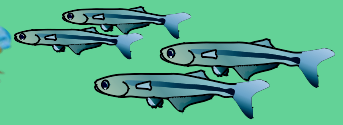
Forage Monitoring by Citizen Scientists: Progress & Potential

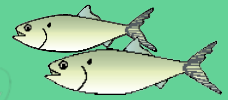
Tom Ihde and Caroline Troy

Forage Action Team Meeting, 21 August 2019 - NCBO

Background

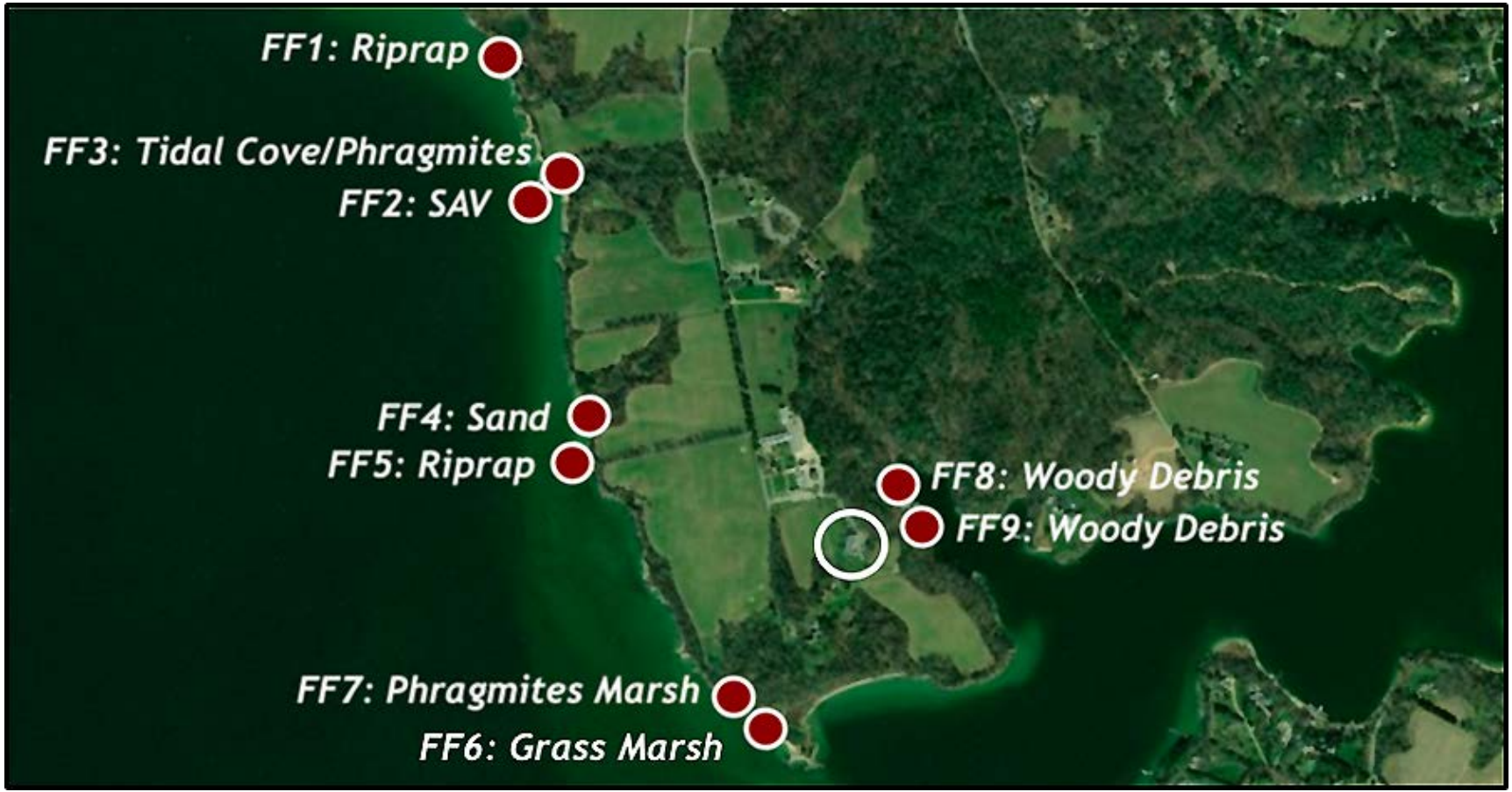




- 2015 - Data gap identified – STAC Forage Workshop
- 2017 (fall) - Piggy-backed on SAV C.S. H-GIT funding: forage sampling
  - 4 C.S. groups & PEARL
- 2018 (winter) - NCBO was able to acquire some gear to get new partners established
- Work continues opportunistically; non-funded
  - This summer – PEARL 10 wks of intern funding through another project
  - Accomplished a lot:
    - ✓ Organized & entered all previous samples from 2017
    - ✓ Streamlined data entry
    - ✓ Lots of new SoMD samples
    - ✓ Engaged (2) new C.S. groups, and re-engaged (1) partner from the 2017 work

