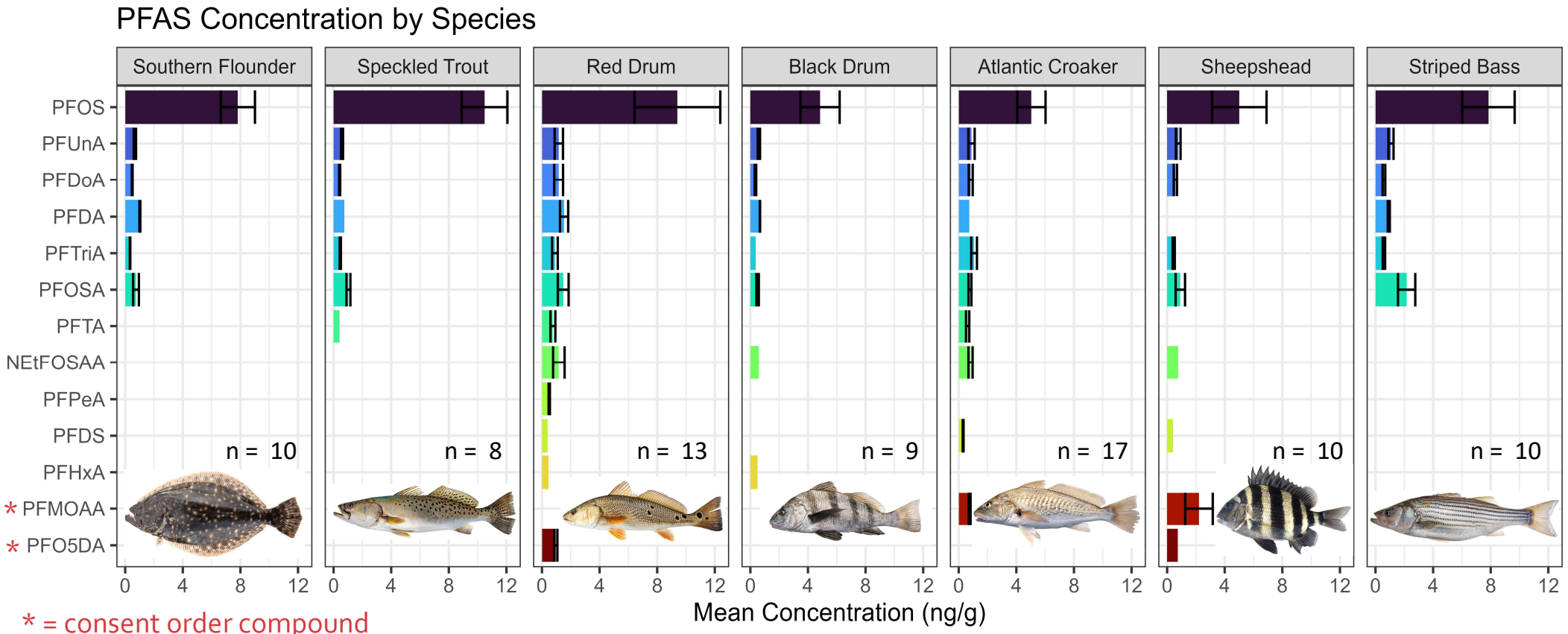
PFMOAA is **consistently** detected in **surface water;**

highest in concentration at all **saltwater sites,** and some freshwater sites



Preliminary Data

PFOS is detected in all saltwater fish species sampled.

