SEEING THE FOREST THROUGH THE DEAD SEAGRASS

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Outline

- Why sportfish are important? And how are they used for Everglades Restoration?
- What do they tell us about the “health” of Florida Bay
- How did they respond to the seagrass die-offs
- Chris’ hypotheses

Everglades Sport Fishery

- Generates ~US $880 Million per annum and >6,000 jobs (Fedler et al. 2009)

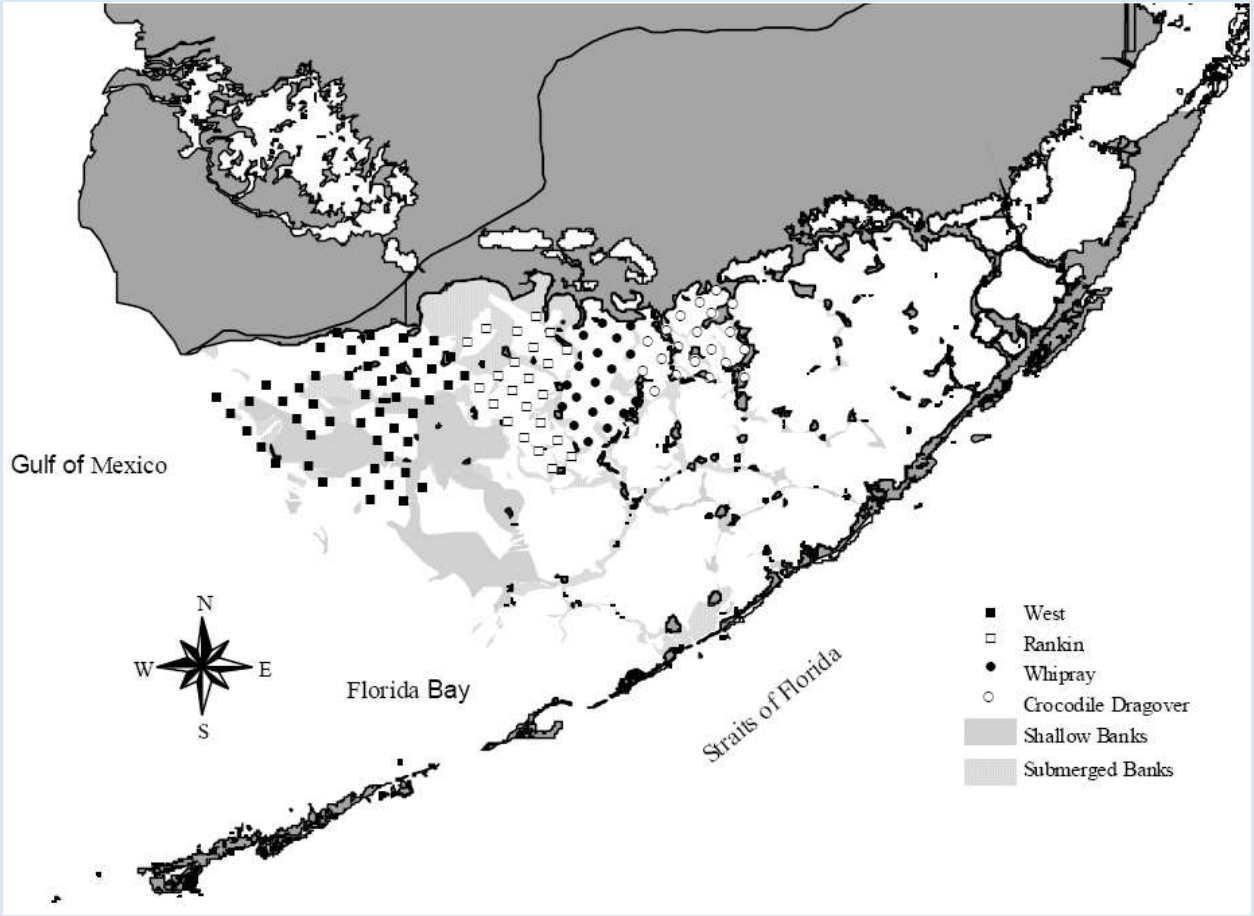
- Spotted Seatrout (*C. nebulosus)* 2nd most commonly caught fish in Florida Bay
- *C. nebulosus* spend entire life history in natal Bay