PEARL Sampling Sites



Sampling: Sites

FF7: Phragmites Marsh

FF9: Woody Debris Habitat

FF2: SAV Habitat

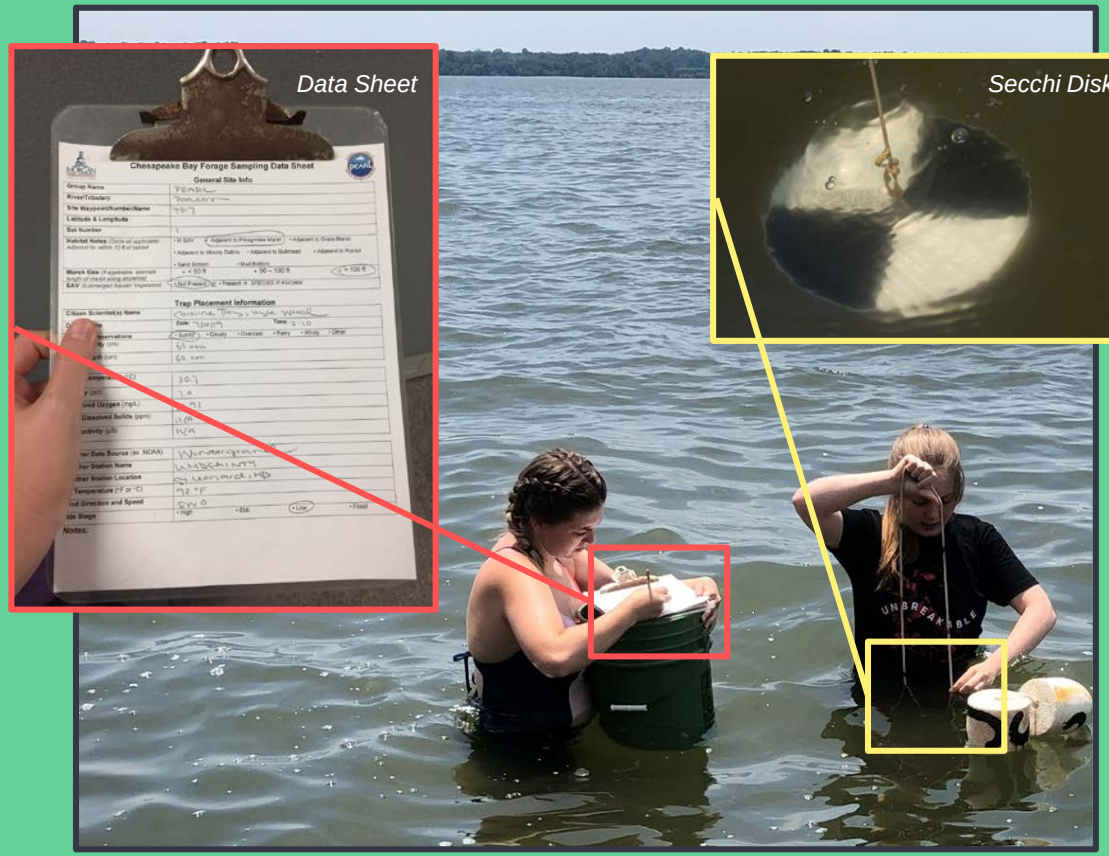
FF4: Sand Habitat

FF8: Woody Debris Habitat

FF1: Riprap Habitat

Sampling: Water Quality & Weather

Taking water quality with YSI Handheld



Recording Secchi Depth

Sampling: Checking Traps

Pulling up traps

Opening Traps

Eel and seaweed in trap

Sampling: Recording the Catch

American Eel

Striped Blenny

Mummichog

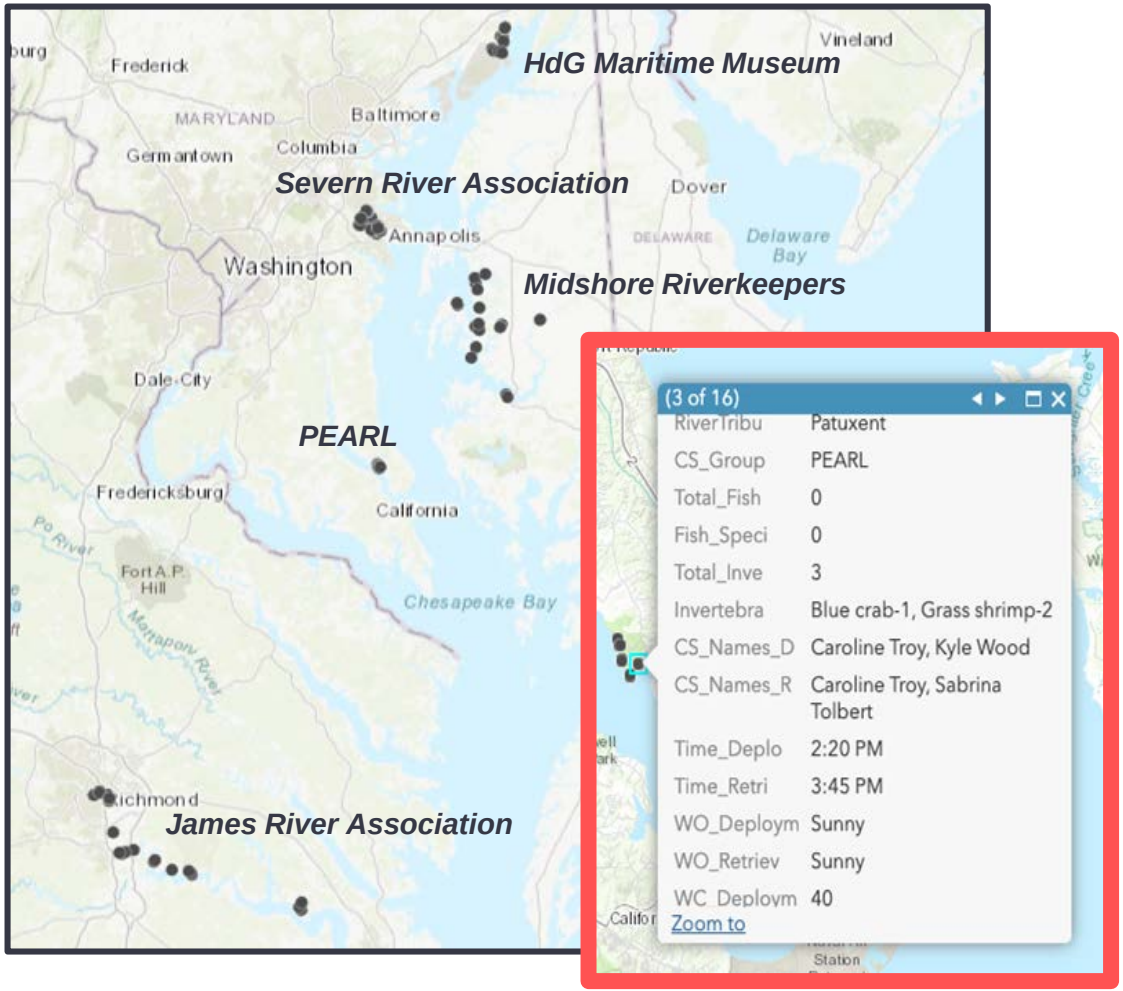
Shrimp

American Eel

Spotted Seatrout

Data Compilation

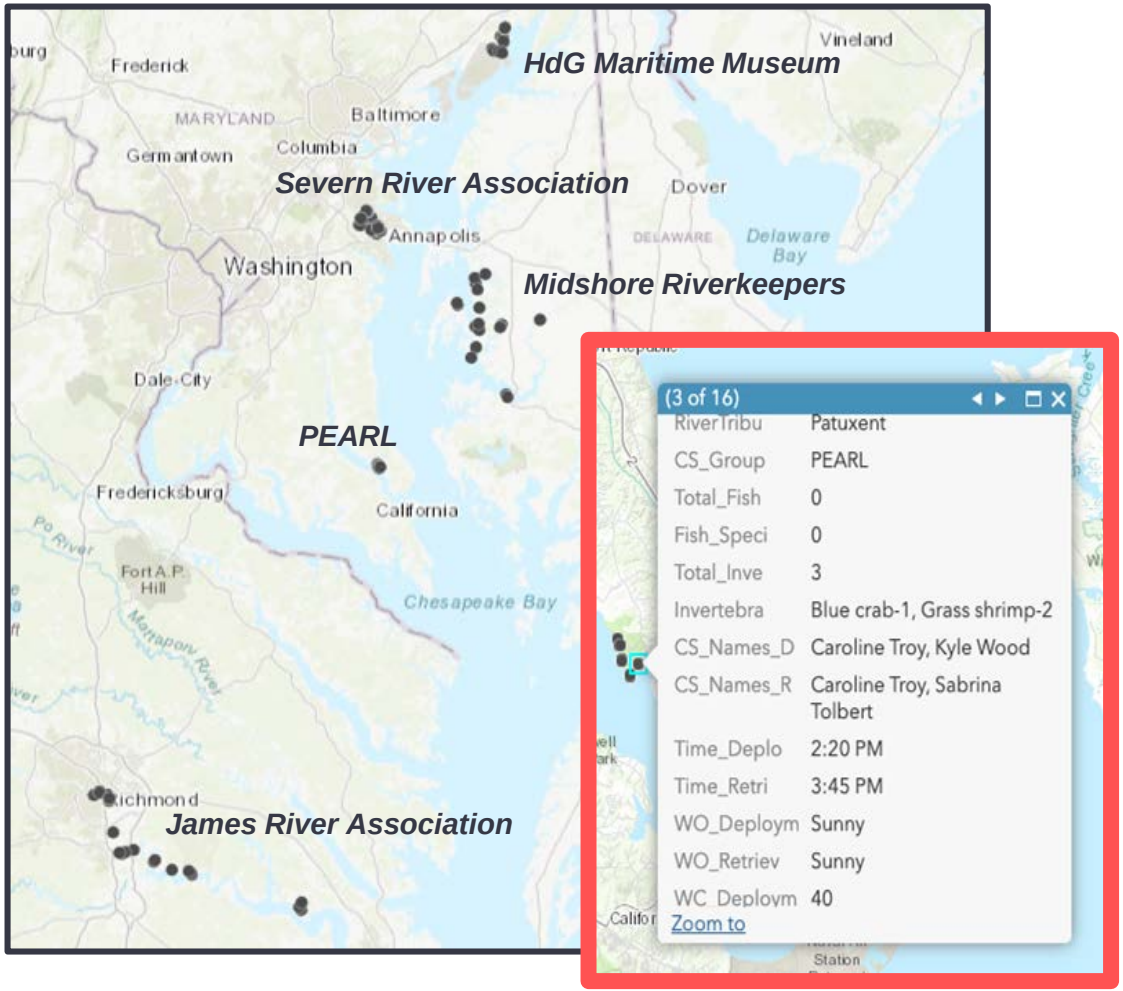
- ~300 observations from five datasets since project start in 2017



Data Compilation

- ~300 observations from five datasets since project start in 2017
- Live map now available:

http://www.arcgis.com/home/webmap/viewer.html?webmap=191d0819374c427f8aa48cd8ded049e9&extent=-76.5402,38.3834,-76.4561,38.4171



Preliminary Data Analysis

- All Data:
  - Trapping Duration – Trap Saturation
  - Catch vs. Water quality parameters
    - ✓ Water temperature
    - ✓ Salinity
    - ✓ Dissolved oxygen
    - ✓ Water clarity
  - Catch vs. Habitat type