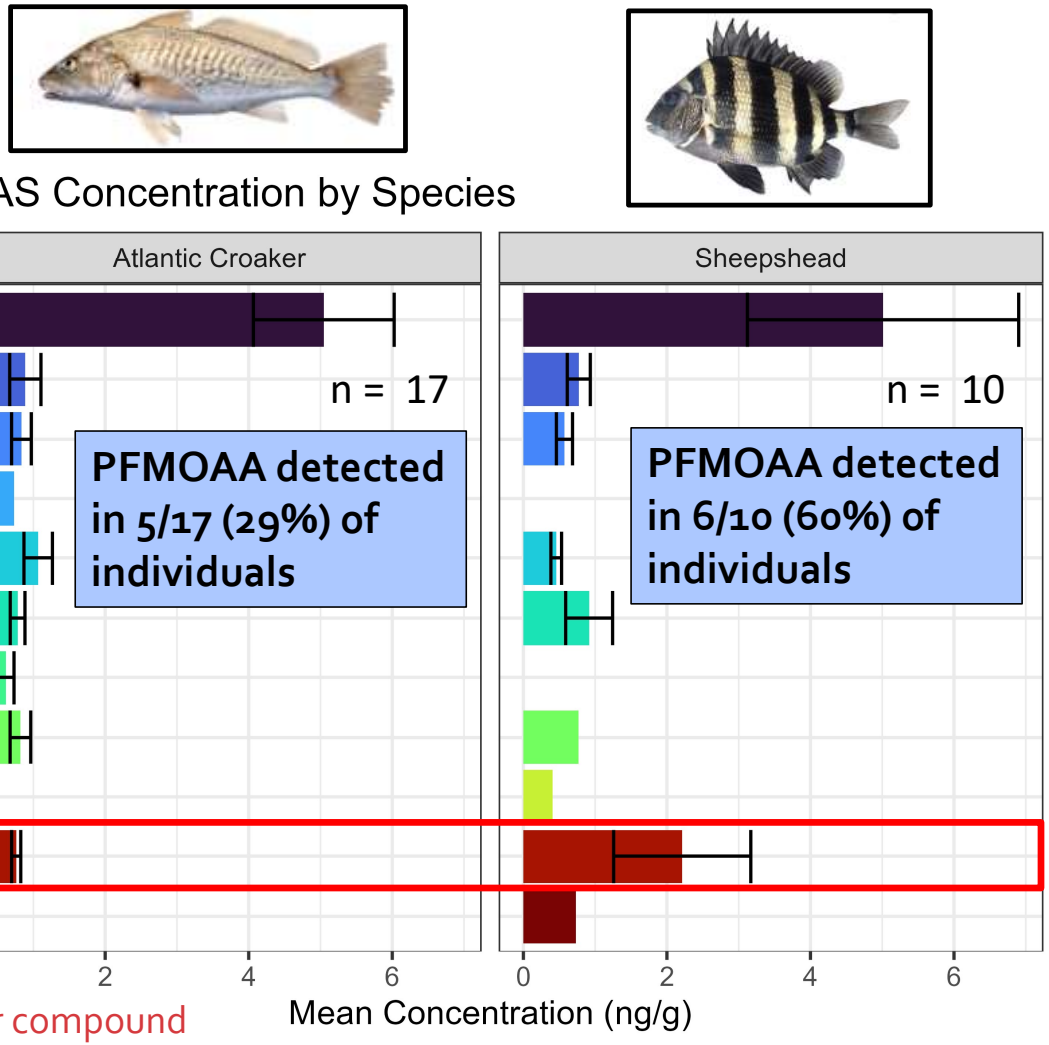


* = consent order compound

Preliminary Data

Chemours PFAS

PFMOAA was detected in Atlantic Croaker and Sheepshead

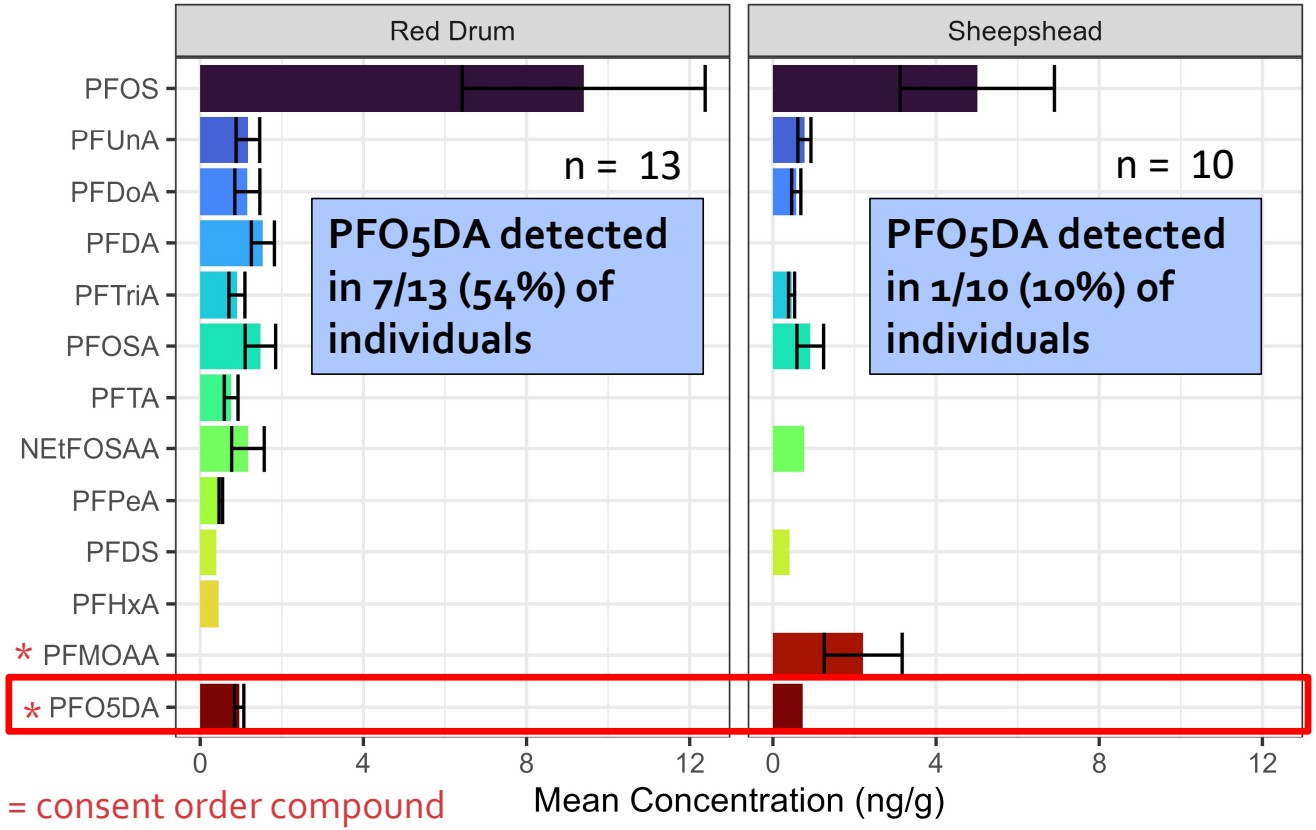


* = consent order compound

Freshwater Comparison: PFMOAA was detected in 1 of 36 (3 %) Largemouth Bass at a concentration of 0.5 ng/g.