Population Controls

1. Physiology
2. Recruitment
3. Prey
4. Predators (and the ability to hide from them)

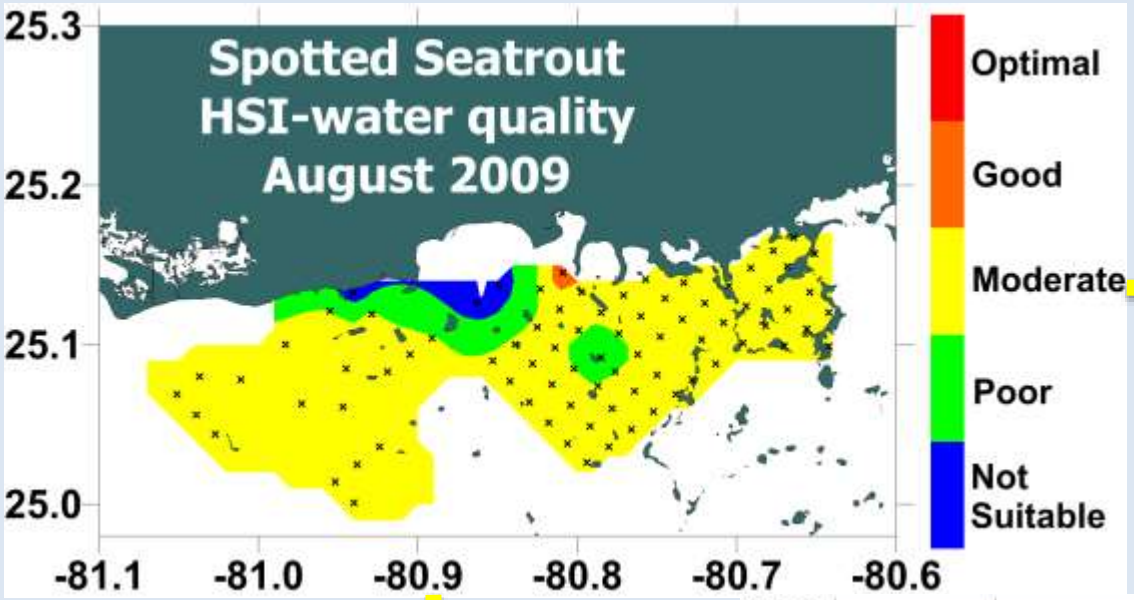
Methodology

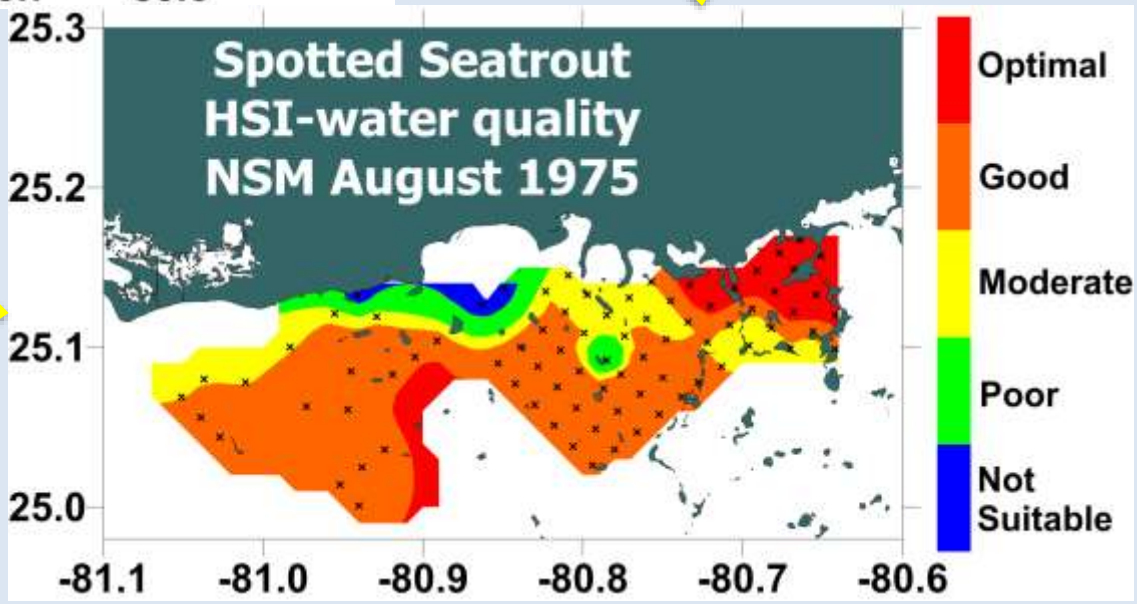
- May-Oct
- Monthly
- Otter trawls
- Seagrass, T, S
- Stratified Random Sampling
- Optimized with power analysis



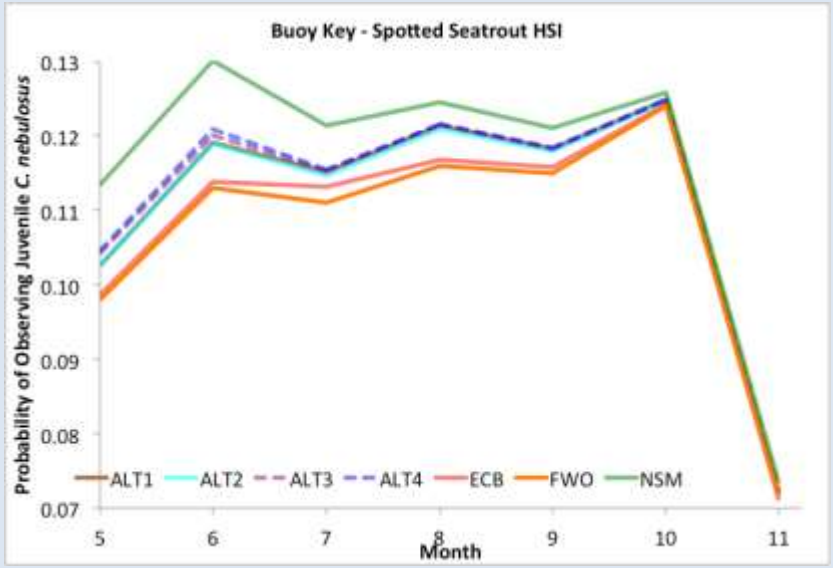
Sampling: 2004-present, 1994-2001, 1984-1985