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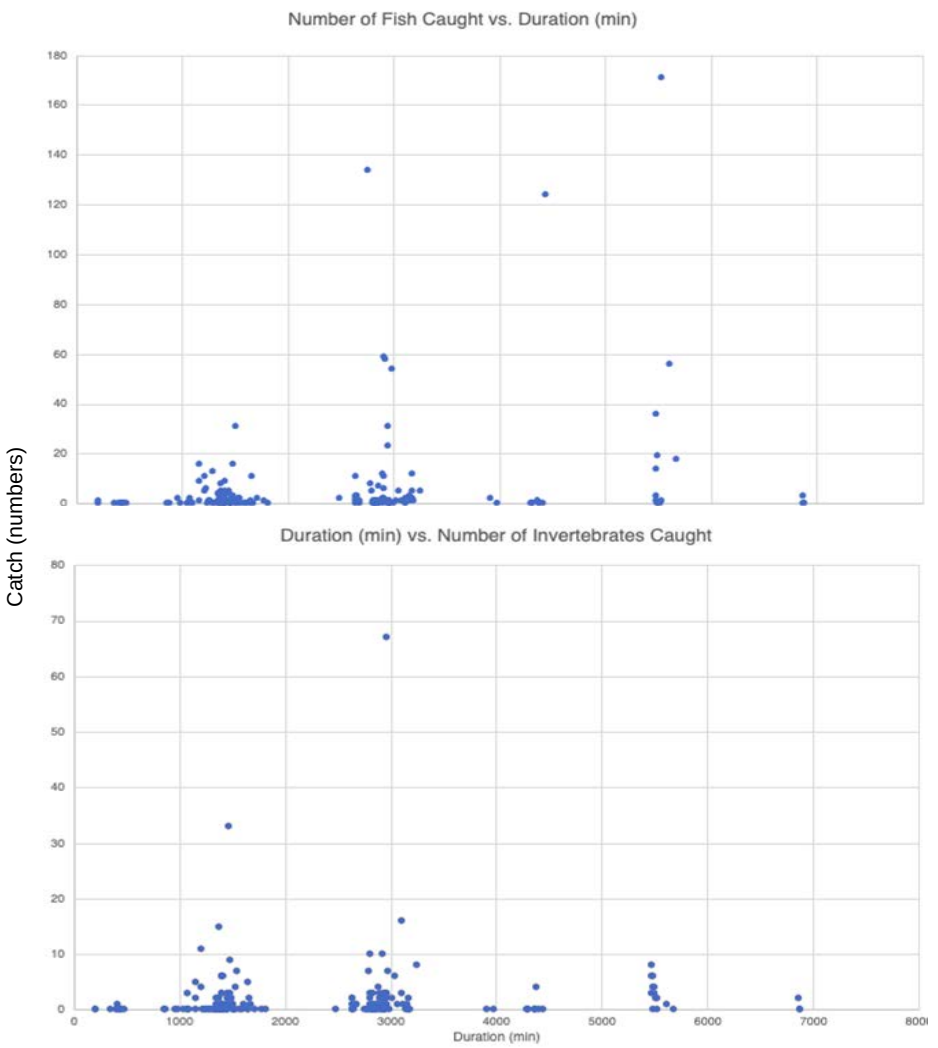

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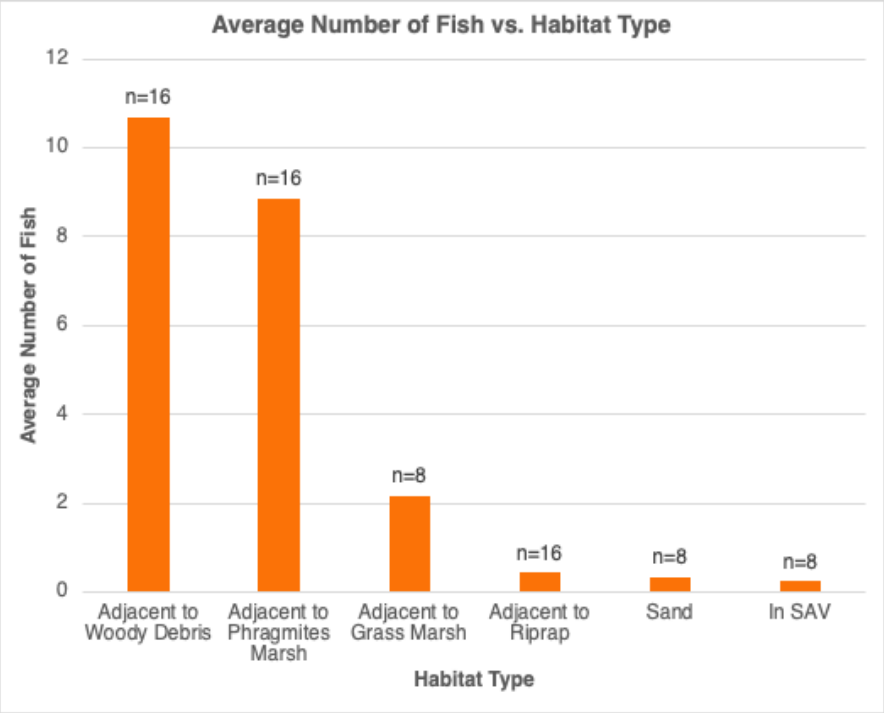
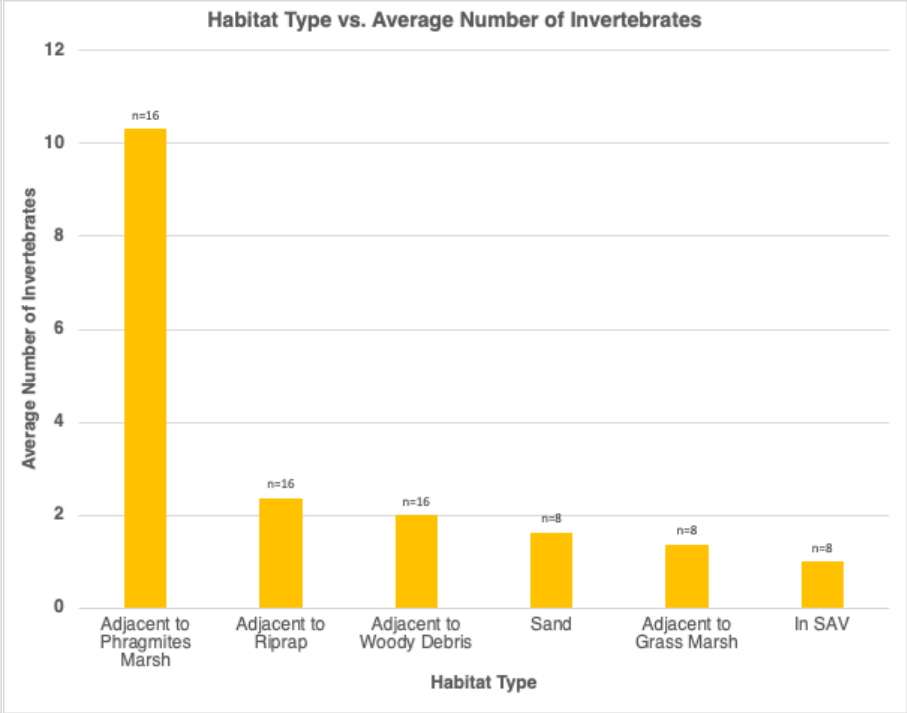
    - ✓ Water clarity
  - **Catch vs. Habitat type – Southern MD**

