Fish Assemblage of the Raritan River Thalweg

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Driver

- Assess fish assemblage to understand natural changes and anthropogenic impacts
- Targeted especially towards Young-of-the-year (YOY) recruiting fish
  - Because nursery function is important
  - Because YOY dynamics are temporally closest to impacts
  - Complements ongoing shoreline surveys

Methods

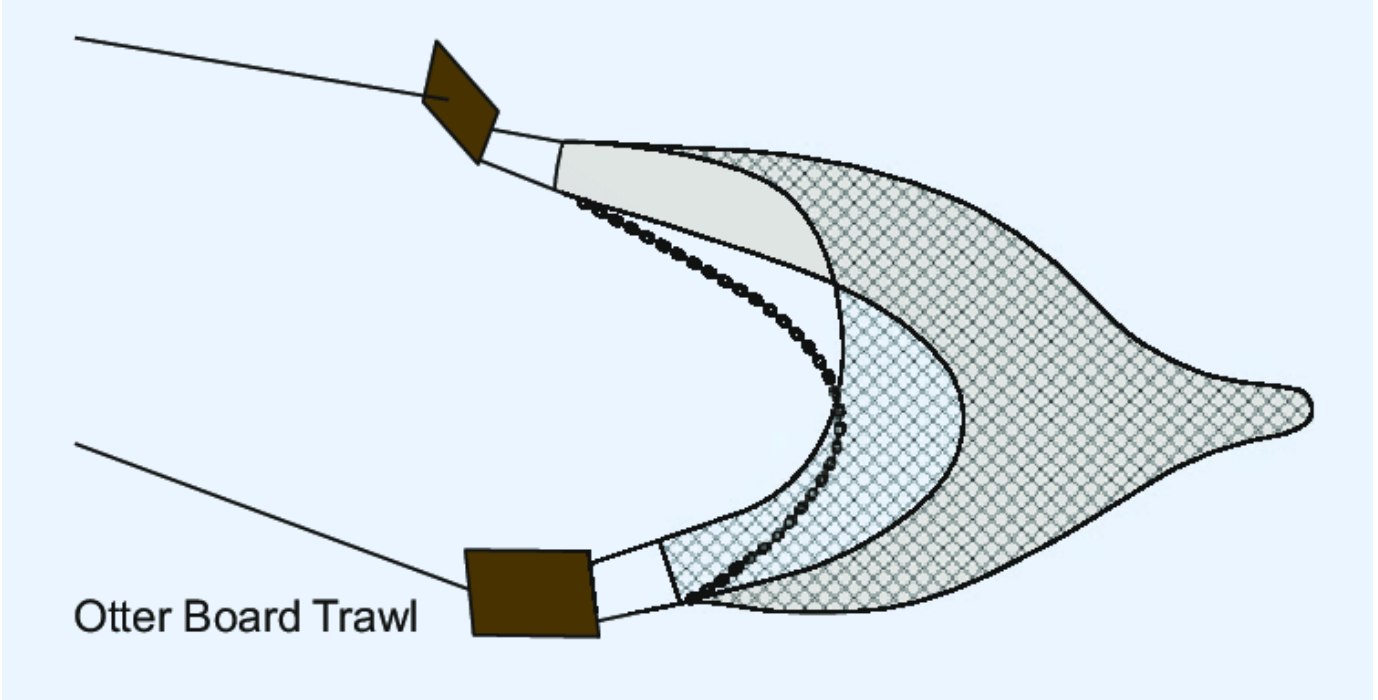
- Catch fish by otter trawl
- Seasonally and along salinity gradient
- Identify species
- Count (expressed as CPUE by m^2)
- Measure and weigh
  - Identify cohorts
  - Calculate survivor growth from modal progression
- Quantify Spatial and Temporal Dynamics

