Characterization of nursery habitats used by black sea bass and summer flounder in Chesapeake Bay and the coastal lagoons

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Acknowledgments

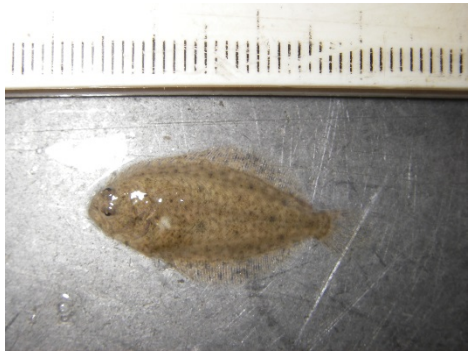
Special thanks to: Chris Walstrum, MD DNR - Summer Trawl Survey data
Angel Willey, MD DNR - MD Coastal Bays Trawl Survey data
Ron Sopko
Oyster Company of Virginia

Funded through NOAA Chesapeake Bay Office: Grant Number NA18NMF4570254

Need

- Coastal habitats are increasingly impacted by human activities
- These same habitats serve as nurseries for juvenile fishes
- However, we lack detailed understanding of specific habitat relationships for many juvenile fishes
- This knowledge gap makes evaluating proposed management actions difficult

Objectives

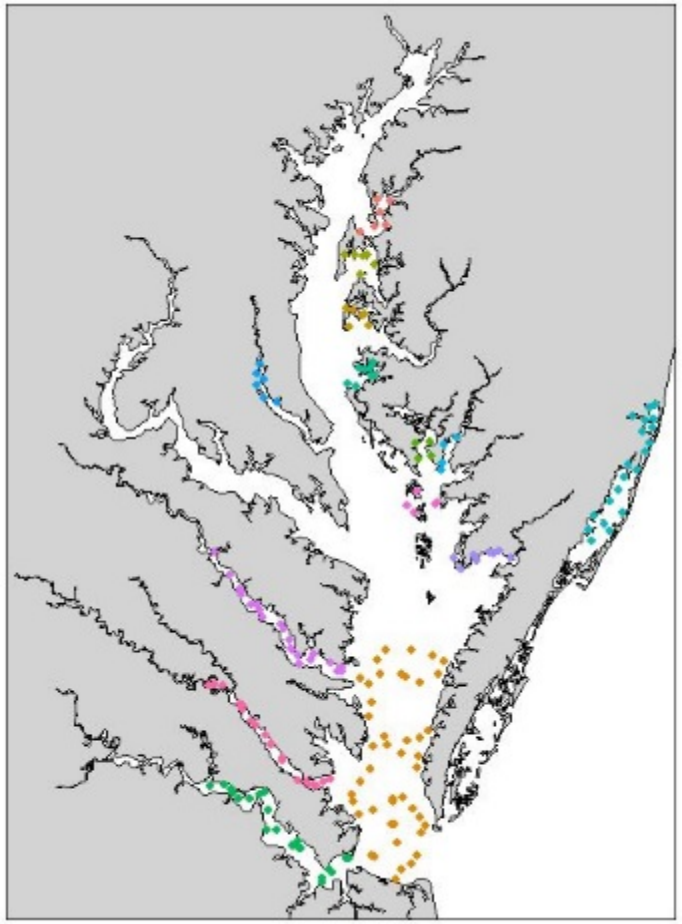


1. Delineate nursery habitats used by black sea bass and summer flounder in Chesapeake Bay and the coastal lagoons

2. Identify the relationship between habitat conditions in nursery areas and annual recruitment of black sea bass and summer flounder (1989 to 2018)

3. Evaluate the quality of specific habitat types in seaside and bayside nursery areas used by black sea bass and summer flounder