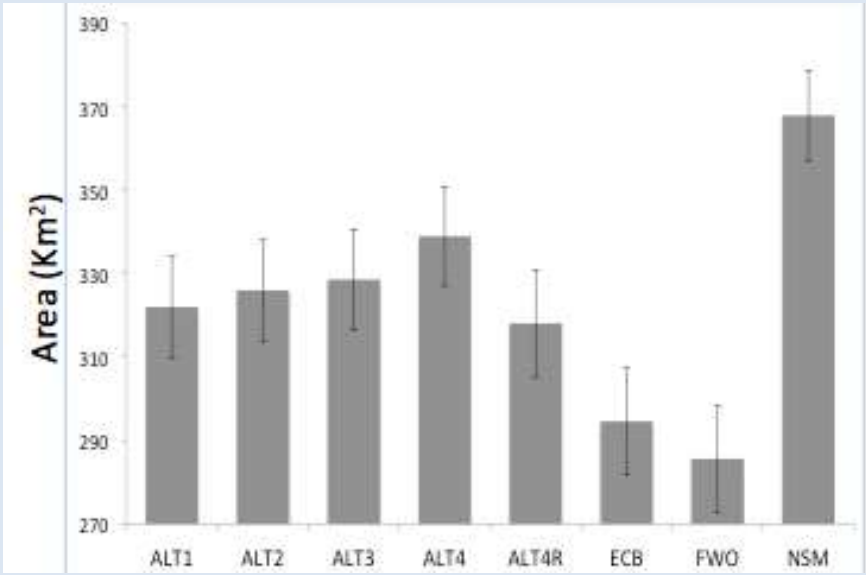
Performance Measure

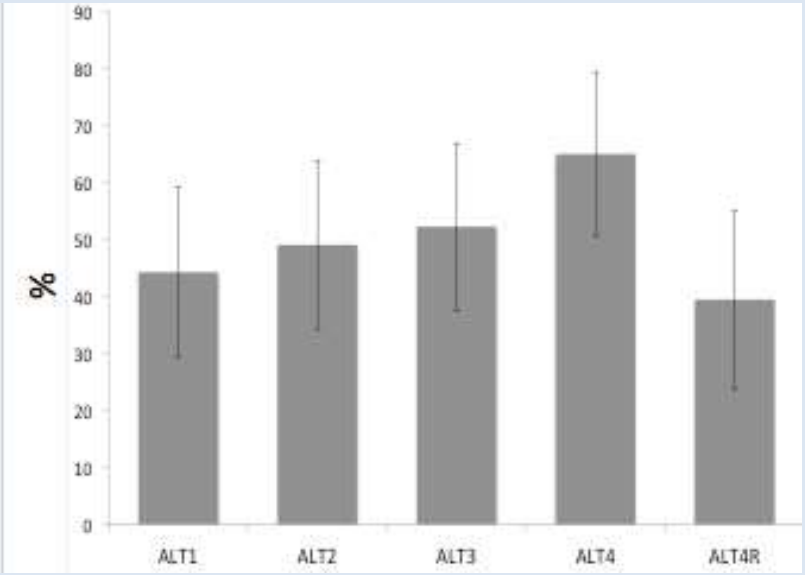




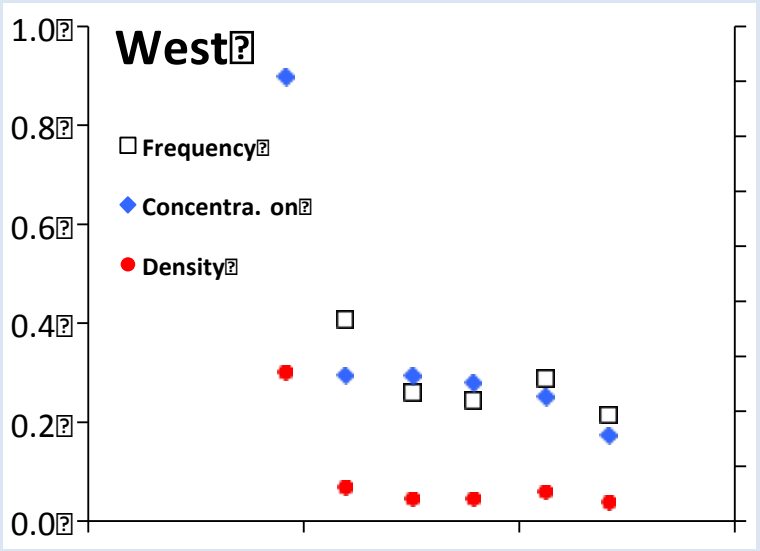