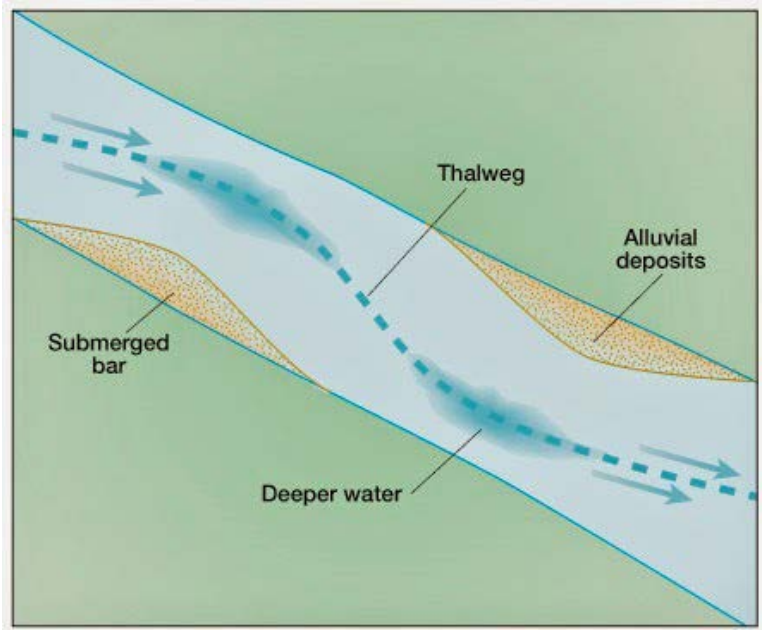
Otter trawl

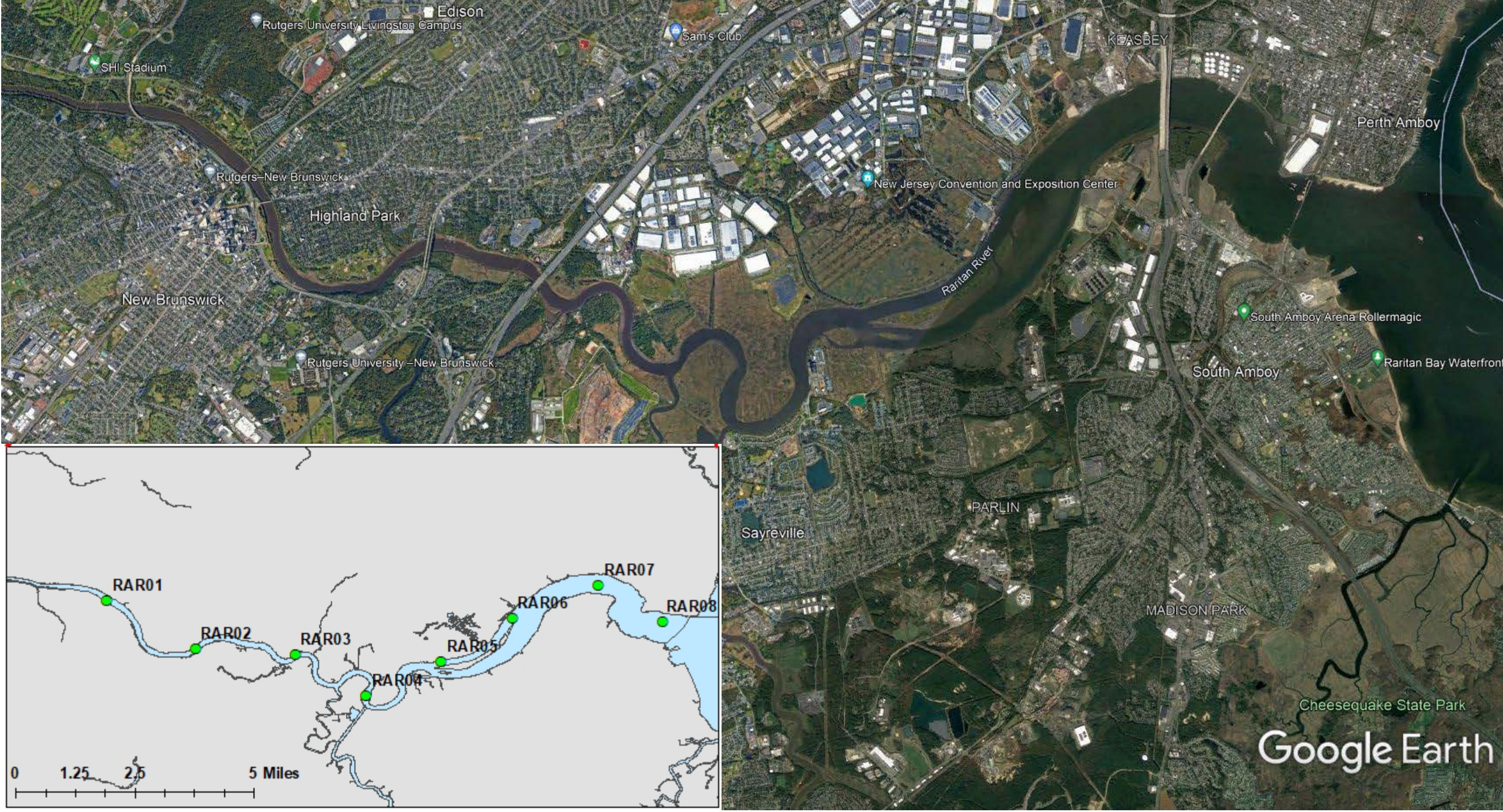
- 4.9 m headrope, 19 mm mesh wings, 6.3 mm mesh codend liner
- Towed from skiff at ~ 2 knots
- Into current
- Tow Scope of 5 x water depth