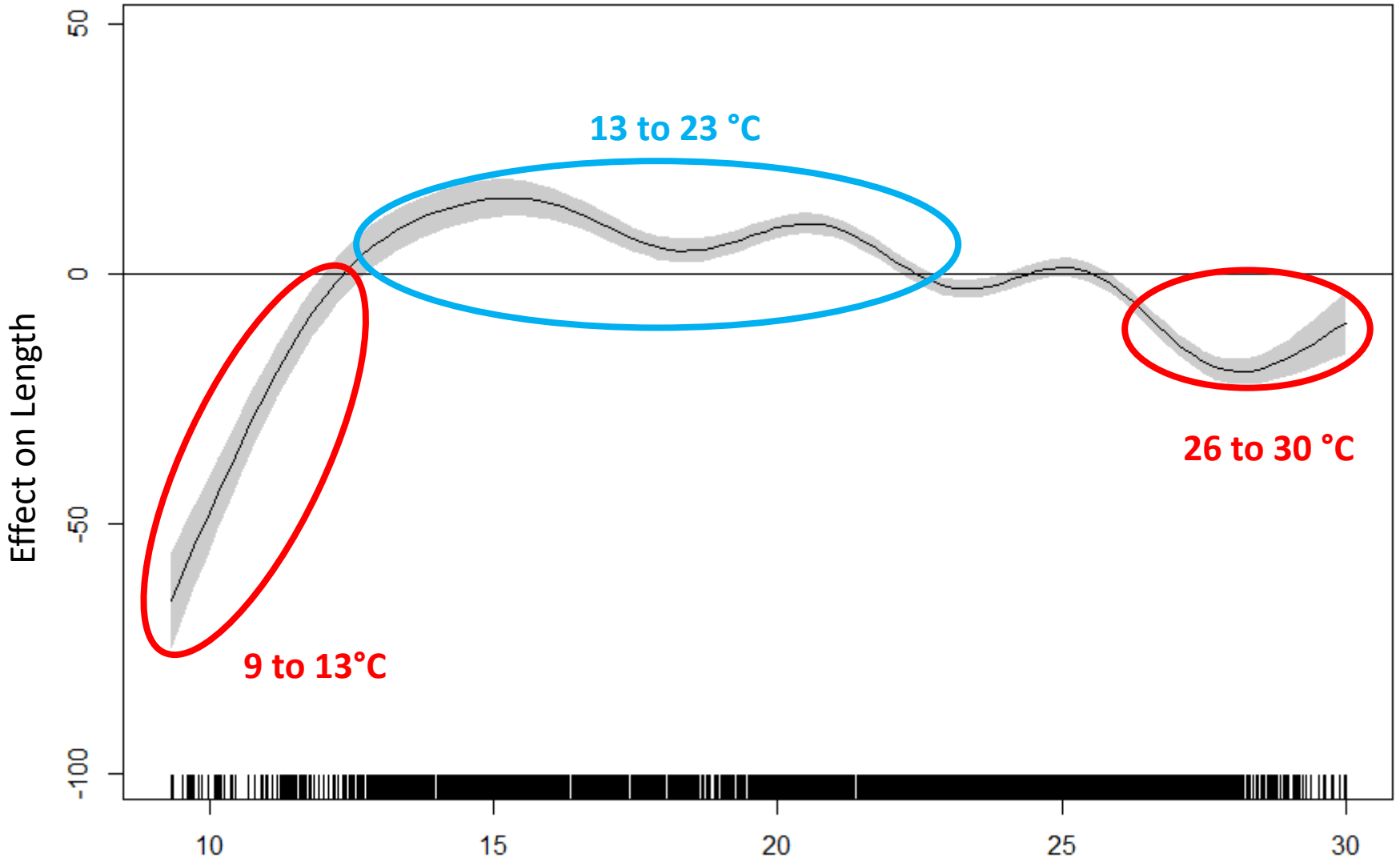
Methods – Objective 1
Delineate habitats



Locations of trawling sites in Chesapeake Bay and the coastal lagoons in MD and VA