Site Catches





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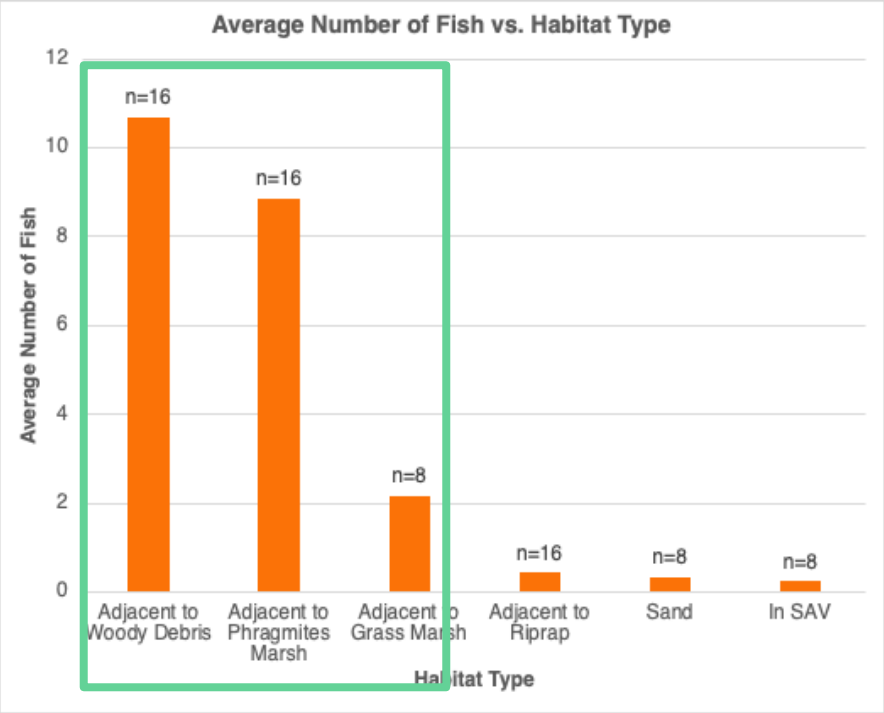

