Forage Species Data Collection & Public Involvement

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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

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

3. 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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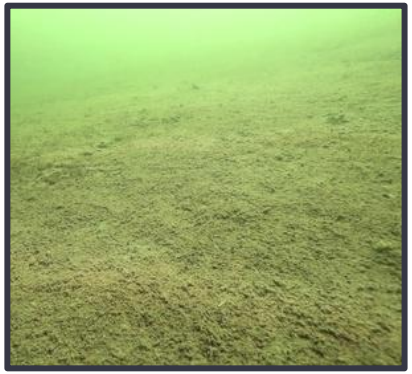
Phragmites habitat

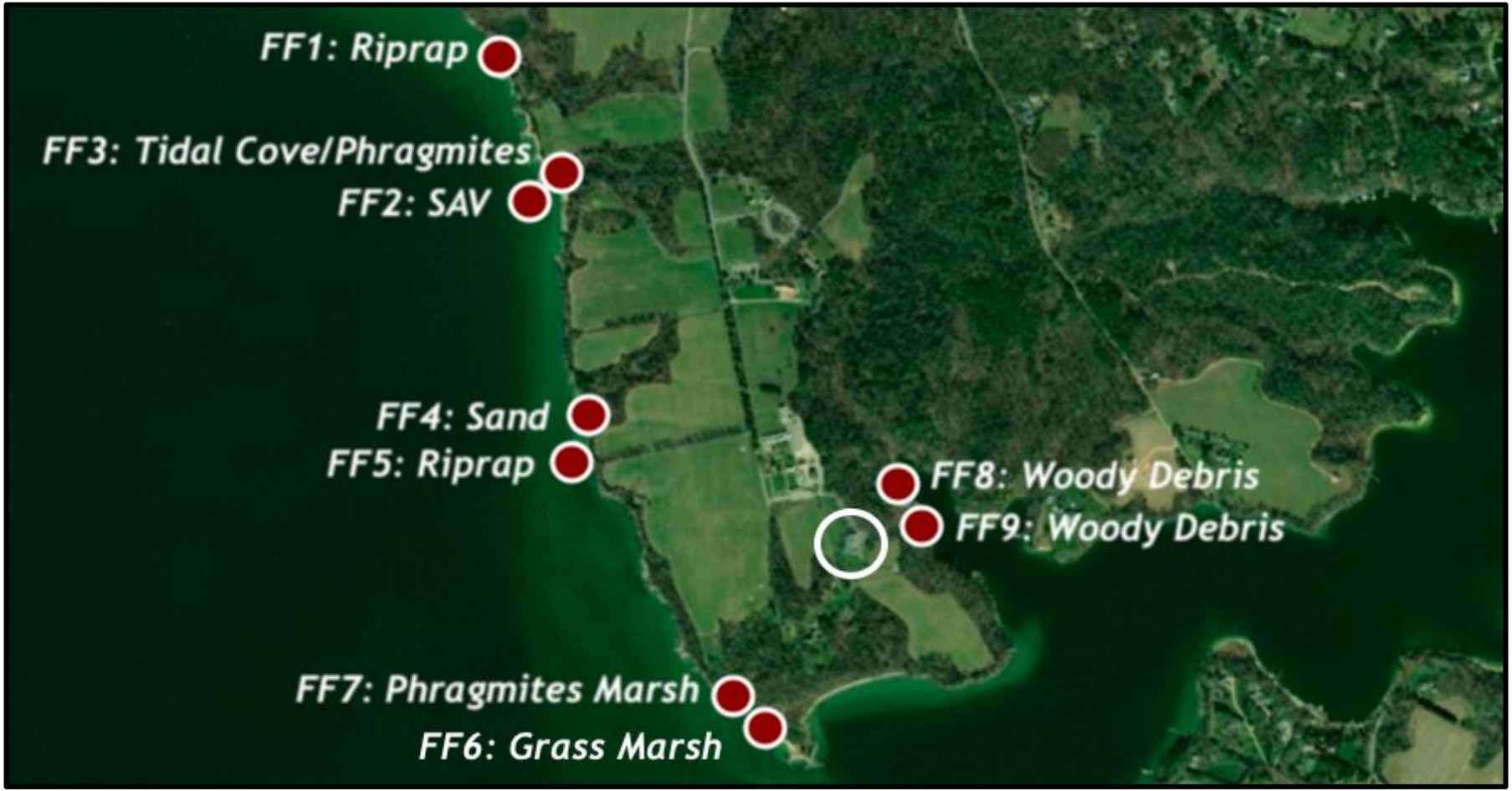


Mud bottom habitat

Sand habitat

Bulkhead habitat