- 2 minutes per tow
- 3 tows per station are psuedoreplicates and are combined per season/station

Appropriate to:

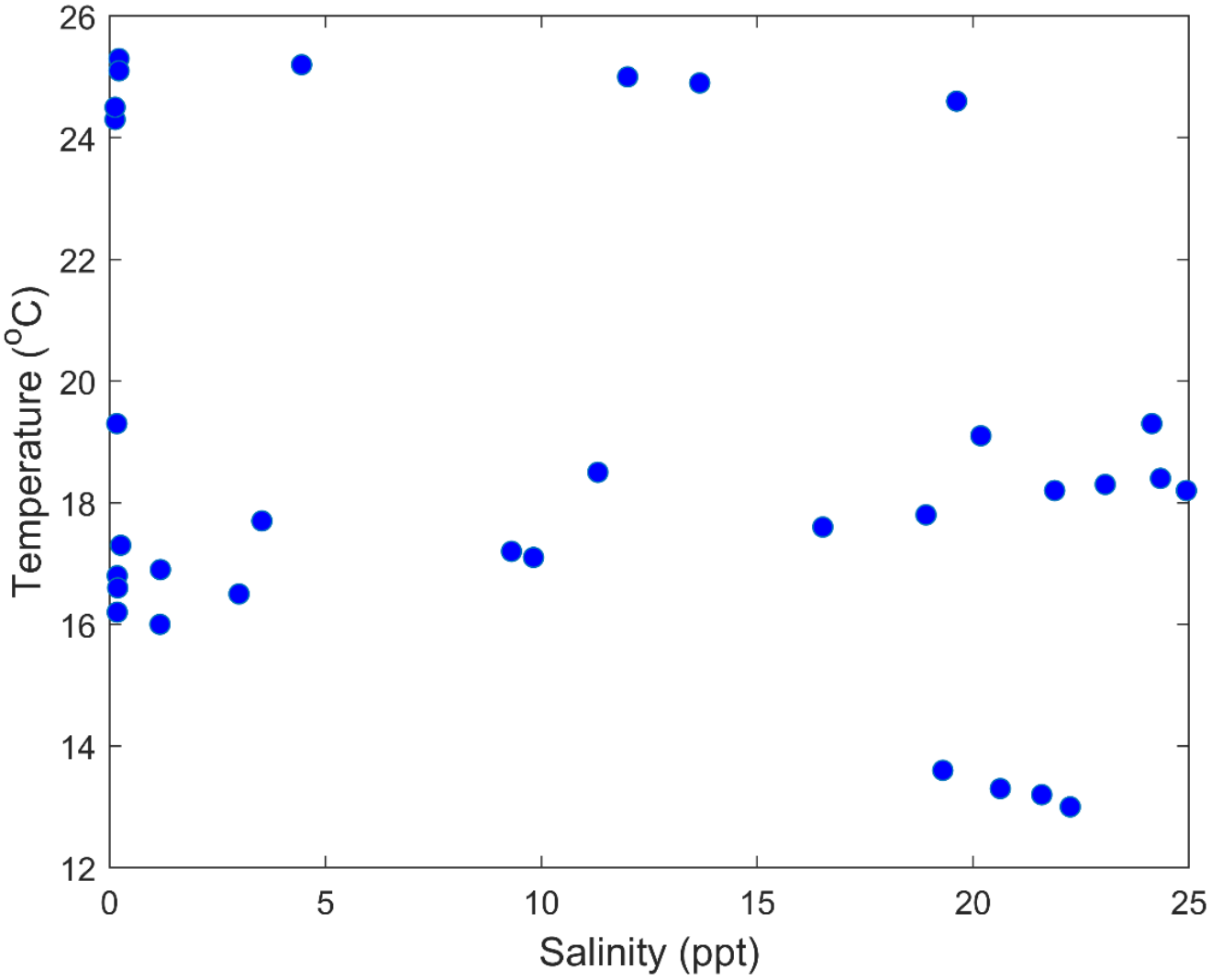
- smooth bottom,
- deep channel (thalweg)
- small benthic oriented fish