Chemours PFAS

PFO5DA was detected in Red Drum and Sheepshead



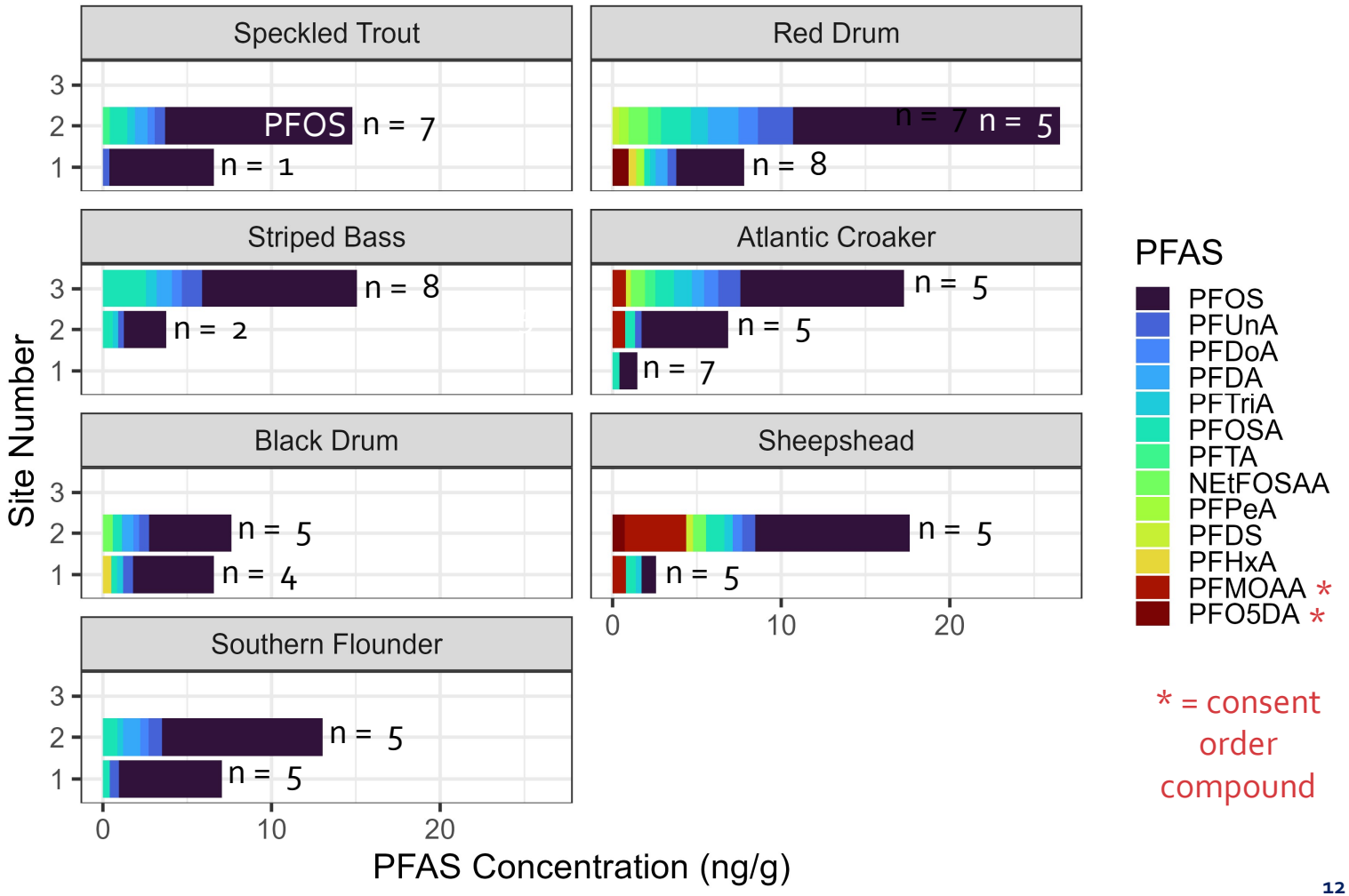
* = consent order compound

Freshwater Comparison: PFO5DA was detected in 4 of 34 (12 %) Redear Sunfish at a median concentration of 0.403 ng/g