Performance Measure

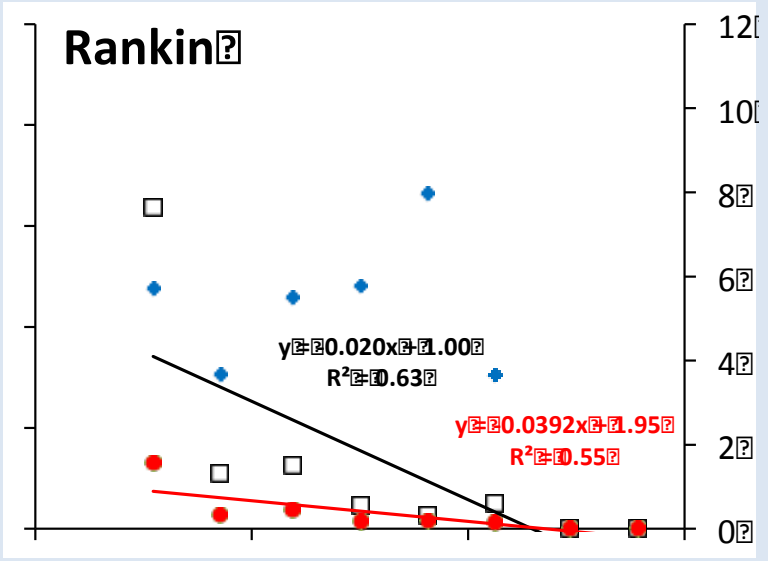


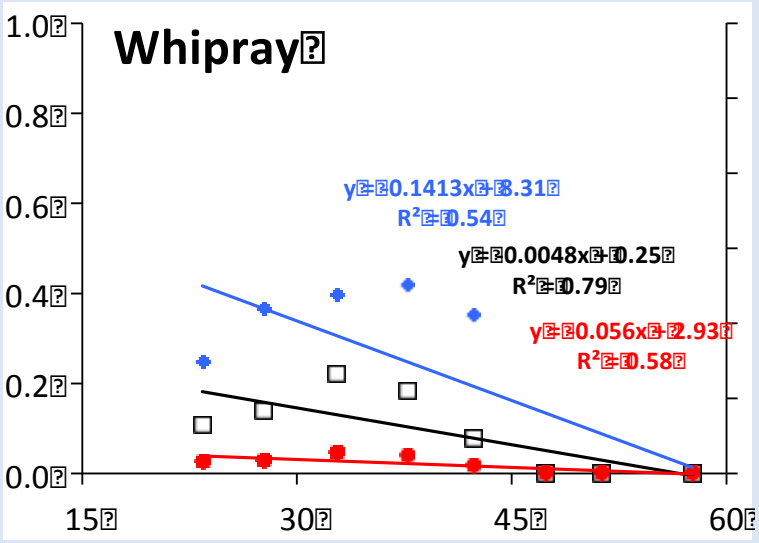


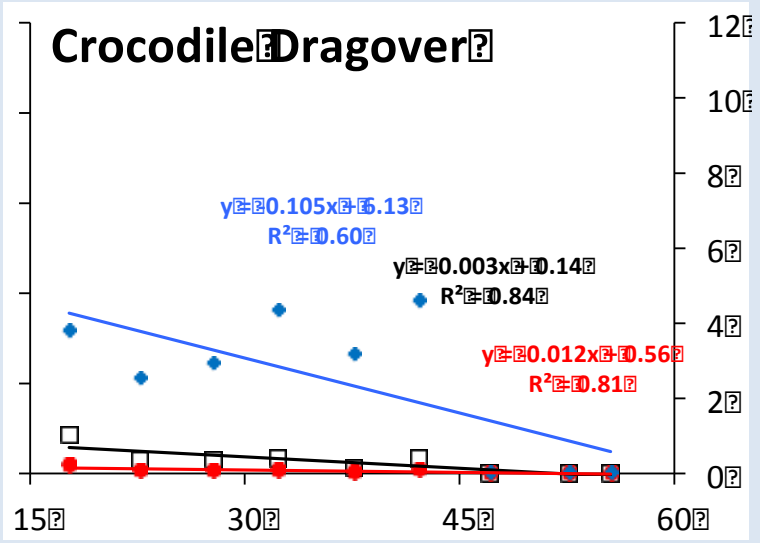