Edison
Rutgers University Livingston Campus
Sam's Club
KEASBEY
SHI Stadium
Perth Amboy
Rutgers–New Brunswick
New Jersey Convention and Exposition Center
Highland Park
Raritan River
New Brunswick
South Amboy Arena Rollermagic
Rutgers University –New Brunswick...
Raritan Bay Waterfront
South Amboy
PARLIN
Sayreville
RAR01
RAR02
RAR03
RAR04
RAR05
RAR06
RAR07
RAR08
MADISON PARK
Cheesequake State Park
0
1.25
2.5
5 Miles
Google Earth

Hydrography



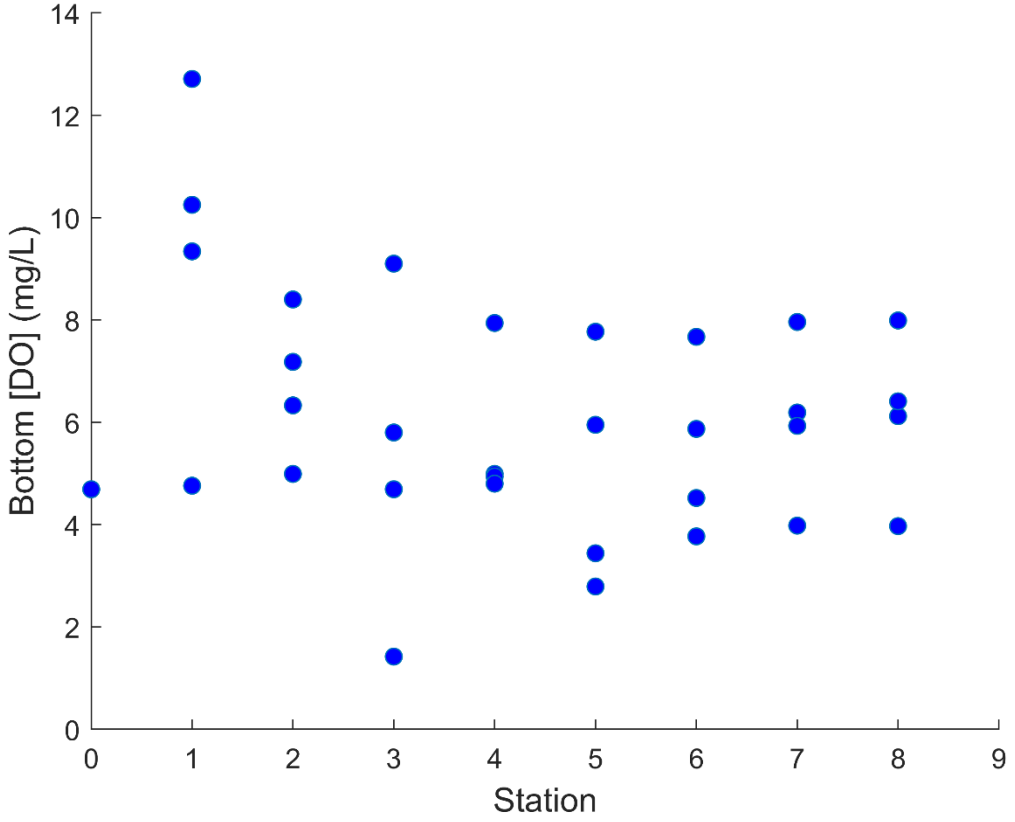
Salinity

Min = 0.13
Max = 24.94
Mean = 10.89

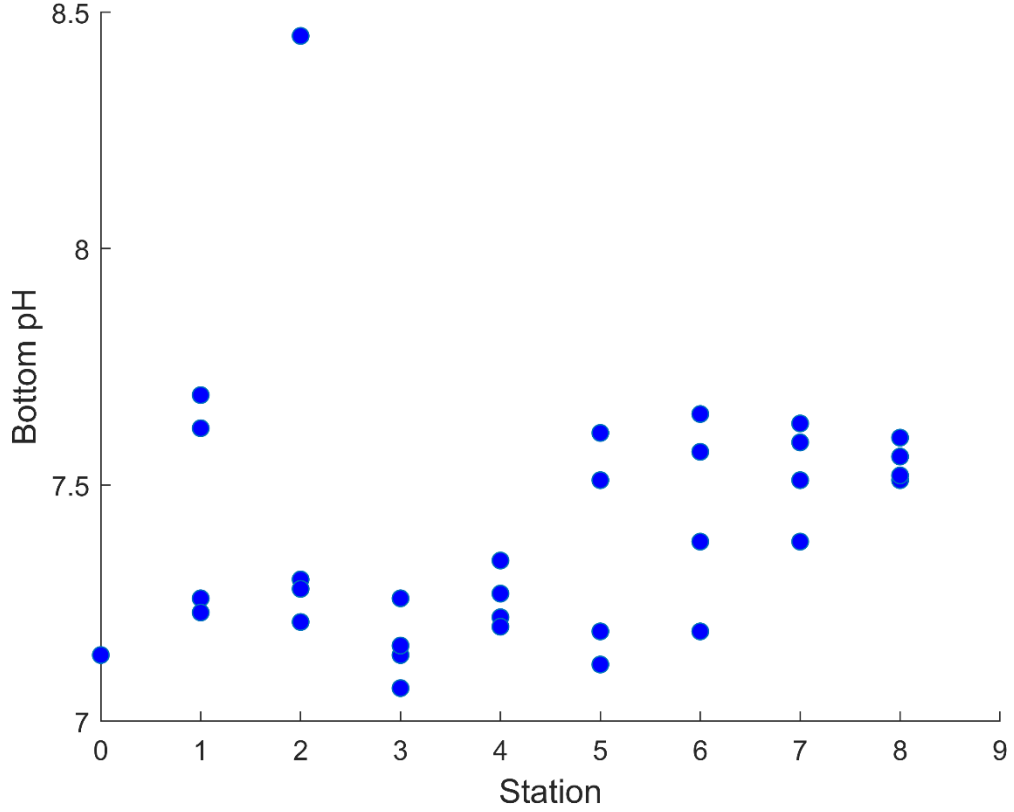
Temperature

Min = 13.00
Max = 25.30
Mean = 18.91

Hydrography

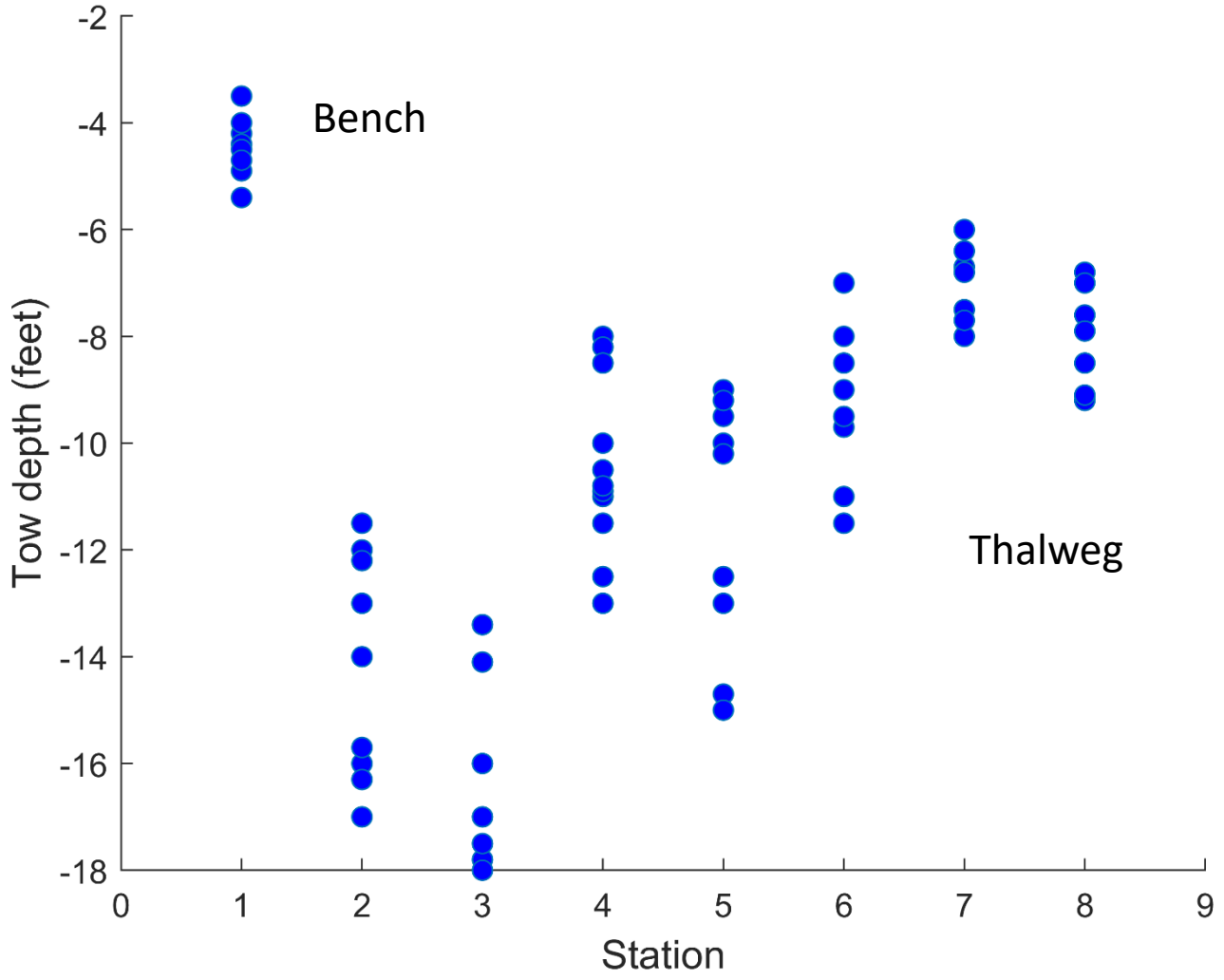


[DO] mg/L
Min 1.42
Max 12.71
Mean 6.19



pH
Min 7.07
Max 8.45
Mean 7.41

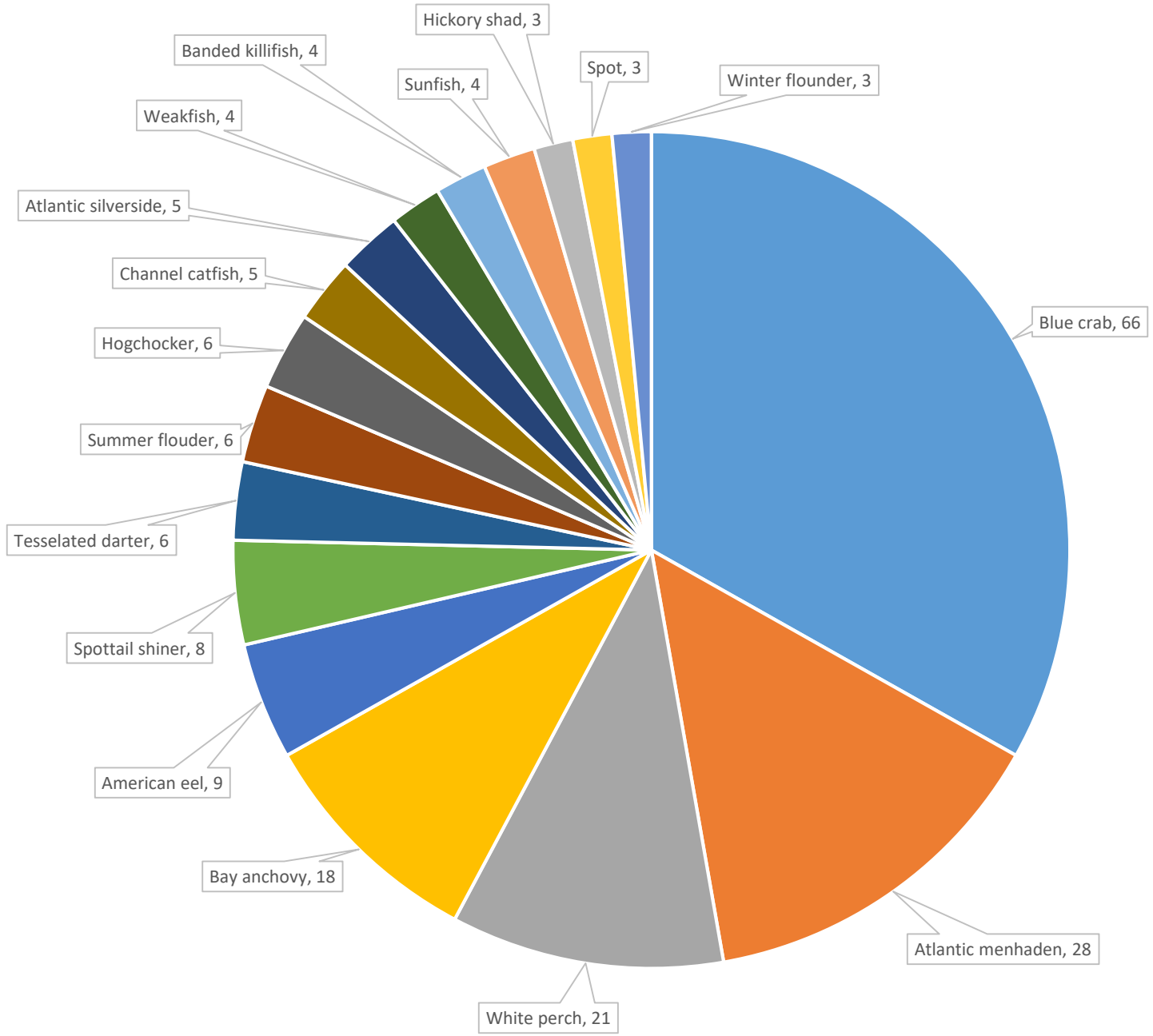
Trawl Depth


Bench
Thalweg
Tow depth (feet)
Station
-2
-4
-6
-8
-10
-12
-14
-16
-18
0
1
2
3
4
5
6
7
8
9