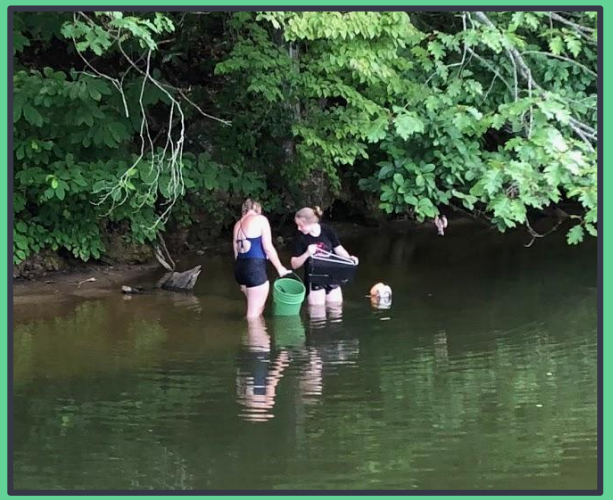
Sampling: Sites



Sampling: Sites

FF7: Phragmites Marsh

FF2: SAV Habitat



FF8: Woody Debris Habitat

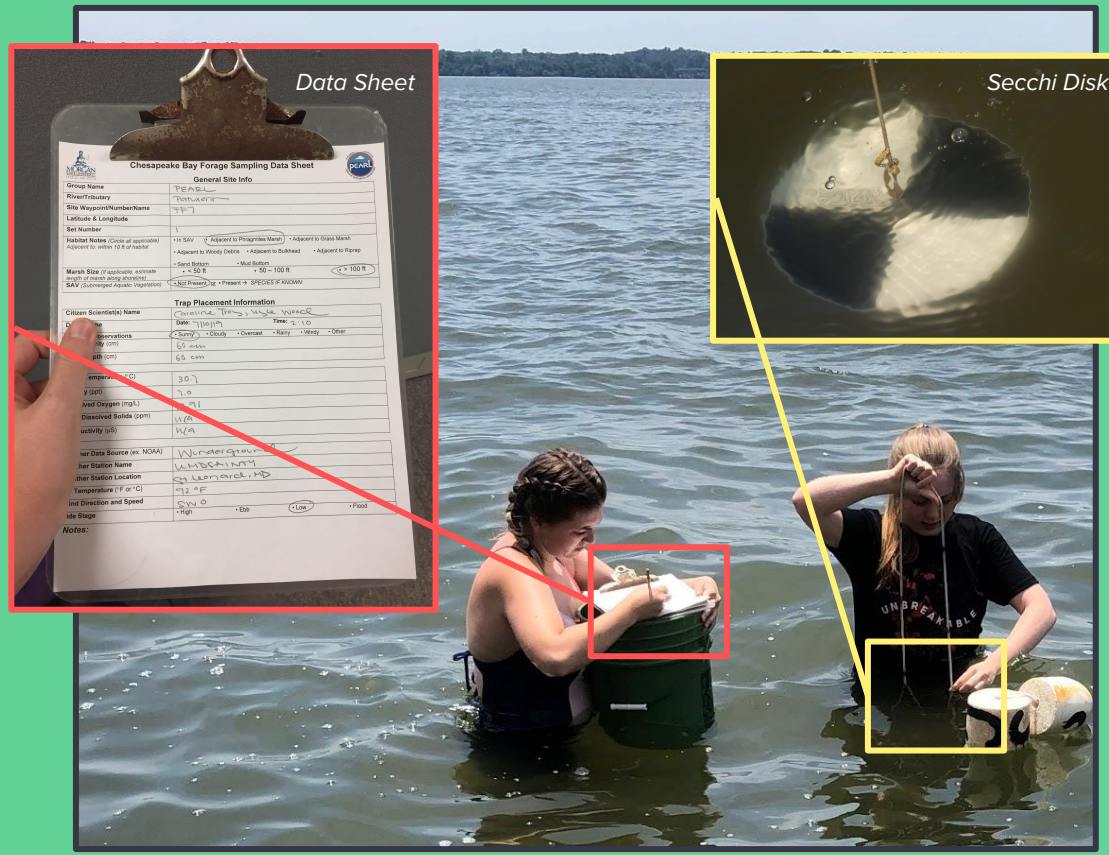
FF9: Woody Debris Habitat

FF4: Sand 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

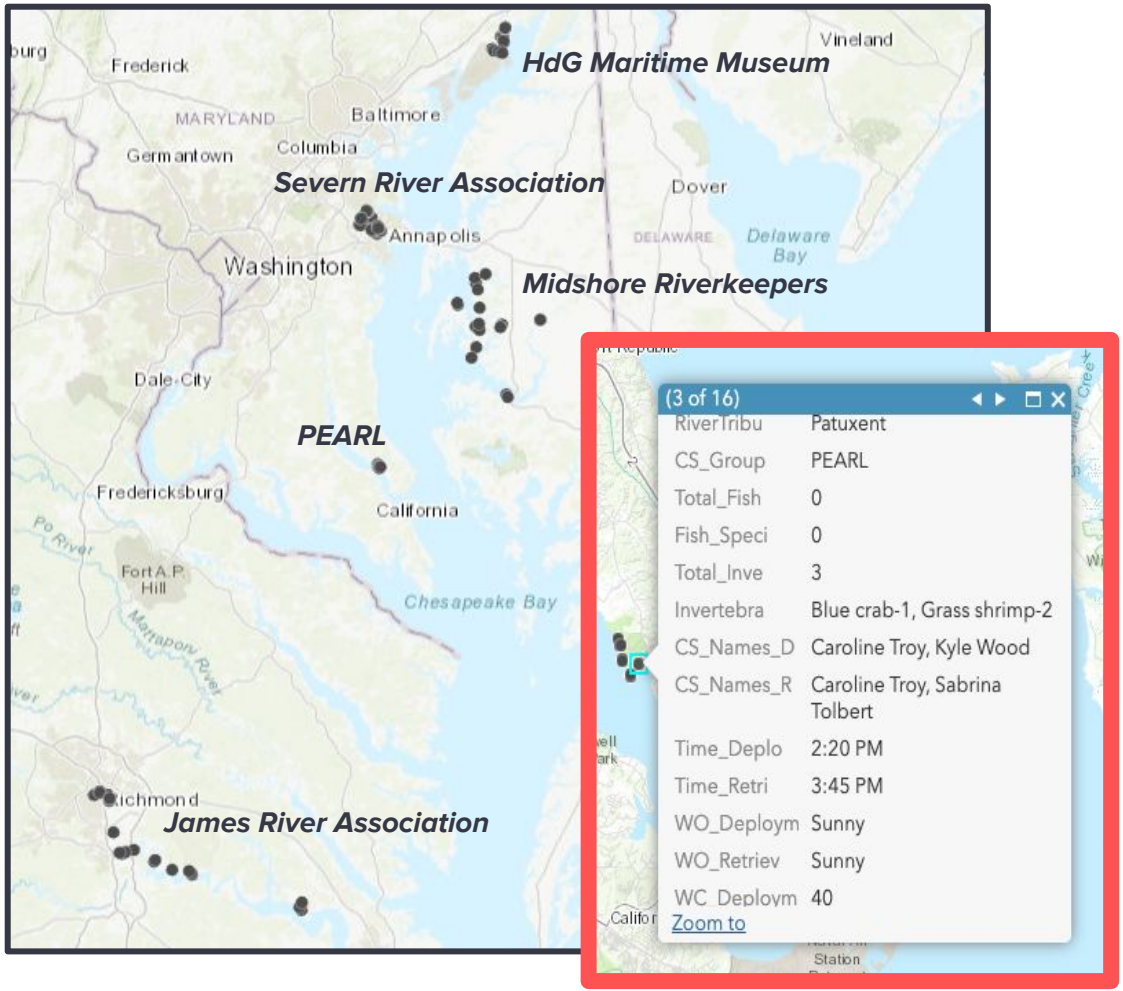
American Eel

Spotted Seatrout

Data Compilation

1. Logged around 300 observations from five datasets since project start in 2017 into a spreadsheet