Salinity Effect







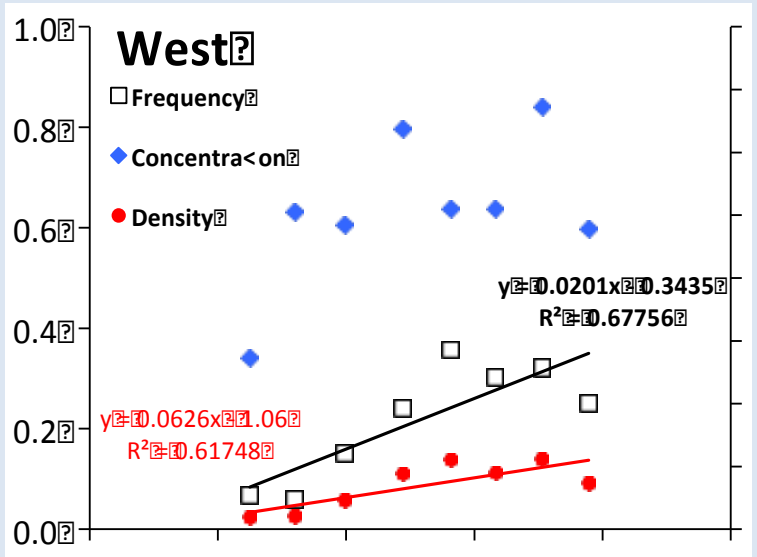


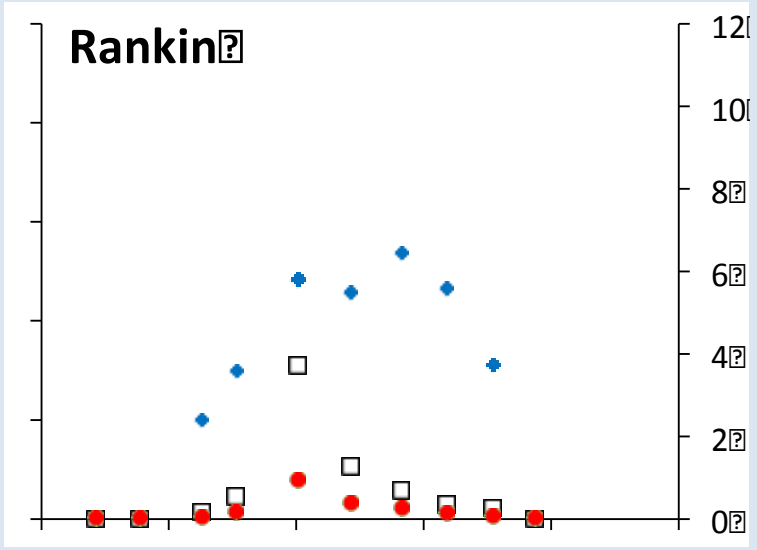
Frequency of Occurrence