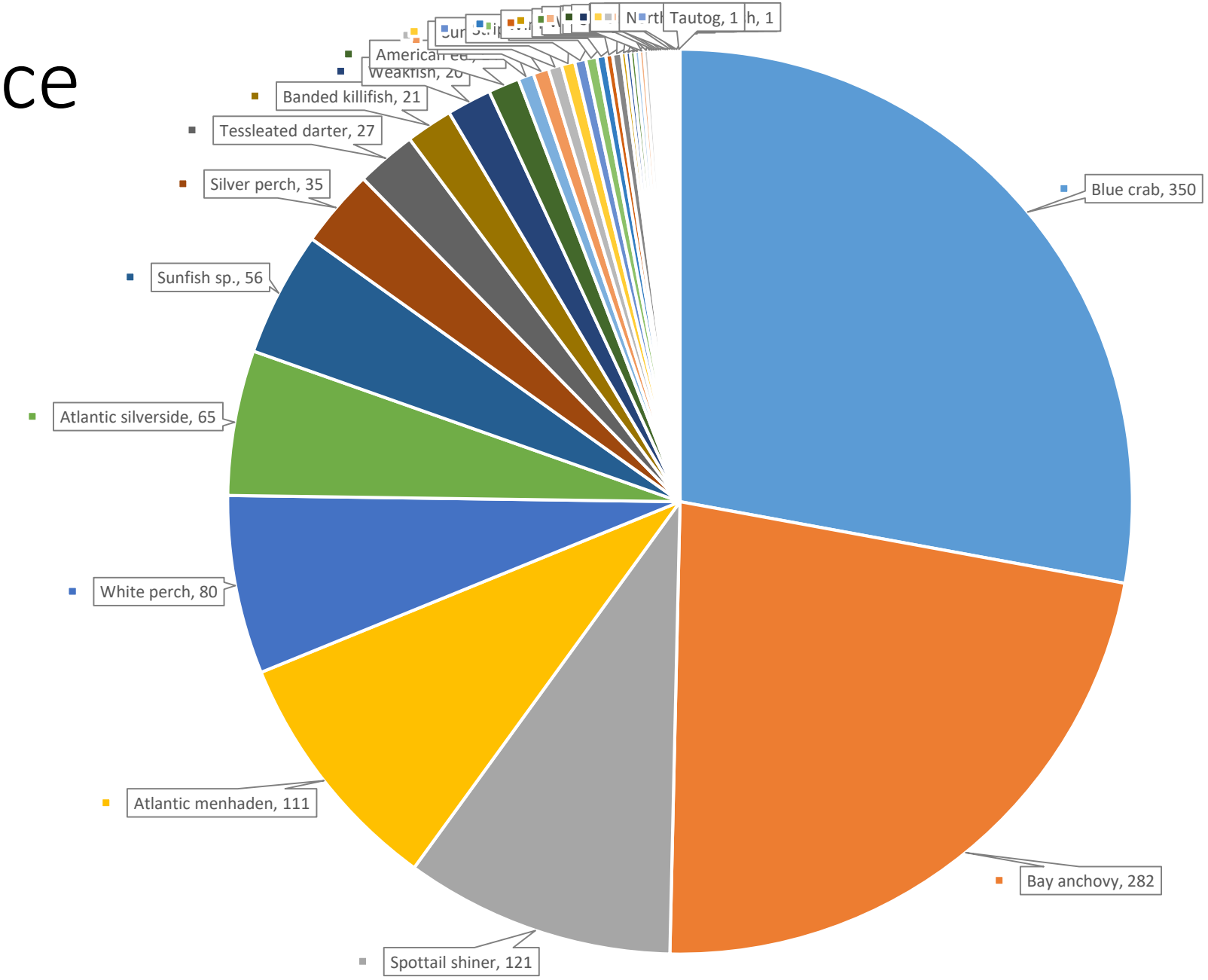
Results Summary

Indicator	Value
Total specimens	1,255 individuals
Richness	39 species
Singletons	14 species
Total Swept Area	48,567 m^2
Fish Density	2.58 individuals/ 100 m^2

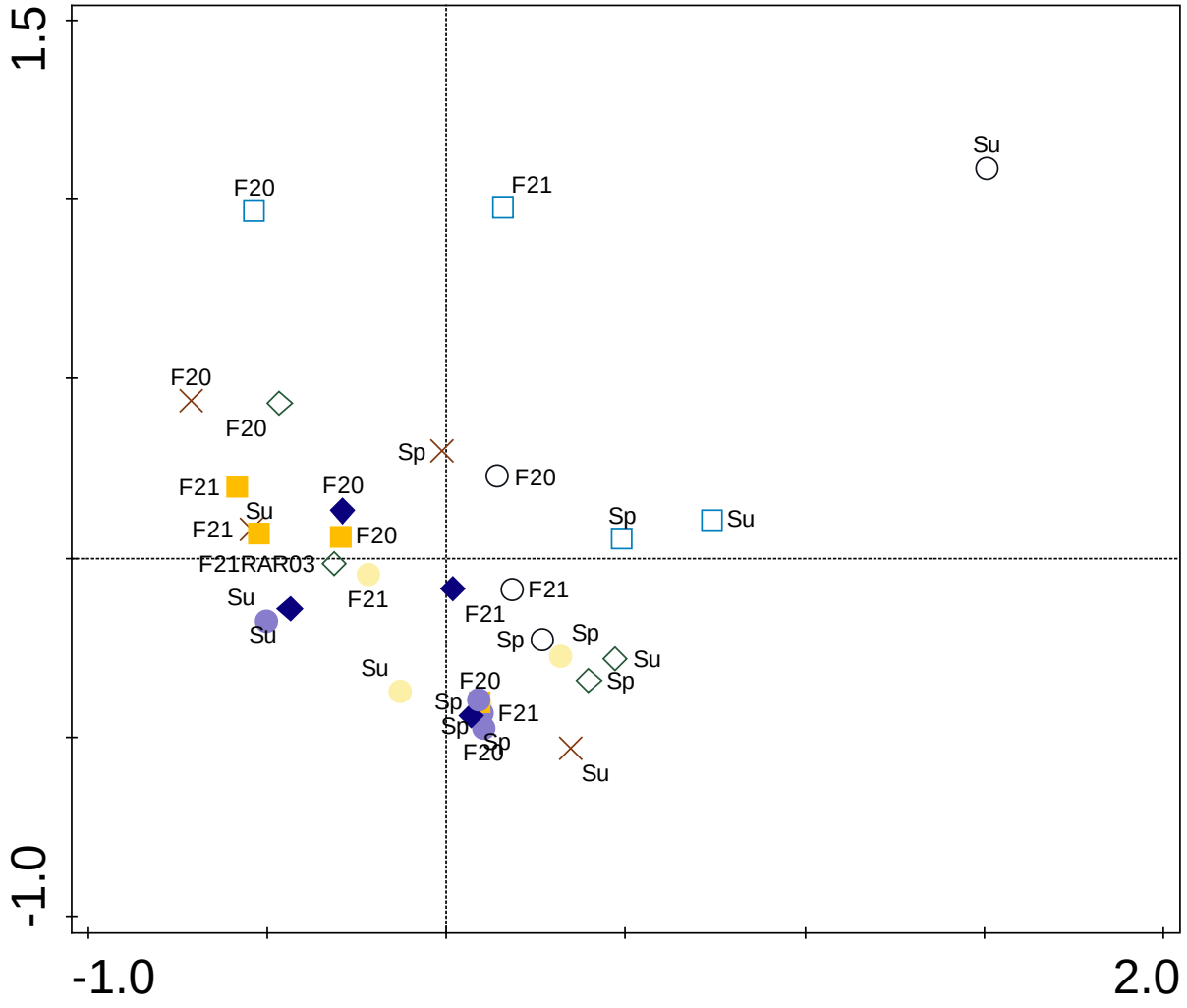
Frequency of Occurrence (>2)