2. With help from Kaitlynn Ritchie, we used the Lat. & Long. locations to represent this data on a GIS map



Preliminary Data Analysis

- Using both my data, and all the data previously collected, I made graphs of:
  - **The number of invertebrates and fish versus:**
    - Duration of trap set
    - Water quality parameters
      - Water temperature
      - Salinity
      - Dissolved oxygen
      - % Water clarity
    - Habitat type
    - Time

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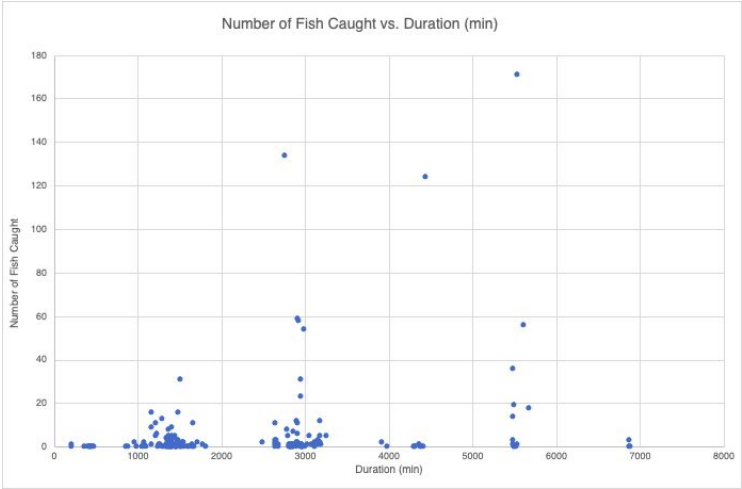