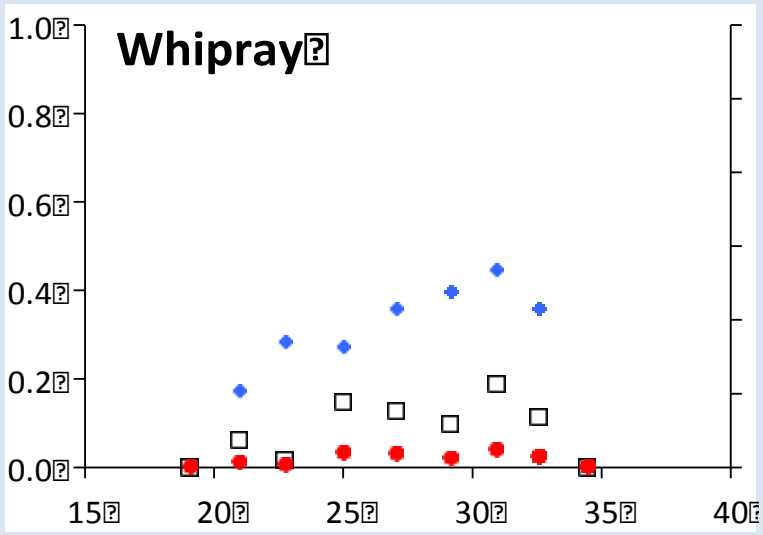
Density (# 1000m^{-2}) & Concentration

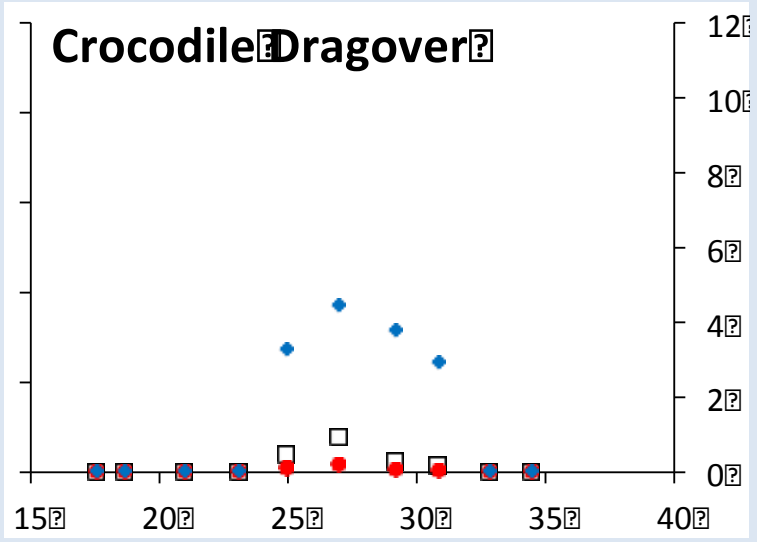
Salinity

Temperature Effect