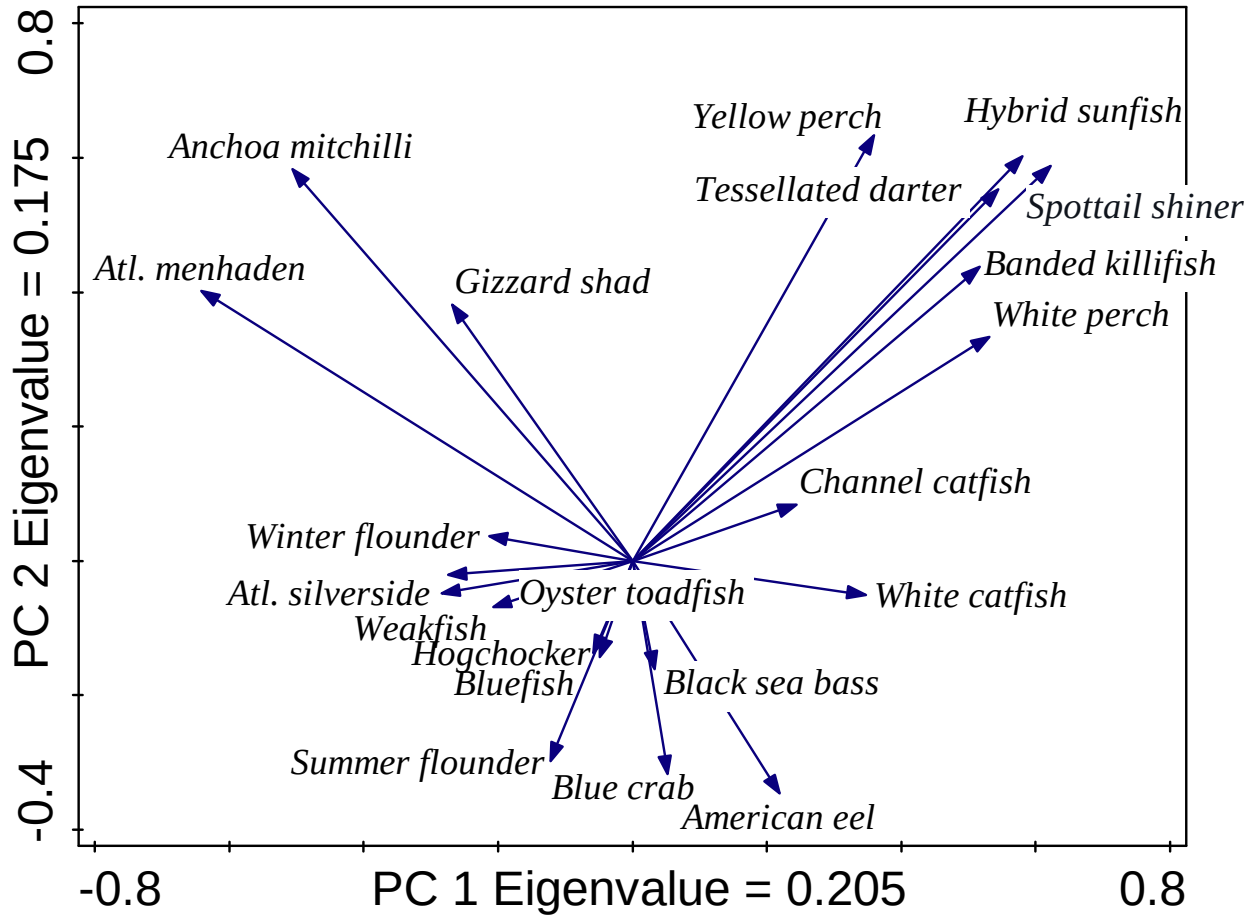


Abundance


Tautog, 1
Banded killifish, 21
Tessleated darter, 27
Silver perch, 35
Sunfish sp., 56
Atlantic silverside, 65
White perch, 80
Atlantic menhaden, 111
Spottail shiner, 121
Bay anchovy, 282
Blue crab, 350

Principal components analysis (FO>2)