Preliminary Data

Site & Species Differences

Total PFAS concentration ***decreases across sites***



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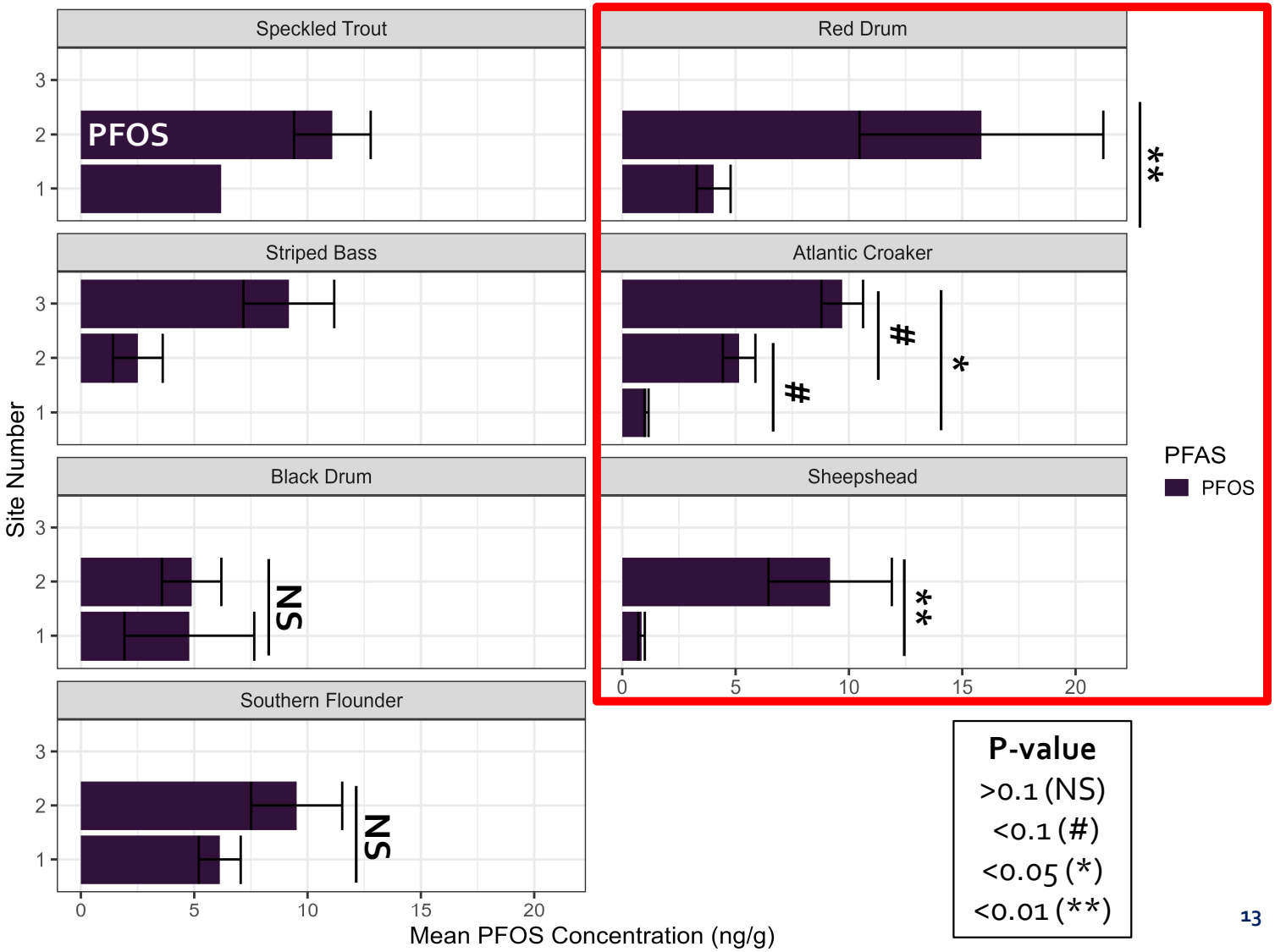
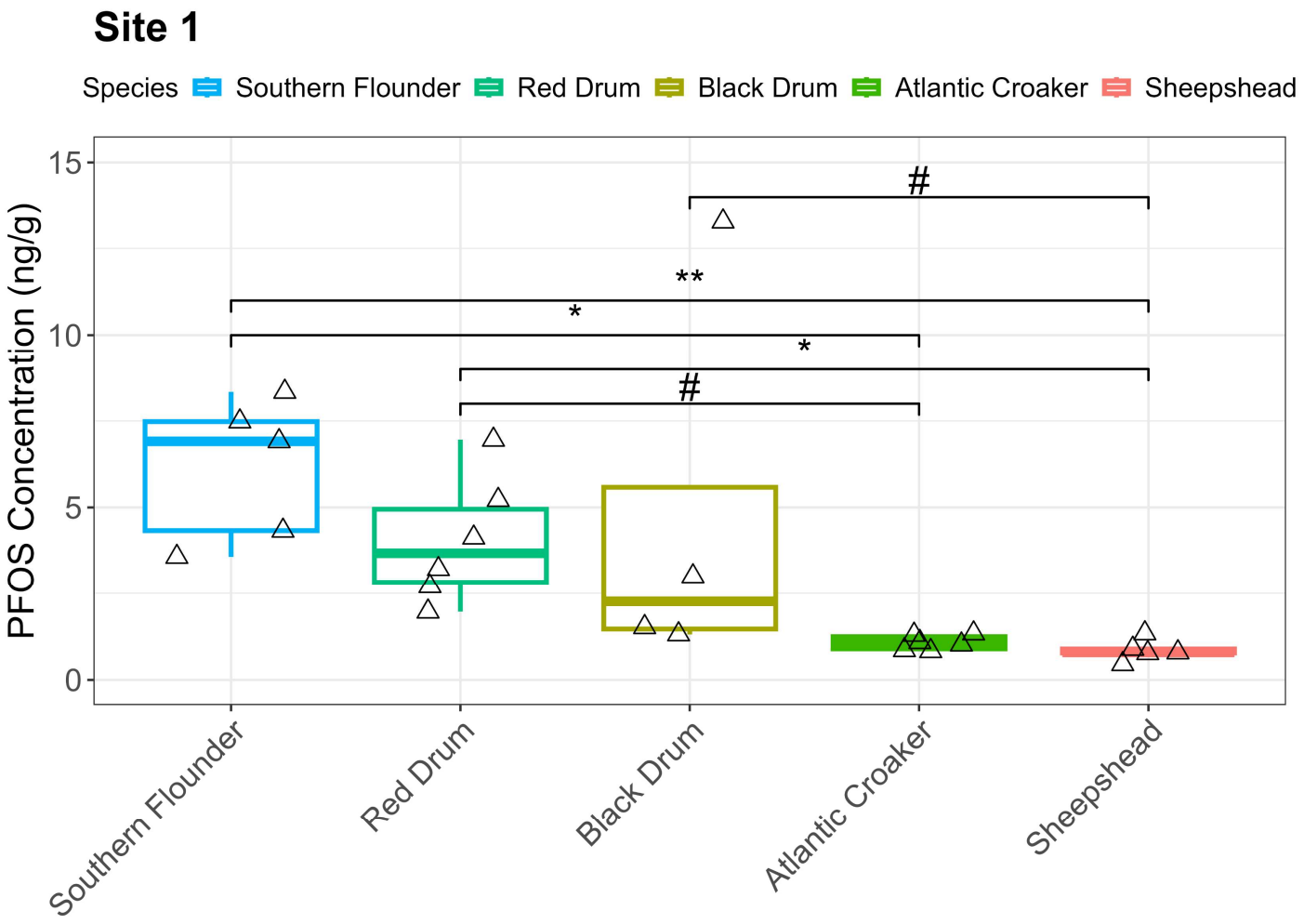
Preliminary Data