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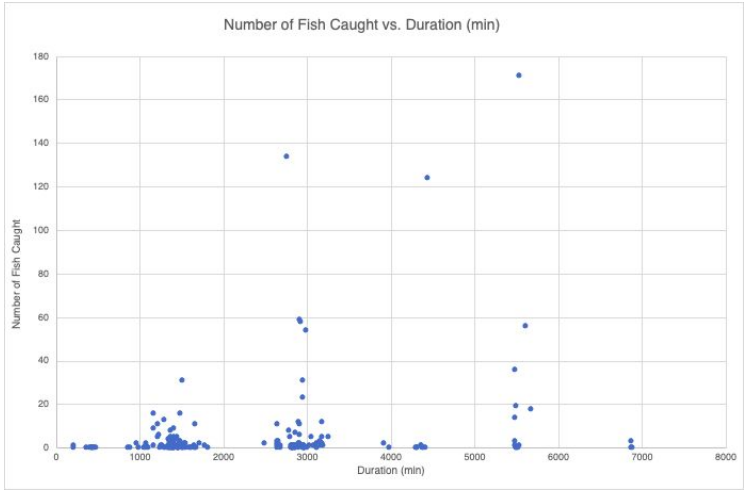
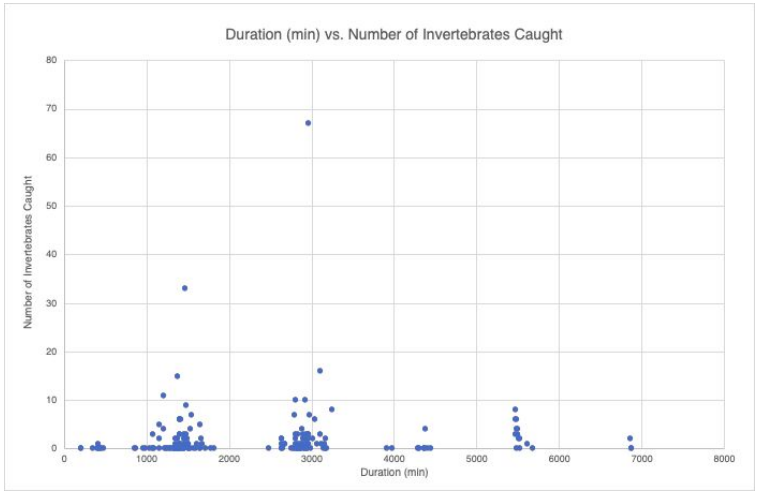
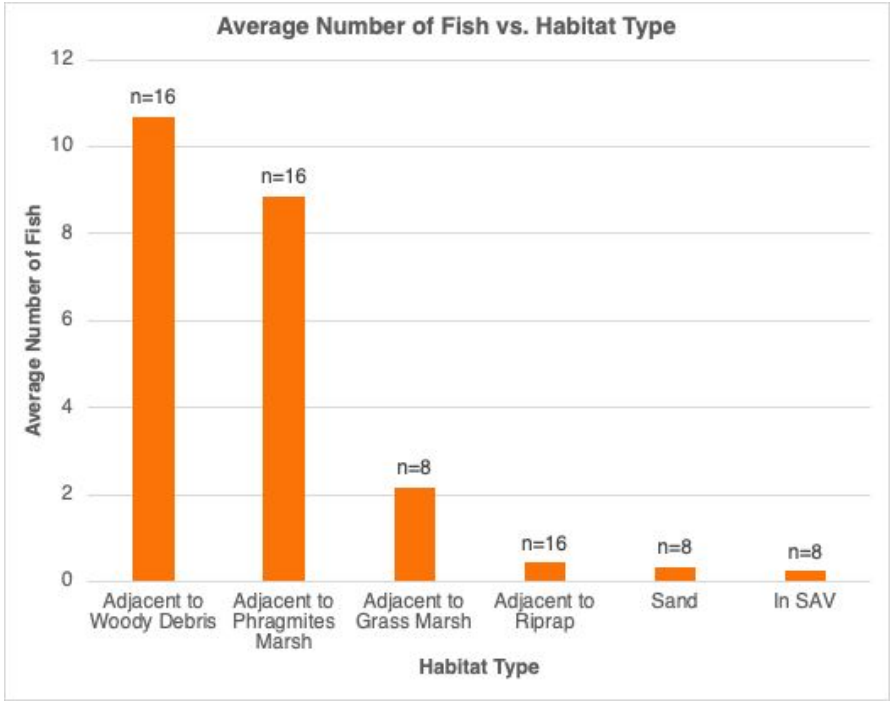
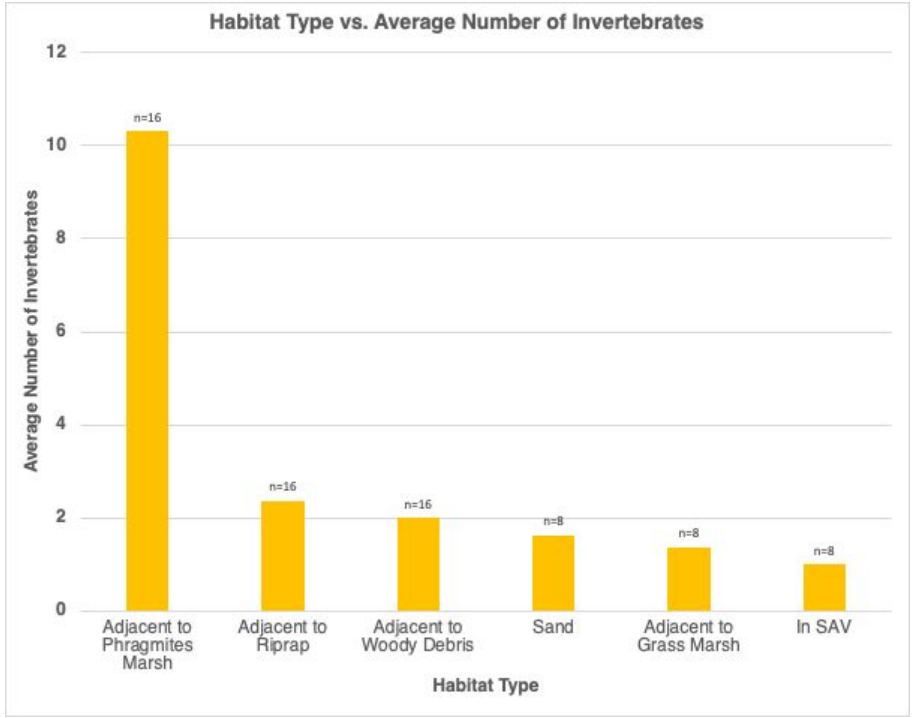