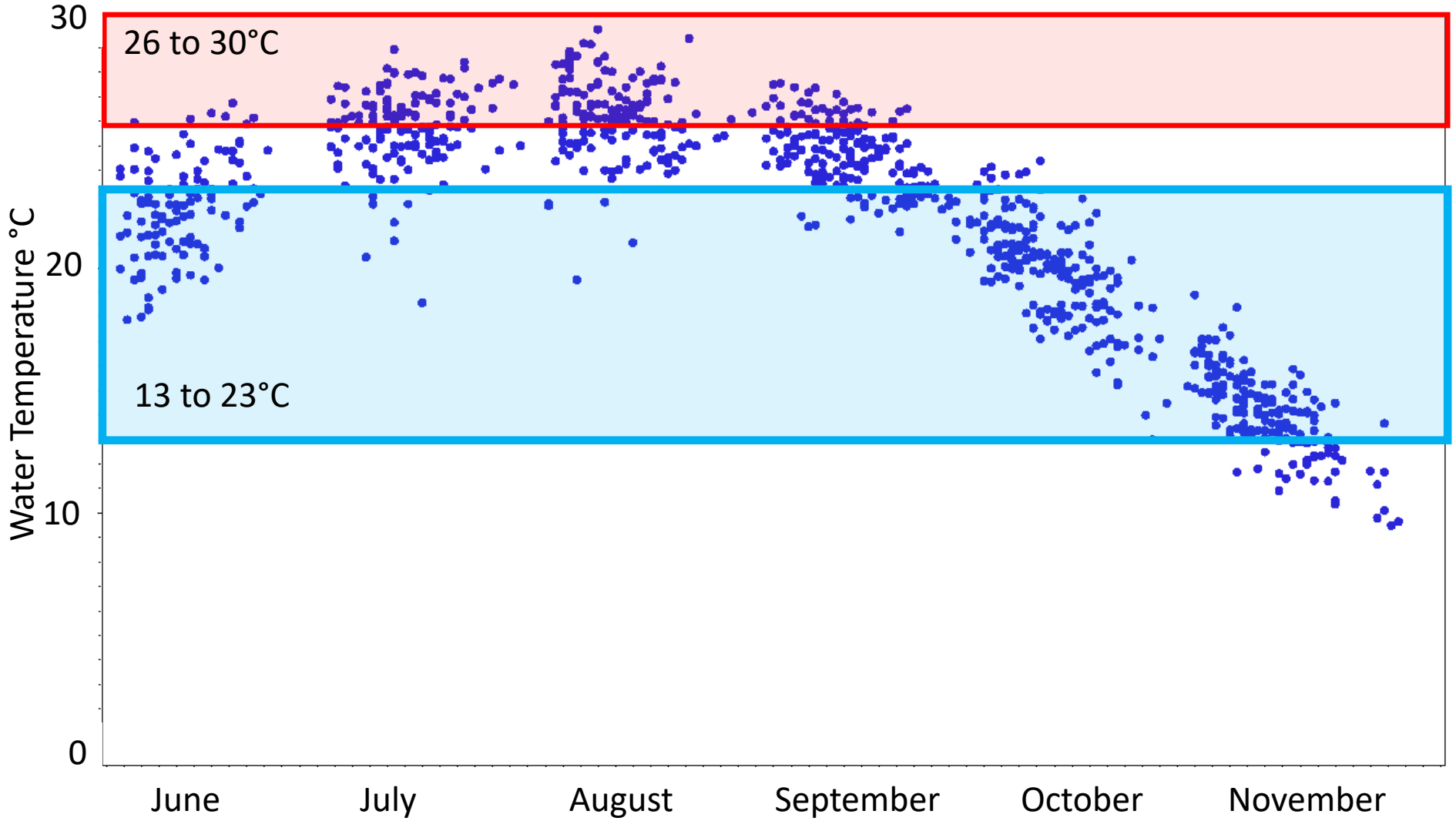
- Juvenile fish catch and size from trawl surveys
- Dynamic environmental conditions
  (e.g., temperature, salinity, DO)
- Proximity to structured habitats
  (e.g., marsh, oyster reef, seagrass)
- Generalized additive models

Summer flounder in Chesapeake Bay (1988 to 2012)



From Nys et al. 2015

Mean Temperature by Date (1988 to 2012) where Summer flounder were captured in CB