PFOS *Concentration* ***differs between sites*** for Red drum, Atlantic Croaker and Sheepshead



Preliminary Data

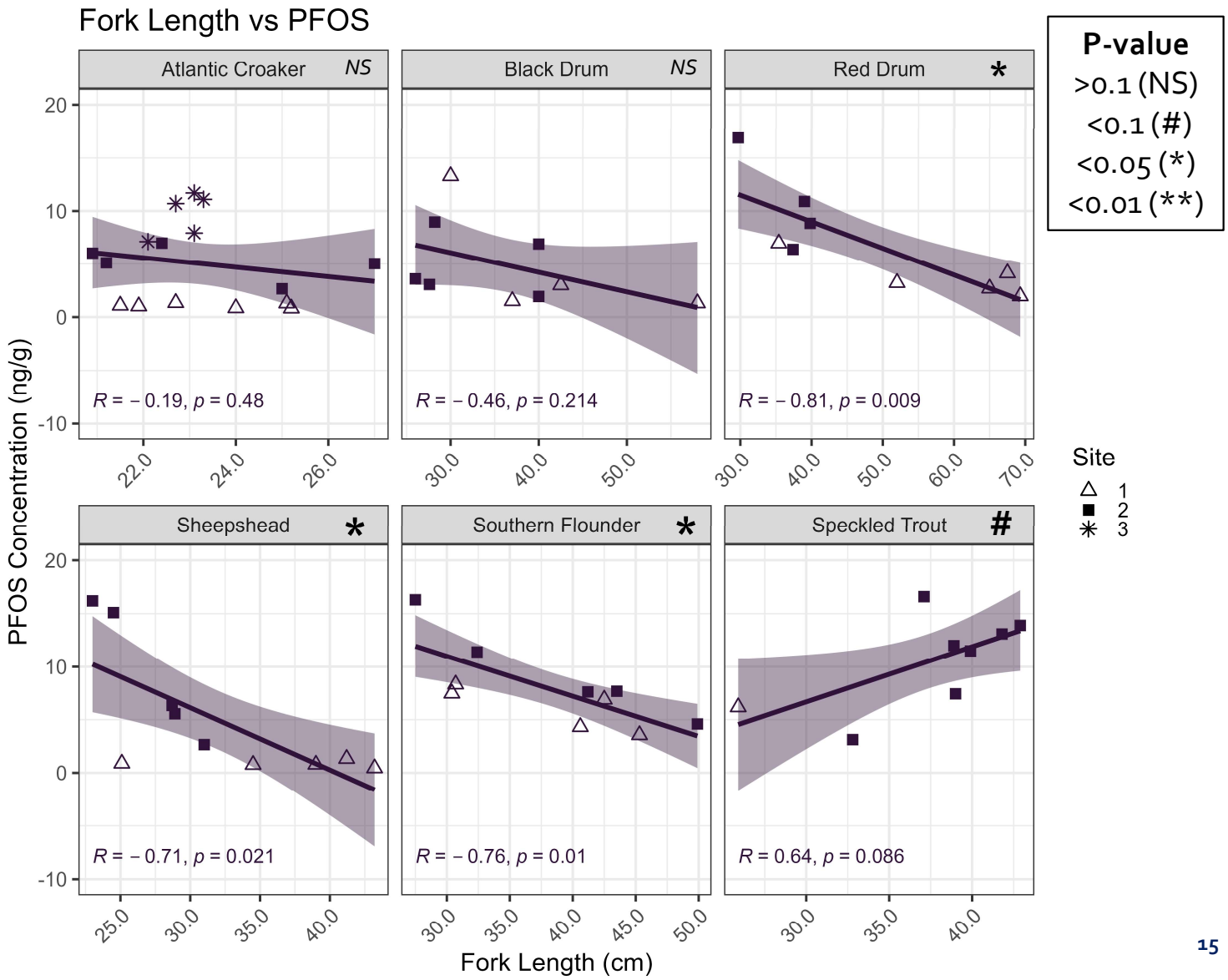
Evident differences in PFOS Concentration between Species at Site 1