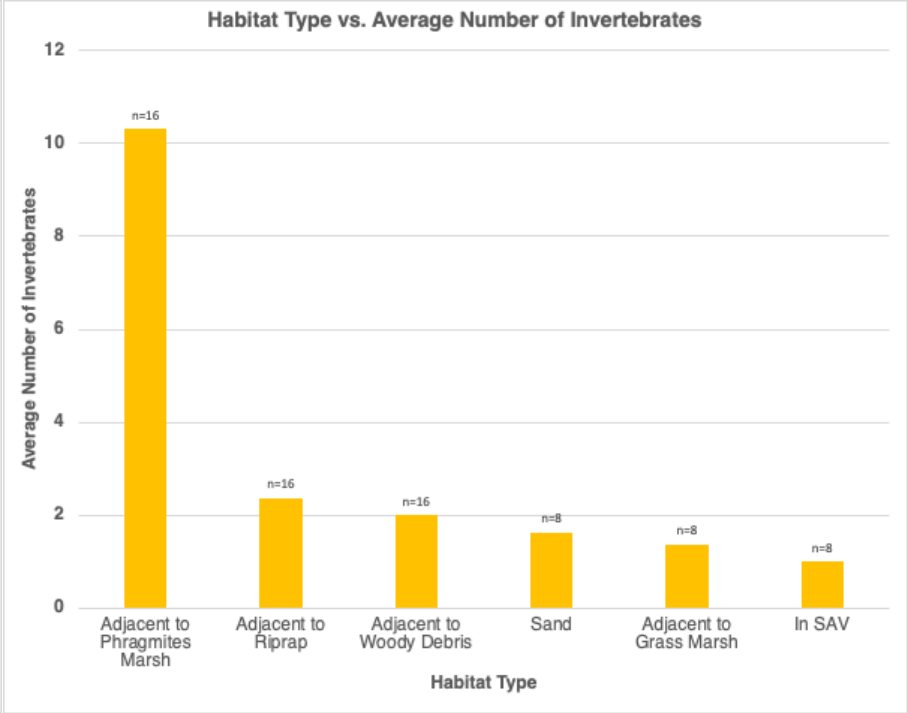

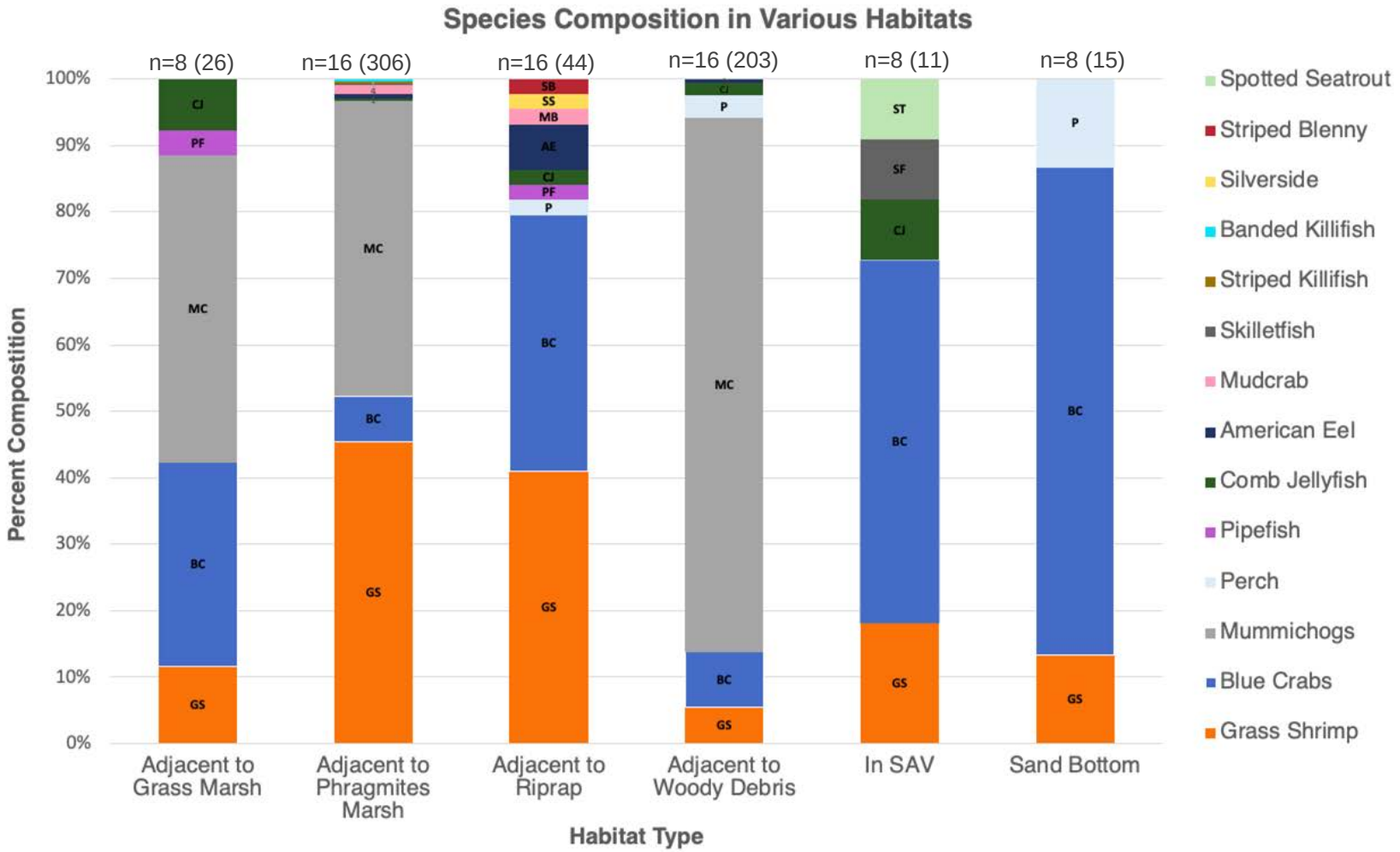
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Adjacent to Woody Debris
In SAV
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Habitat Type
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Silverside