Site Catches





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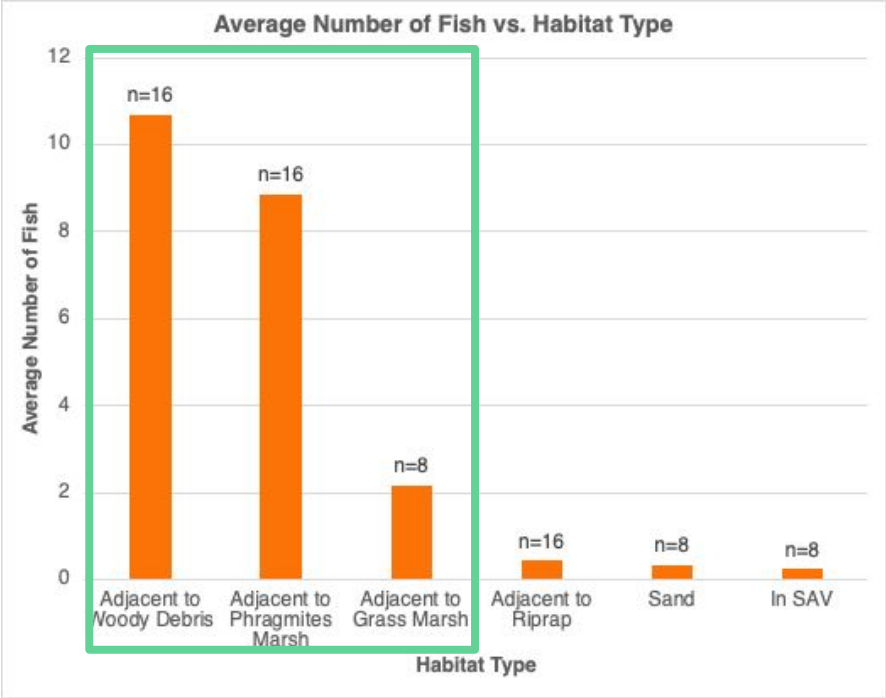