P-value
>0.1 (NS)
<0.1 (#)
<0.05 (*)
<0.01 (**)

Preliminary Data

Fork Length vs PFOS



Preliminary Data

Summary of Saltwater Data Presented

1. **PFMOAA is detected in surface water at all sites**
2. **PFOS is detected in all fish species at all sites**
3. **Consent order compounds PFMOAA and PFO5DA are detected in saltwater fish tissue**
   - Croaker (PFMOAA), Red Drum (PFO5DA), Sheepshead (both)
4. **PFOS concentration differs by <u>site and species</u>**
   - PFOS concentration decreases across sites for Atlantic Croaker, Sheepshead, and Red Drum
   - Atlantic Croaker and Sheepshead have significantly lower PFOS concentrations from other species at site 1

Preliminary Data

Next Steps:

Design monitoring strategy for waterbodies across the state.

Collaborate with EPA, state and academic researchers to expand capacity.

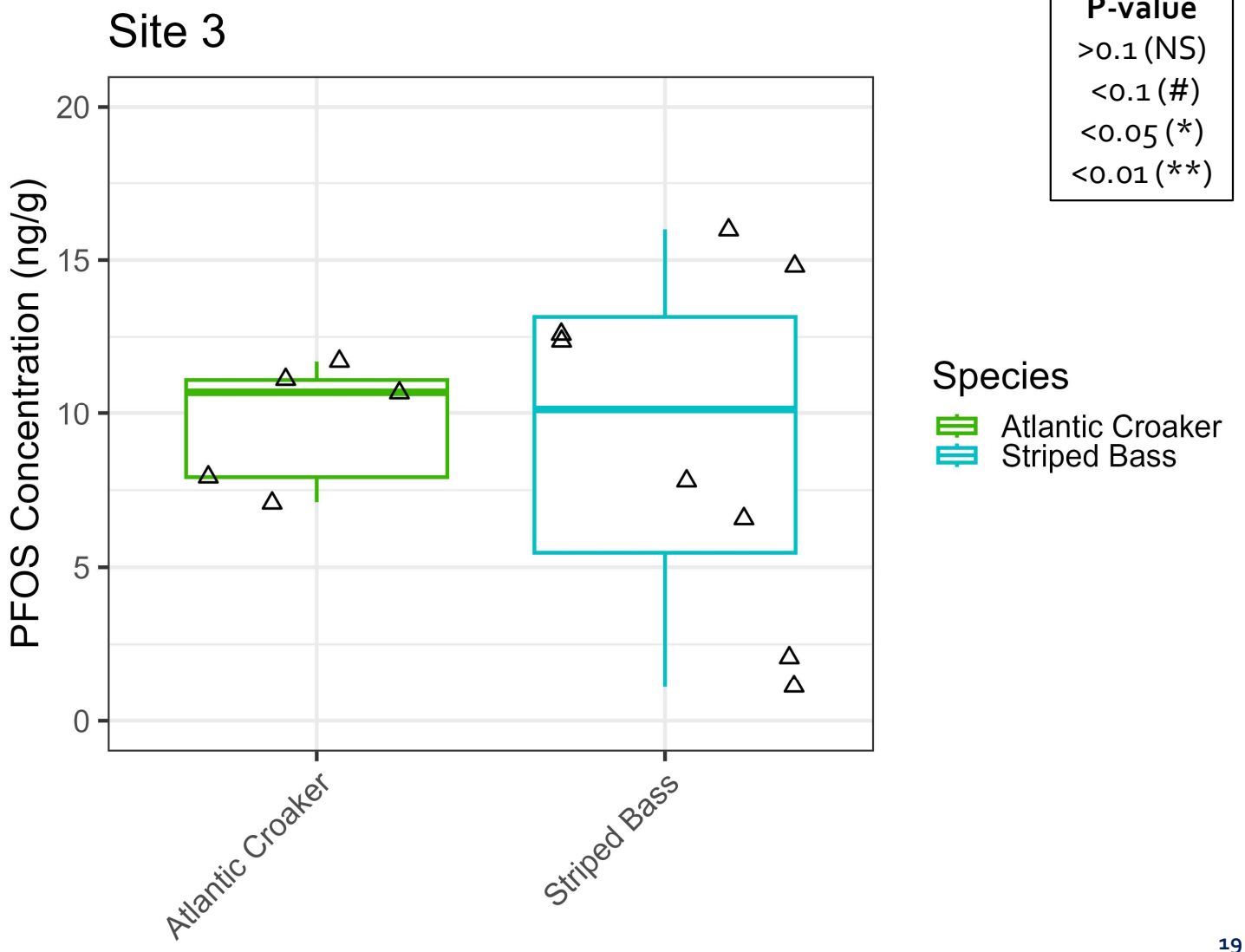
Share with local and state officials; Discuss with policy makers.