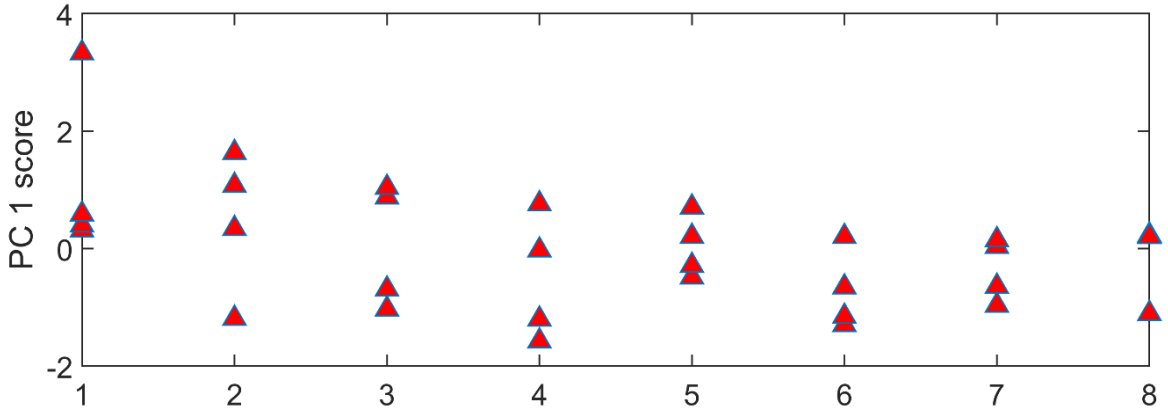


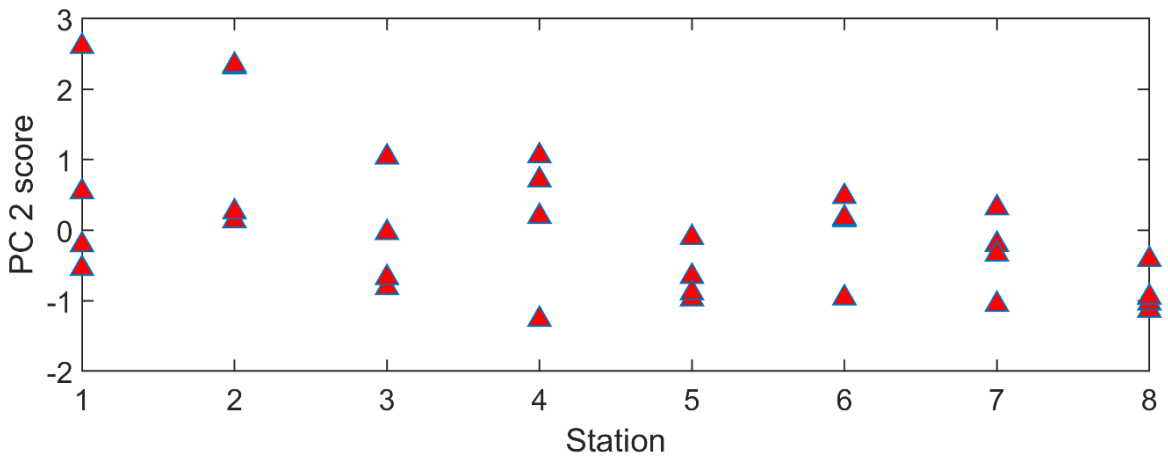


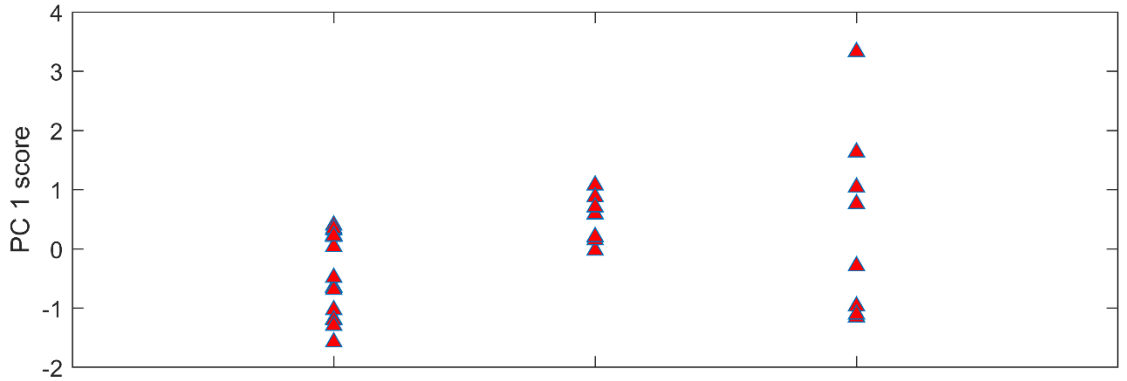
Samples

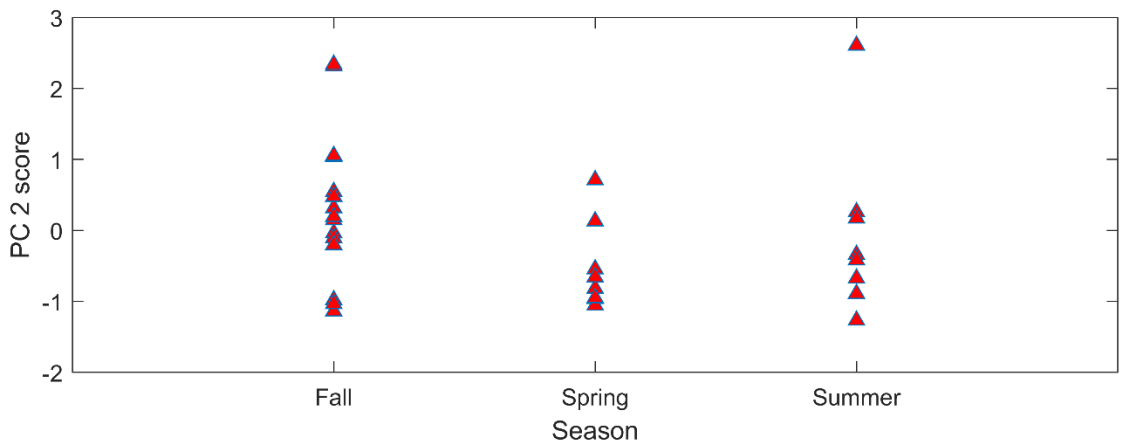
Statn. 1 | Statn. 2 | Statn. 3 | Statn. 4 | Statn. 5 | Statn. 6 | Statn. 7 | Statn. 8

Mean Diversity (H') = 1.2017, range [0 - 2.5682]









First order variation is spatial along salinity gradient

…and seasonal;, Some second order variation is seasonal

Initial Findings and Limitations of Otter Trawl Survey Method

- Baseline established
- Assemblage of fishes vulnerable to otter trawl is highly skewed to a few species
- Misses shoreline species
- Misses active and large species
- Confusing meristics and hybrids or not fully described
- Seasonally variable

Acknowledgements

- Dr. Kendall Simon (USFWS)

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  - Thomas Ertle
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