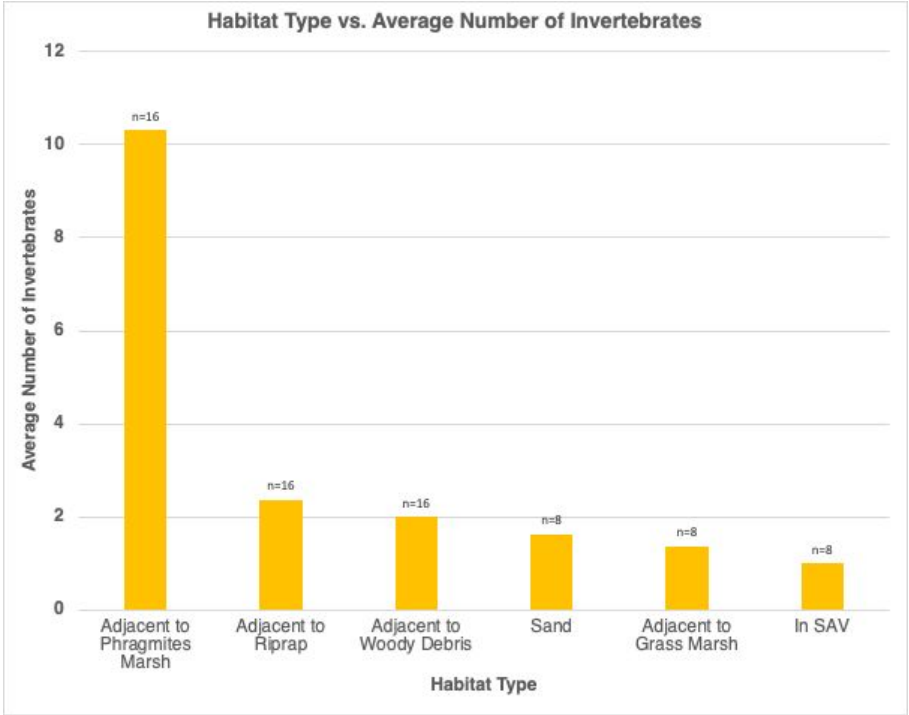
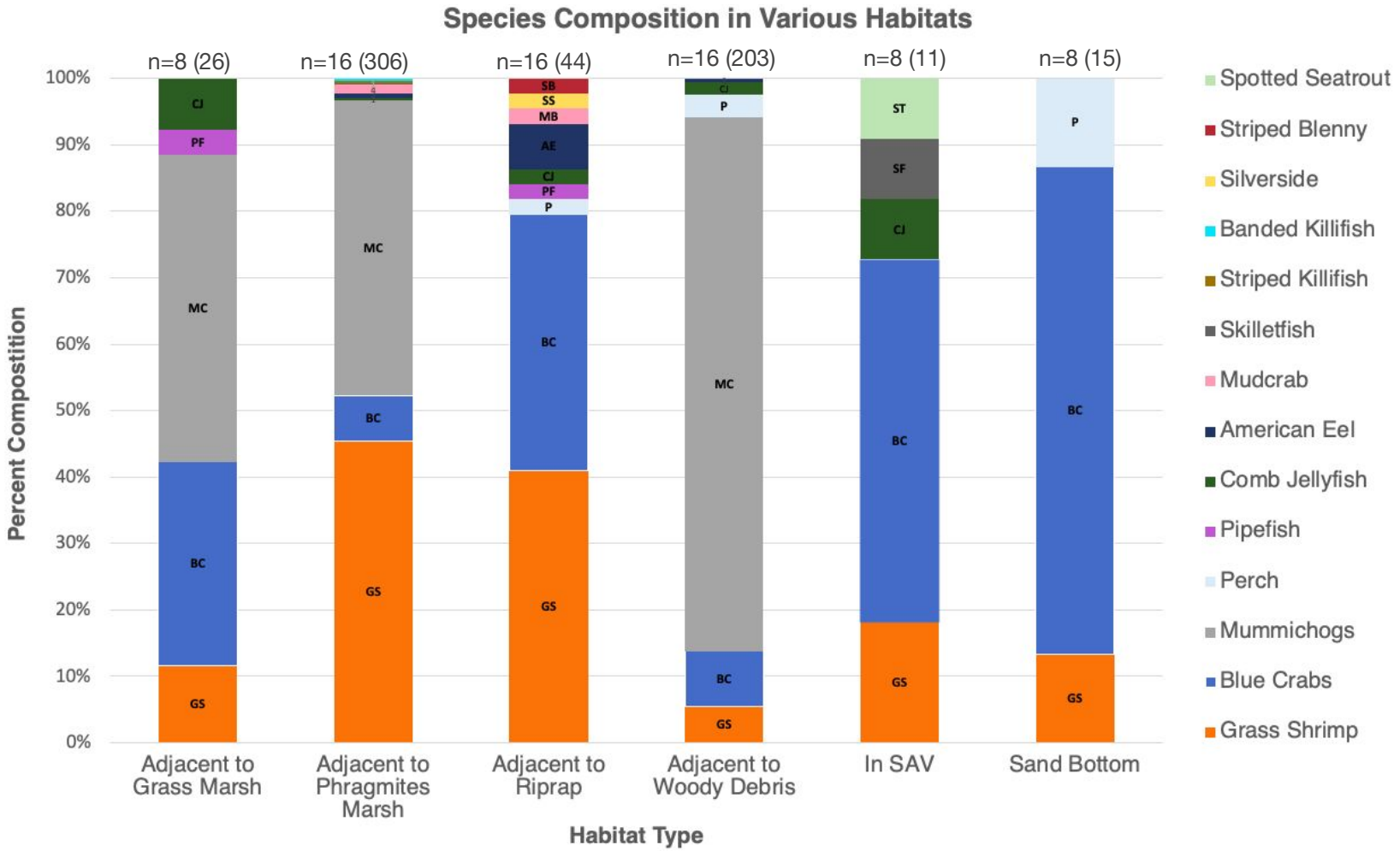