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Comb Jellyfish
Pipefish
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Mummichogs
Blue Crabs
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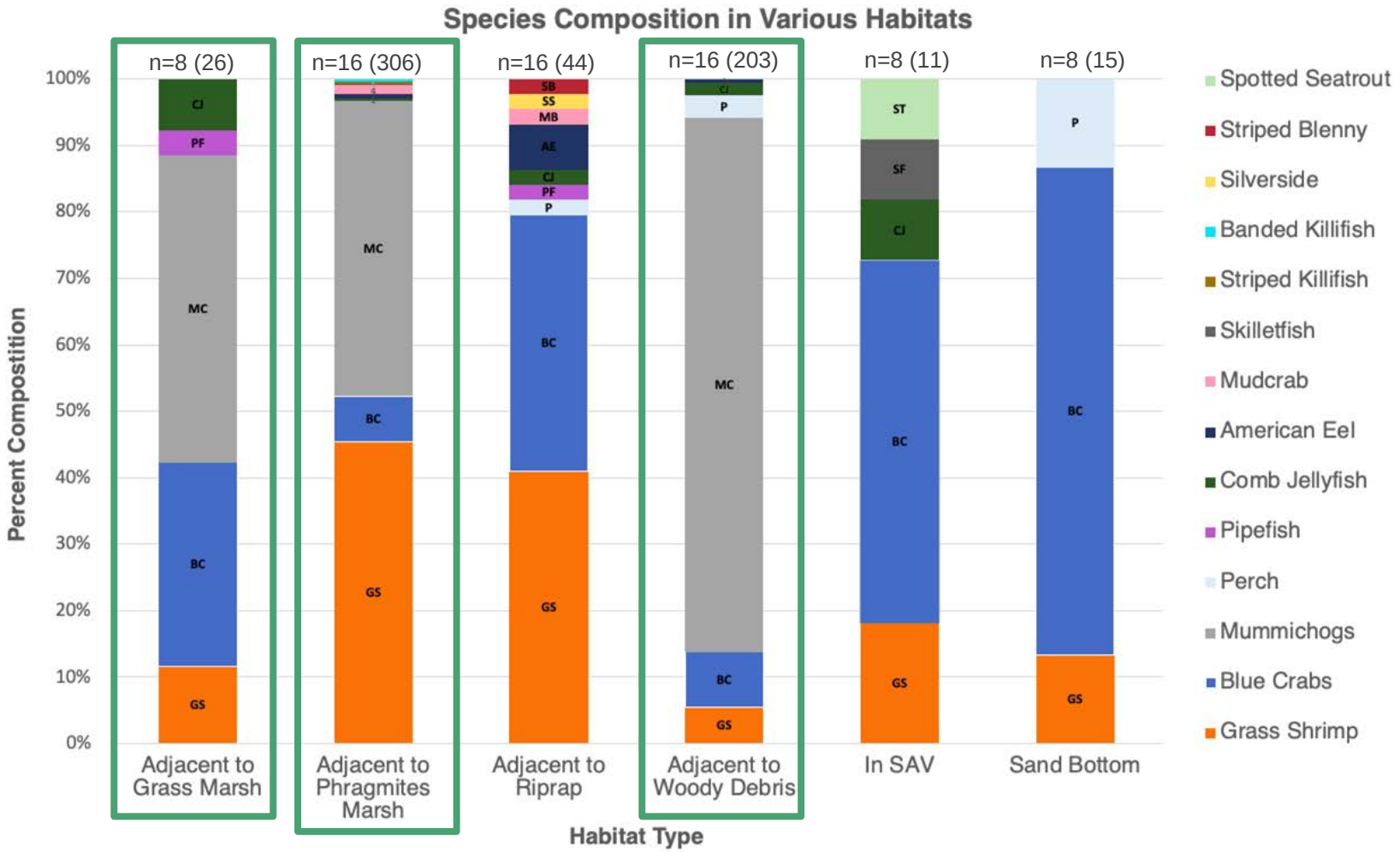