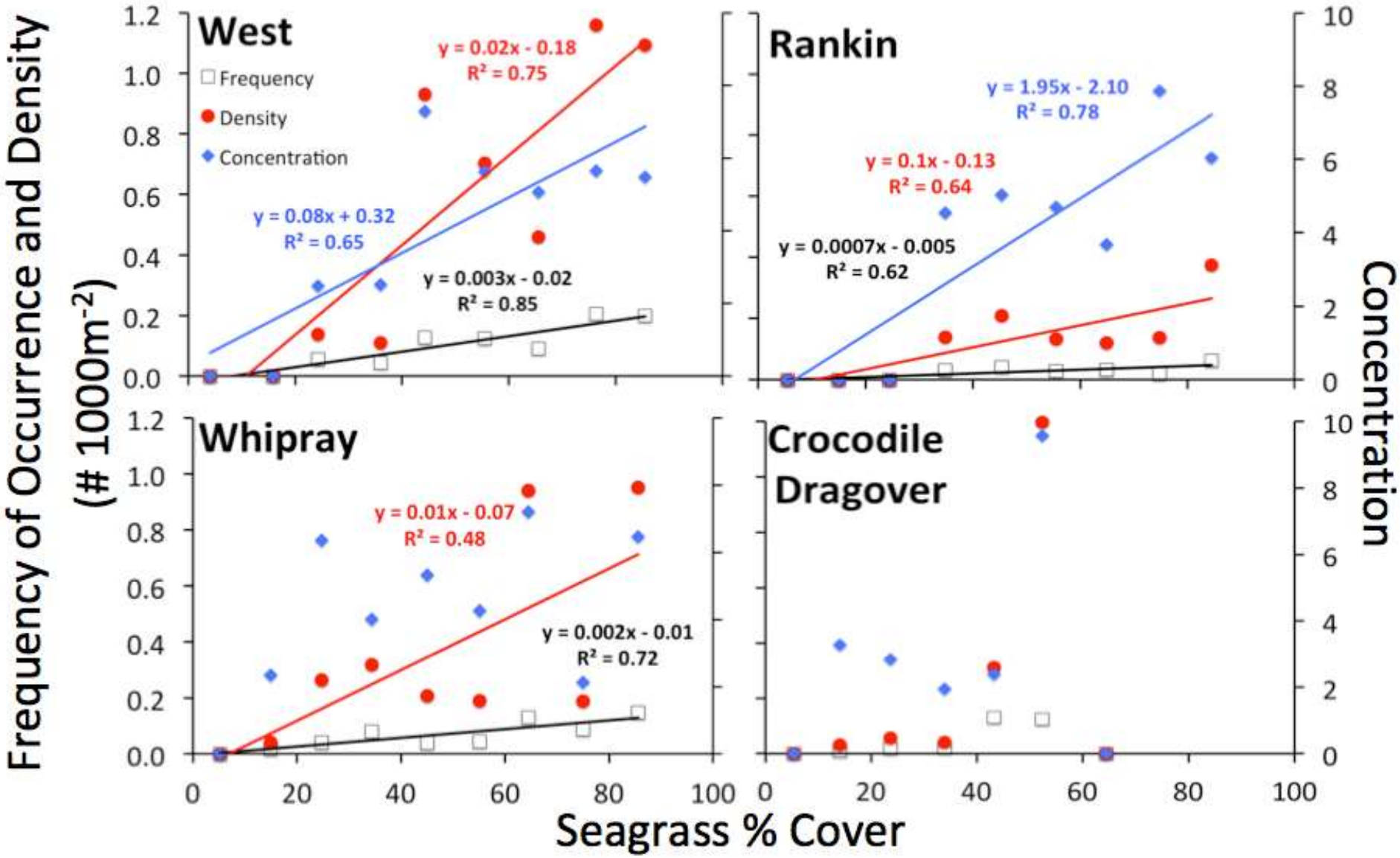


Frequency of Occurrence

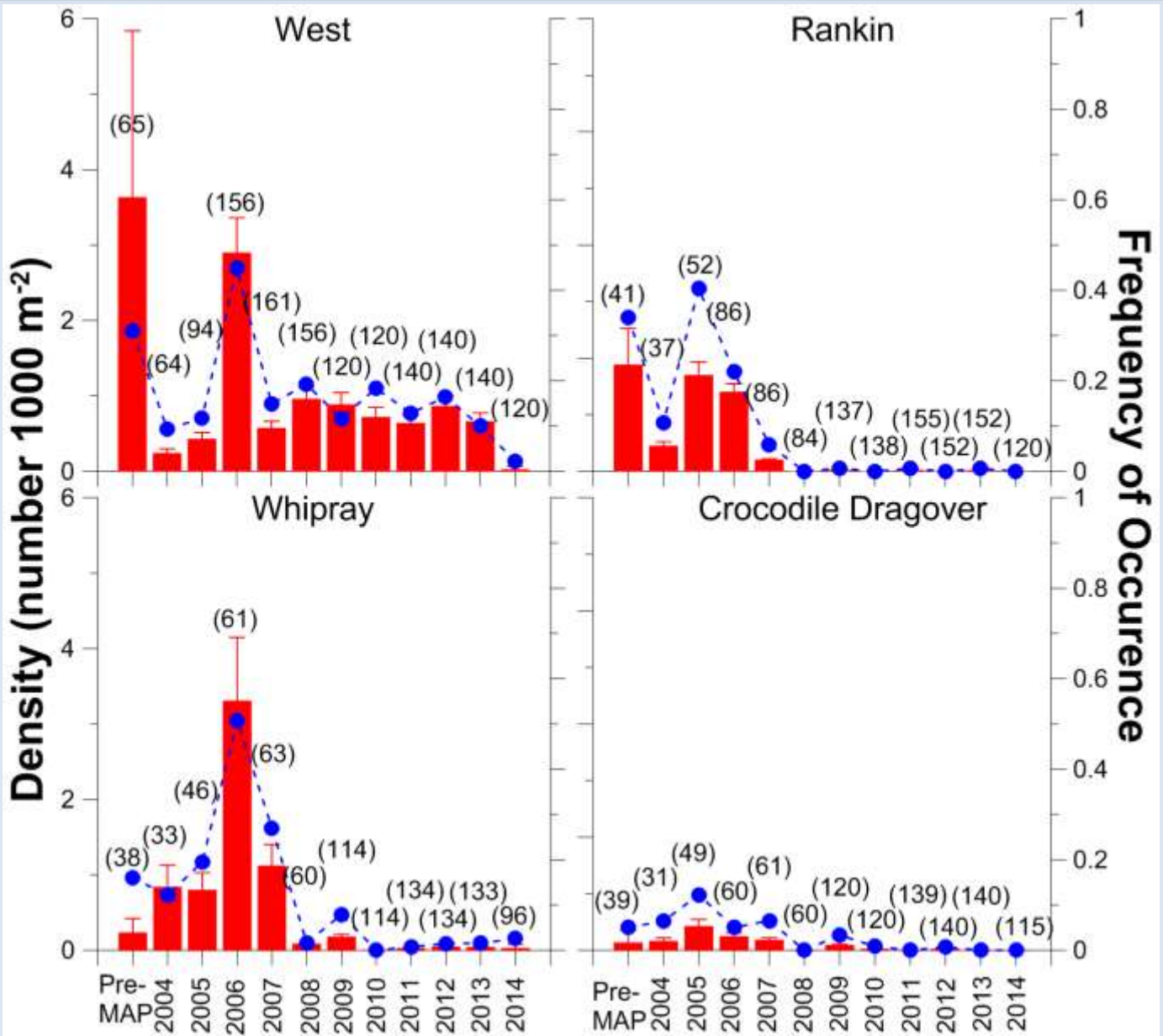
Density (#/1000m^{-2}) & Concentration