Thank you

Department of Environmental Quality

Species Differences – Site 3

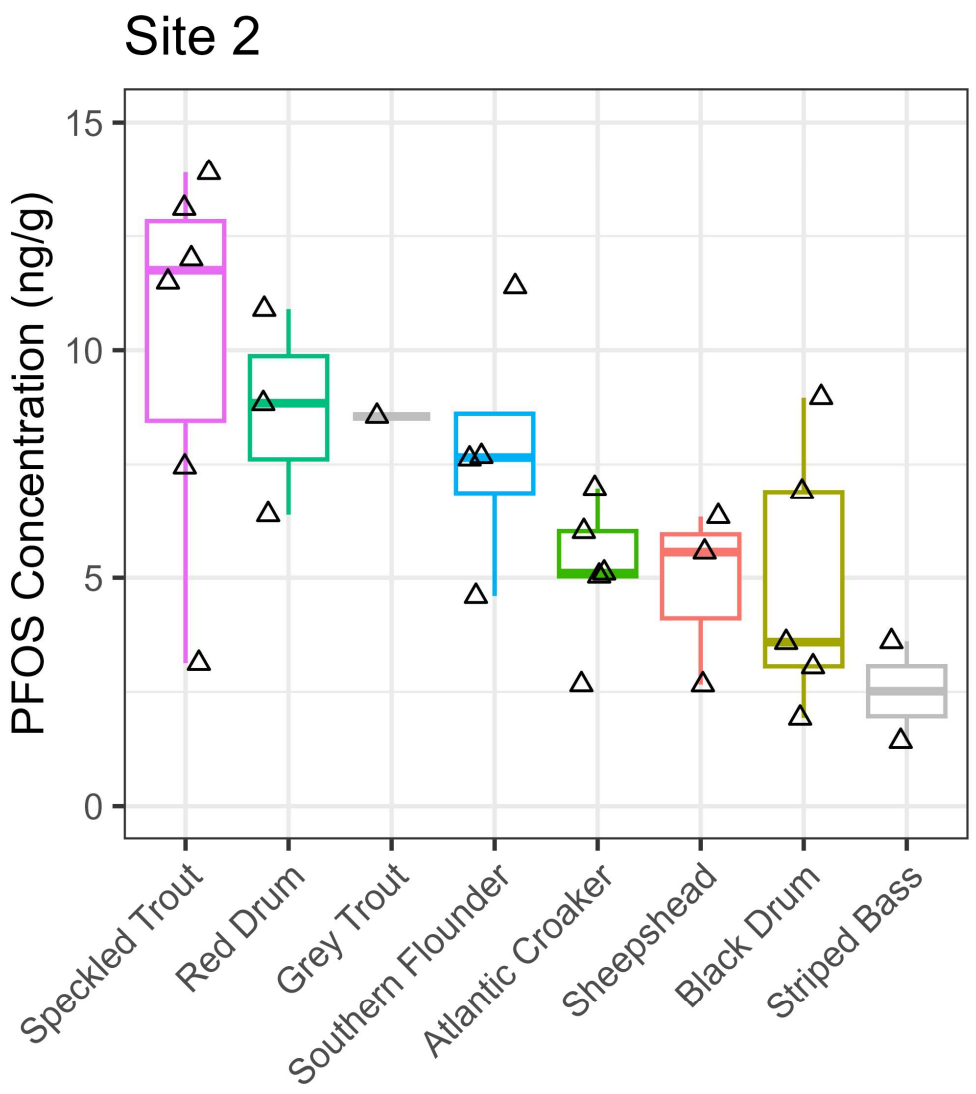
No differences in PFOS Concentration between Species at Site 3



Preliminary Data

Species Differences – Site 2

No differences in PFOS Concentration between Species at Site 2



P-value
>0.1 (NS)
<0.1 (#)
<0.05 (*)
<0.01 (**)

Species
- Speckled Trout
- Red Drum
- Grey Trout
- Southern Flounder
- Atlantic Croaker
- Sheepshead
- Black Drum
- Striped Bass

Preliminary Data