- Crum et al. 2016


Species Composition in Various Habitats
n=8 (26)
n=16 (306)
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Habitat Type
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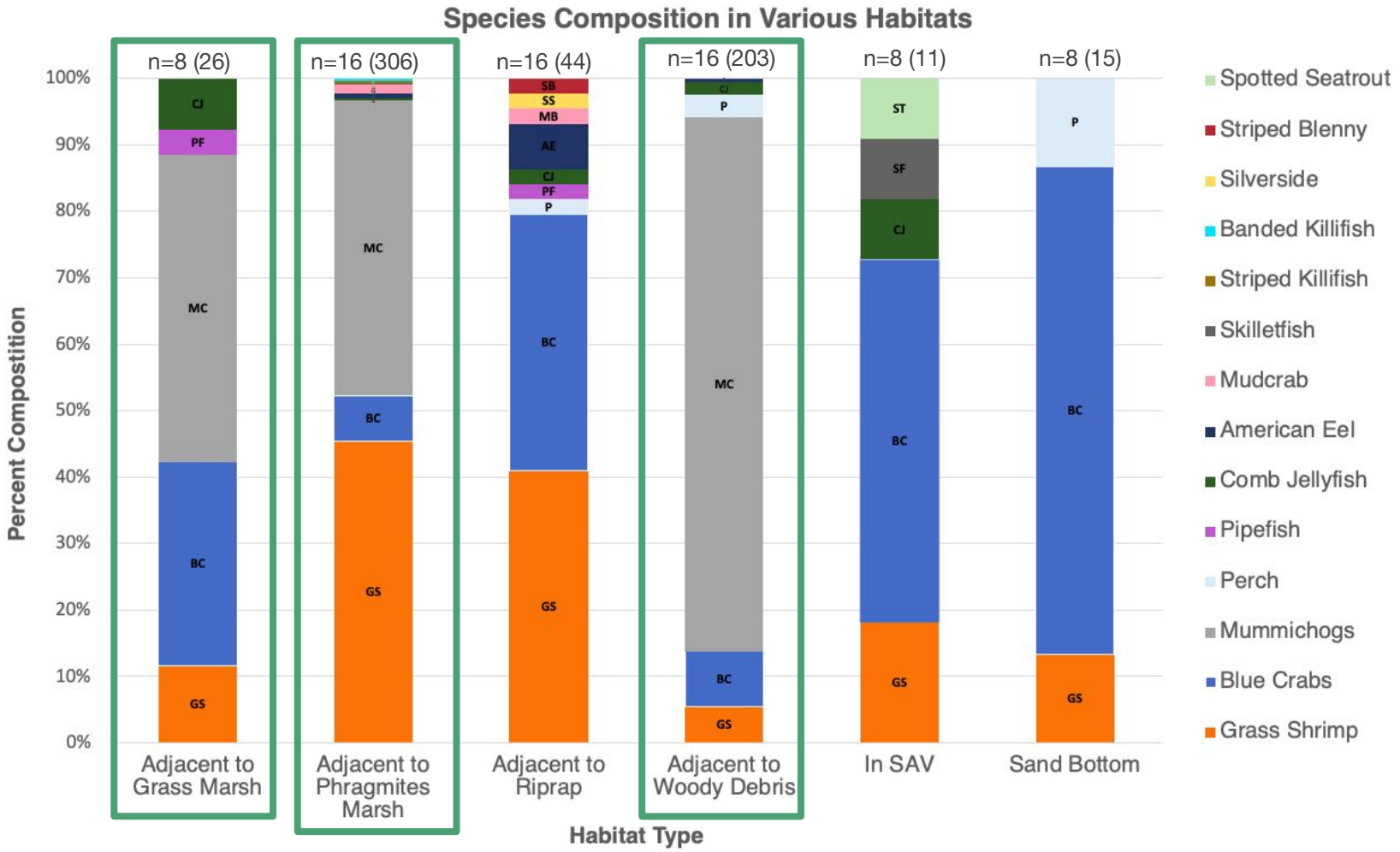
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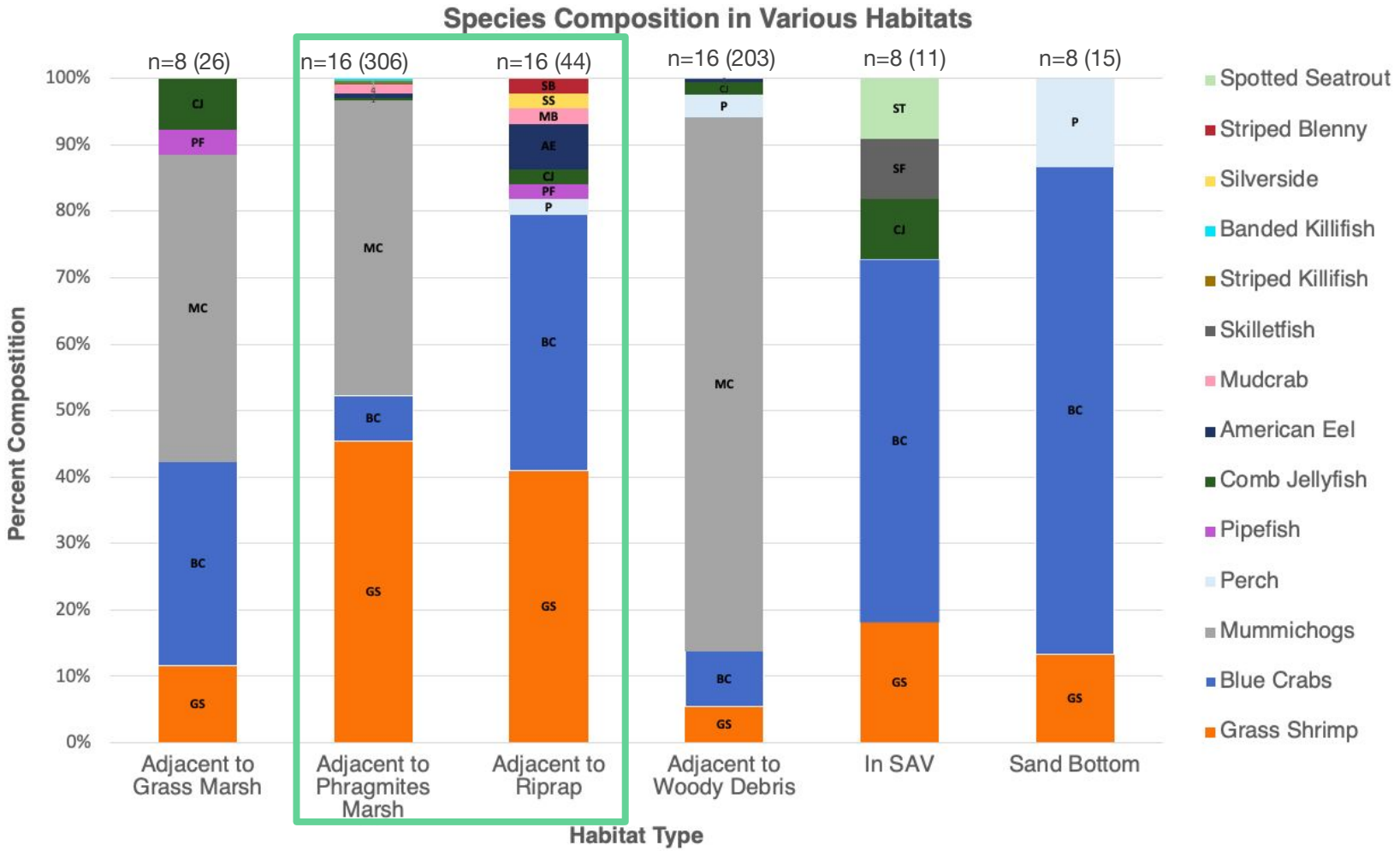
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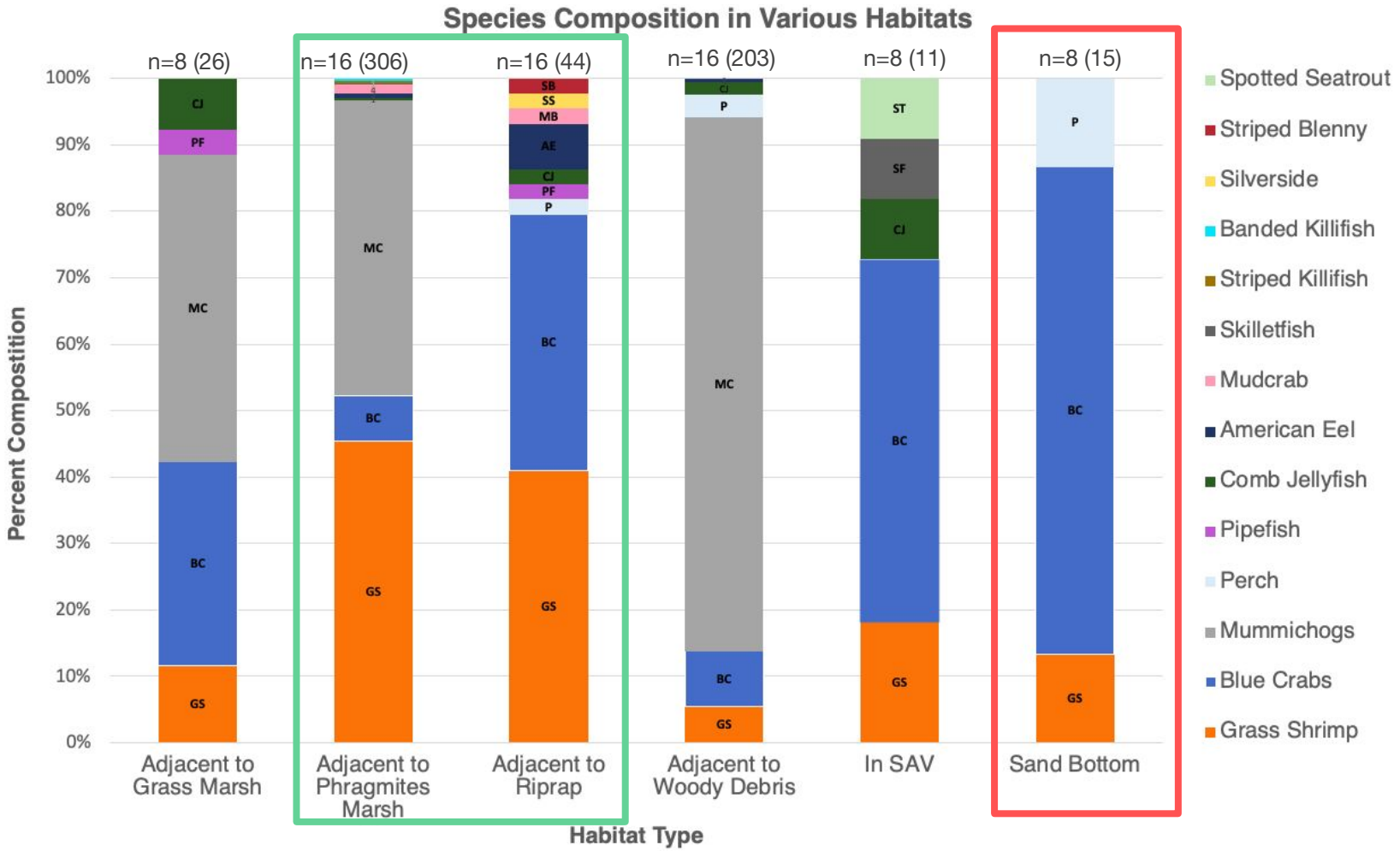
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Citizen Scientist Involvement

- Reached out to three Maryland river groups
  - Severn River Association
  - Magothy River Association
  - Friends of St. Leonard Creek

Goals for the Future

- Work with more Chesapeake groups
- Apply for grants to purchase more materials to give to groups
- Complete more extensive analysis
  - Duration
  - Determine effects from water quality or season
  - Break data down by species
- Use results to inform fishery managers, inform policy, and protect essential 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!*