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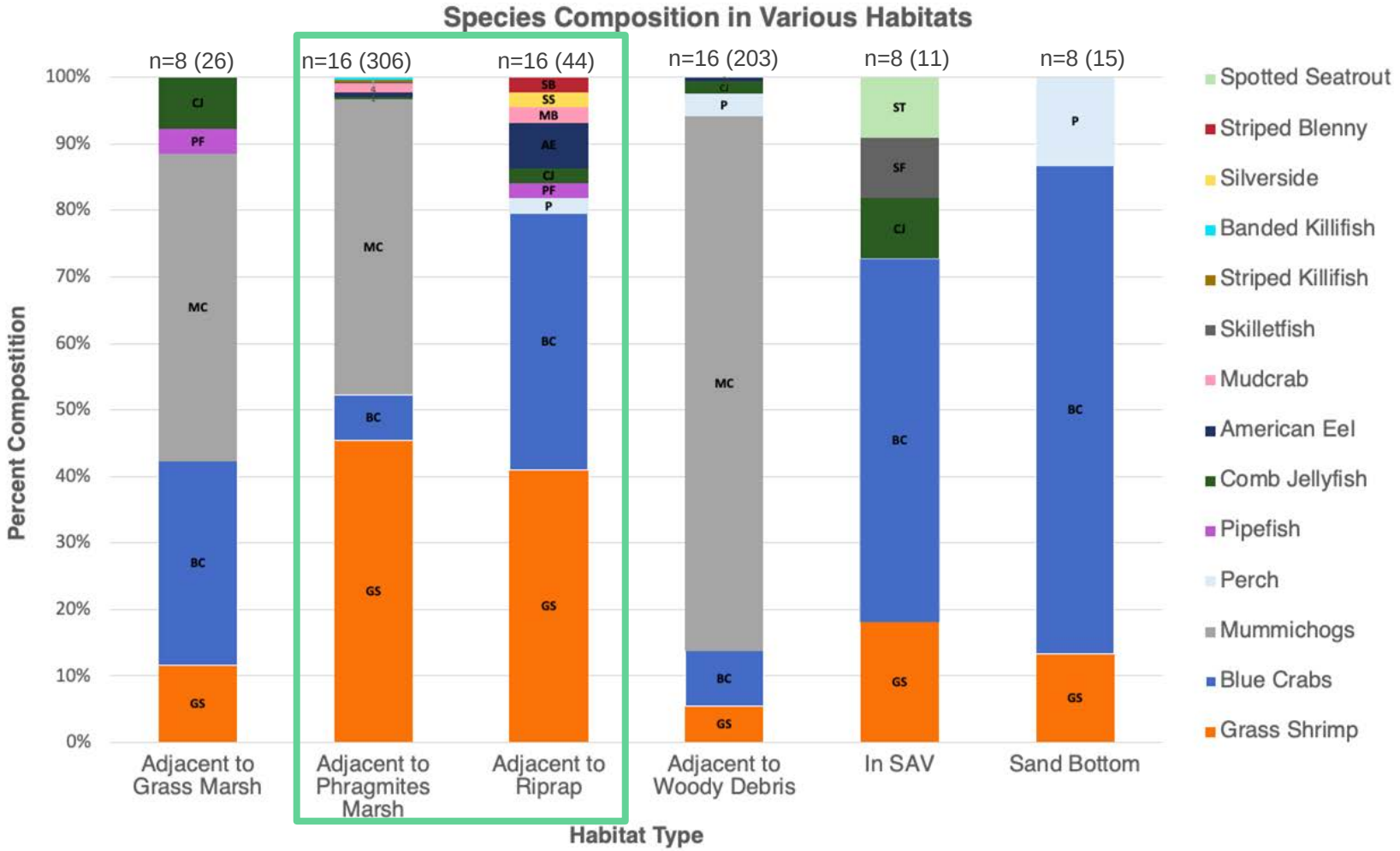
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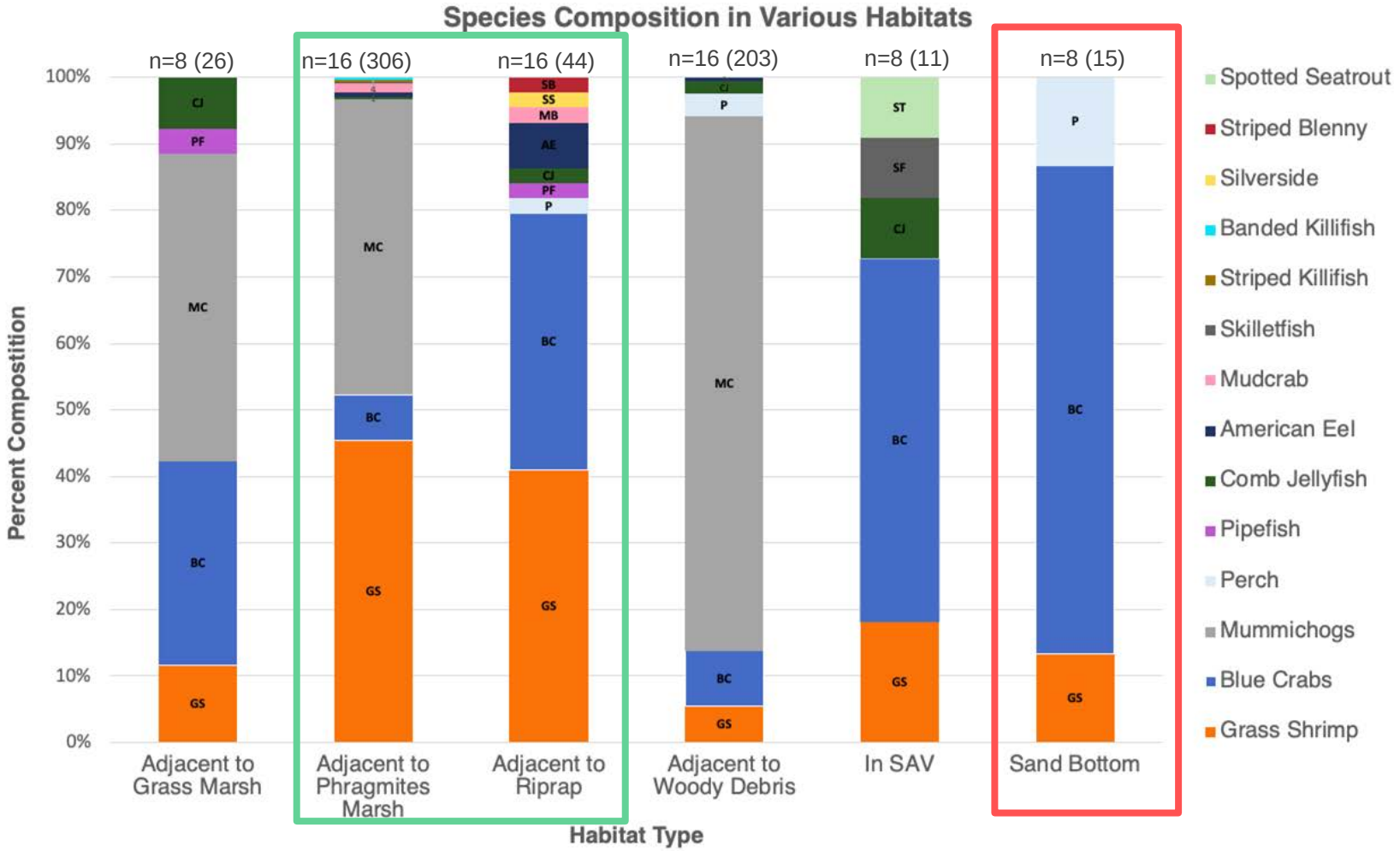
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Citizen Scientist Involvement