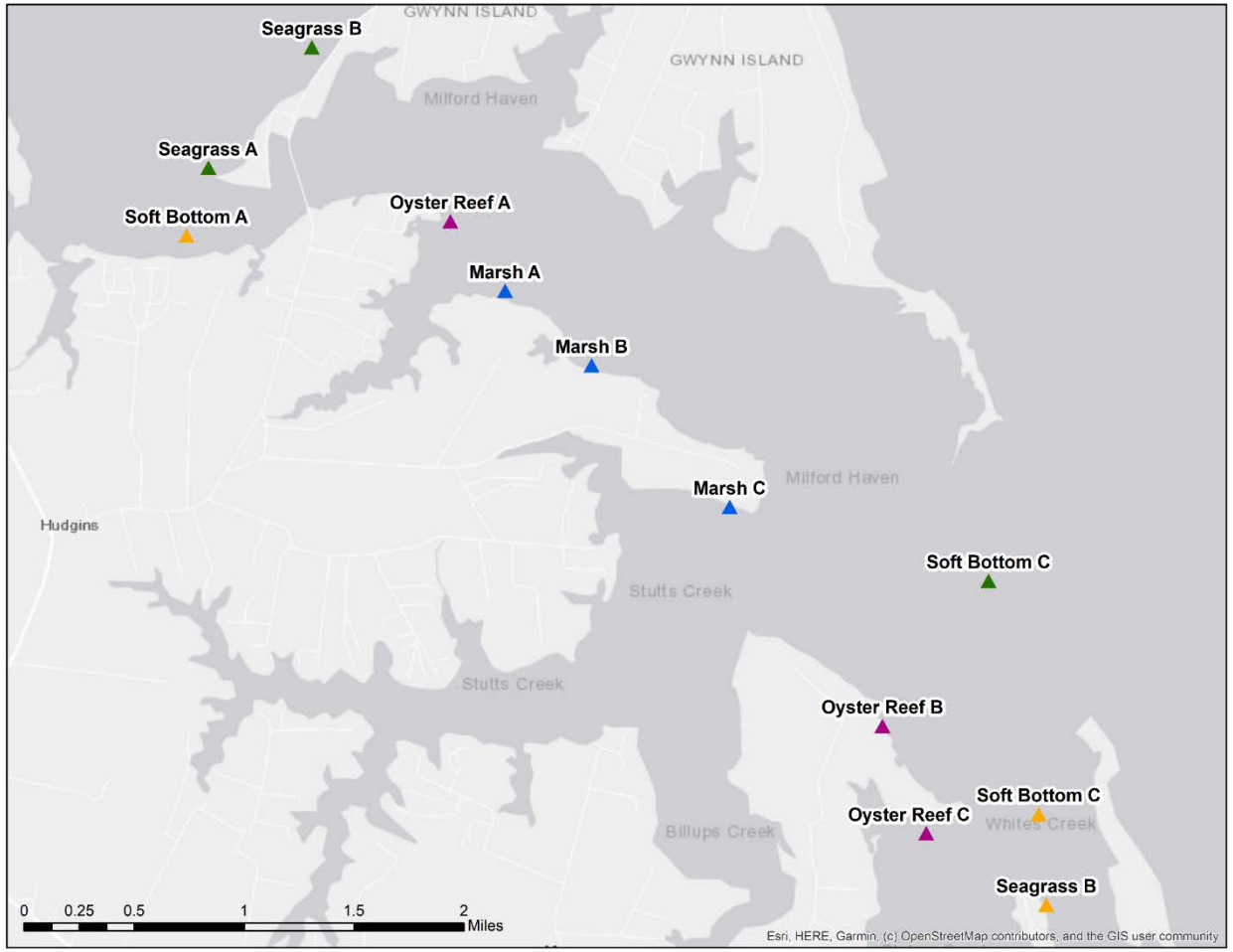
From Nys et al. 2015

Methods – Objective 2
Assess habitat conditions and Annual recruitment

- Use habitat features from Objective 1
- Annual time series of abundance
- Index of upwelling (Wang, VIMS)
- Proportion of suitable habitat and upwelling to annual juvenile abundance
- Develop a bay-wide estimate of recruitment using the Conn method (2010)

VIMS Trawl Survey

Methods – Objective 3
Evaluate quality of habitat types



- Bay habitats -Piankatank River
- Seaside lagoons- Oyster, VA
- Marsh
- Seagrass
- Oyster reef
- Soft bottom

Use fish condition and recent growth as a metric of habitat quality

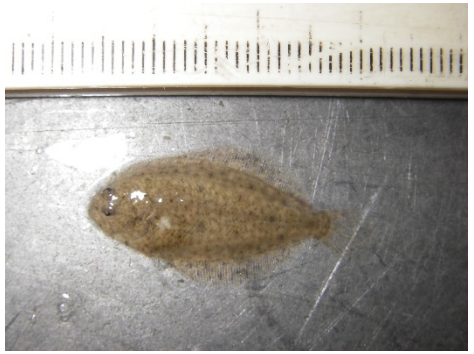
Methods – Objective 3 continued
Evaluate quality of specific habitat types

- Two gear types – SMURF, fyke nets
- Four habitats, with replication
- April to September, 2019/2020

SMURF – standard monitoring unit for recruitment of reef fish

Fyke net

Preliminary results



Gear	Species	Piankatank River	Oyster, VA
SMURF	Black sea bass	2	16
	Summer flounder	0	0
Fyke net	Black sea bass	0	13
	Summer flounder	5	4

Questions?

Creative oyster habitat