- Engaged three Maryland river groups
  - Severn River Association (previous partner)
  - Magothy River Association (new)
  - Friends of St. Leonard Creek (new)

Future Goals

- Fund to broaden network, acquire new regional datasets
- Engage more Citizen Science groups
- Acquire more data, enable regionally-specific analyses
  - Trap saturation
  - Regional effects from water quality and season
  - Species associations with habitat; by region
- Use results to inform fishery managers and identify priority habitat areas to protect/conserve

Extra Slides

Forage Species Data Collection & Public Involvement

Caroline Troy
Mentor: Dr. Tom Ihde
PEARL Internship 2019

Background

- Forage are small fish or invertebrates that are eaten by predator species
  - Invertebrates are of equal importance as forage as fish species (Ihde et al. 2015)
- Forage species are essential to bay health and support larger species
- There are very few studies of forage species that live in the shallow waters of the Chesapeake and their habitats

Blue Crab

White Perch

Mummichogs

Grass Shrimp

The main objective of this citizen science project is to address this gap in scientific data on forage.

In which habitats and in what compositions in these habitats are forage species living in the Bay?

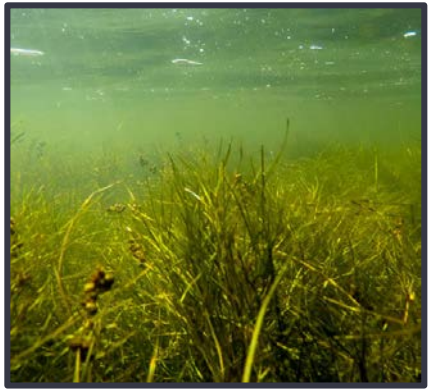
Objective

1. Collect data about forage species in varied habitats in the park

1. Analyze data to look for variations in species composition across different habitats and conditions

1. Involve local monitoring groups in the project to expand its reach and educate citizens

Riprap habitat



Submerged Aquatic Vegetation (SAV)

Marsh habitat

Woody debris habitat

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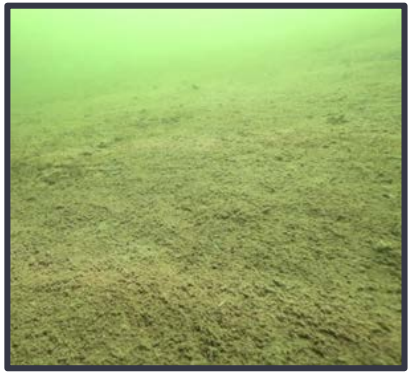
Phragmites habitat



Mud bottom habitat

Sand habitat

Bulkhead habitat

Acknowledgments

Many thanks to:

- Jefferson Patterson Park
  - Director Rachelle Green
- *Our community partners:*
  - Severn River Association
  - Magothy River Association
  - Friends of St. Leonard Creek
  - James River Association
- *My mentor:* Dr. Tom Ihde
- Richard Lacouture
- Kaitlynn Ritchie
- Dr. Scott Knoche
- *The interns who set traps with me:*
  - Kyle Wood
  - Sabrina Tolbert
  - Kat Neilson
- *And everyone else at PEARL!*