Temperature

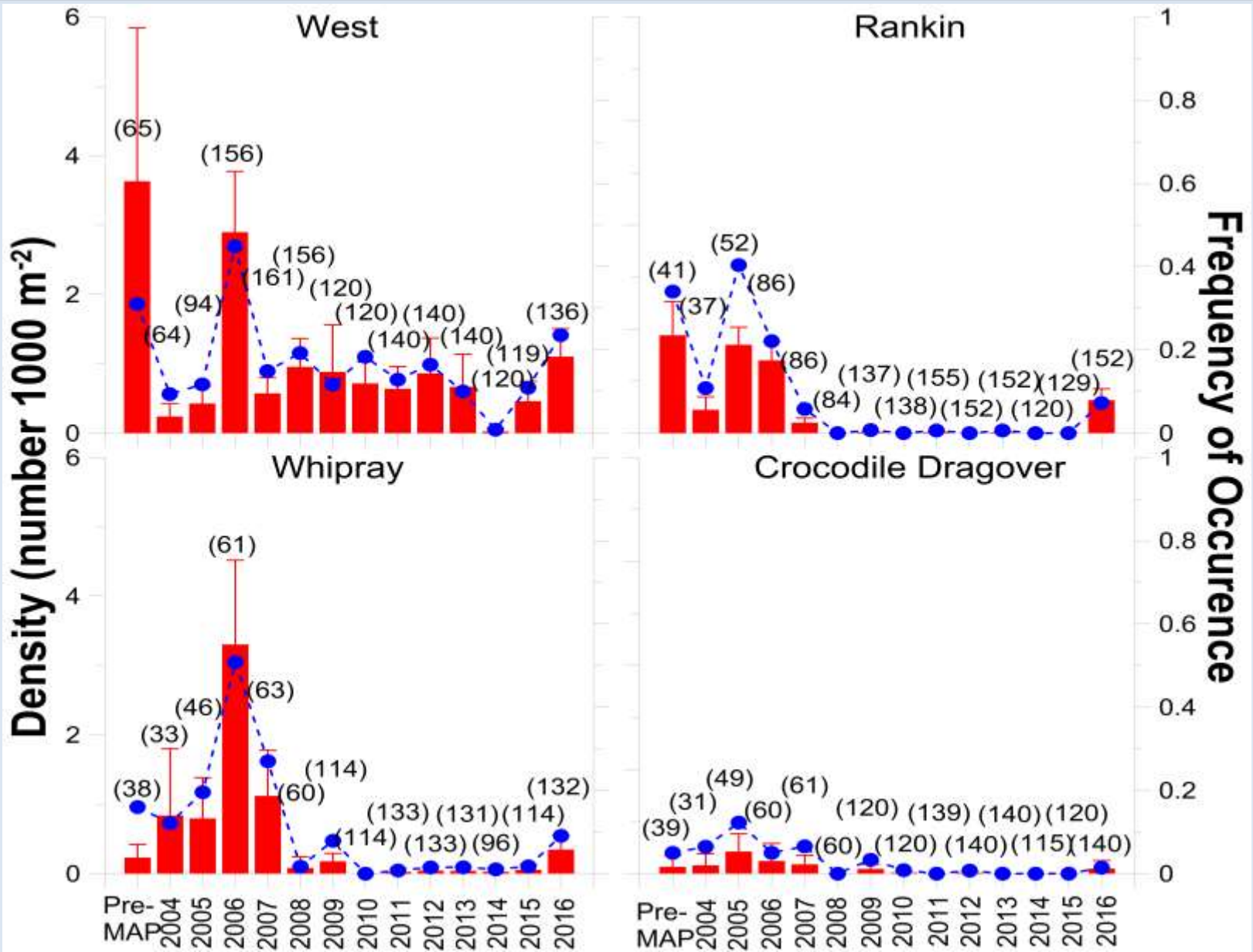
Seagrass Effect



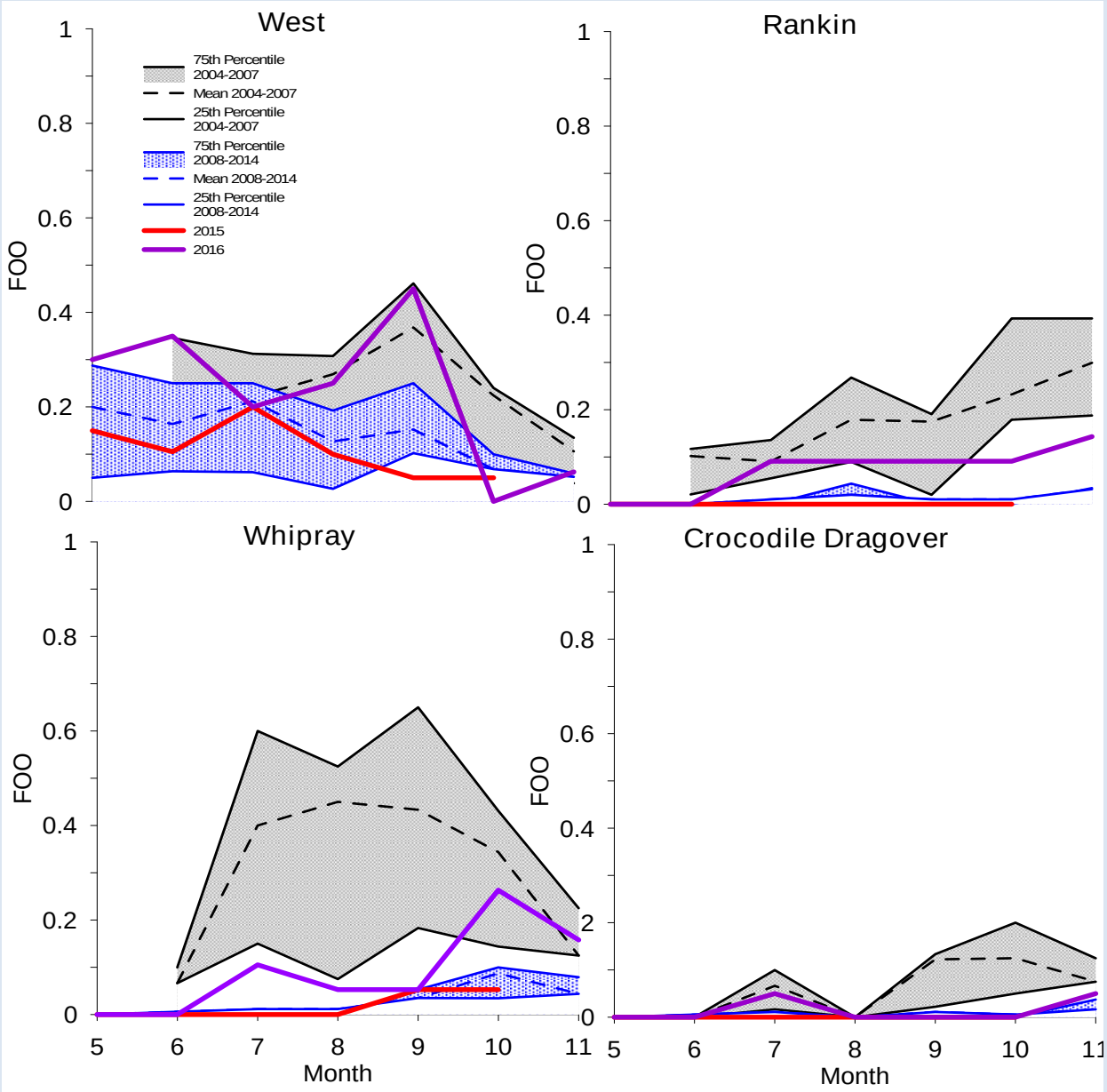
11-year Time Series



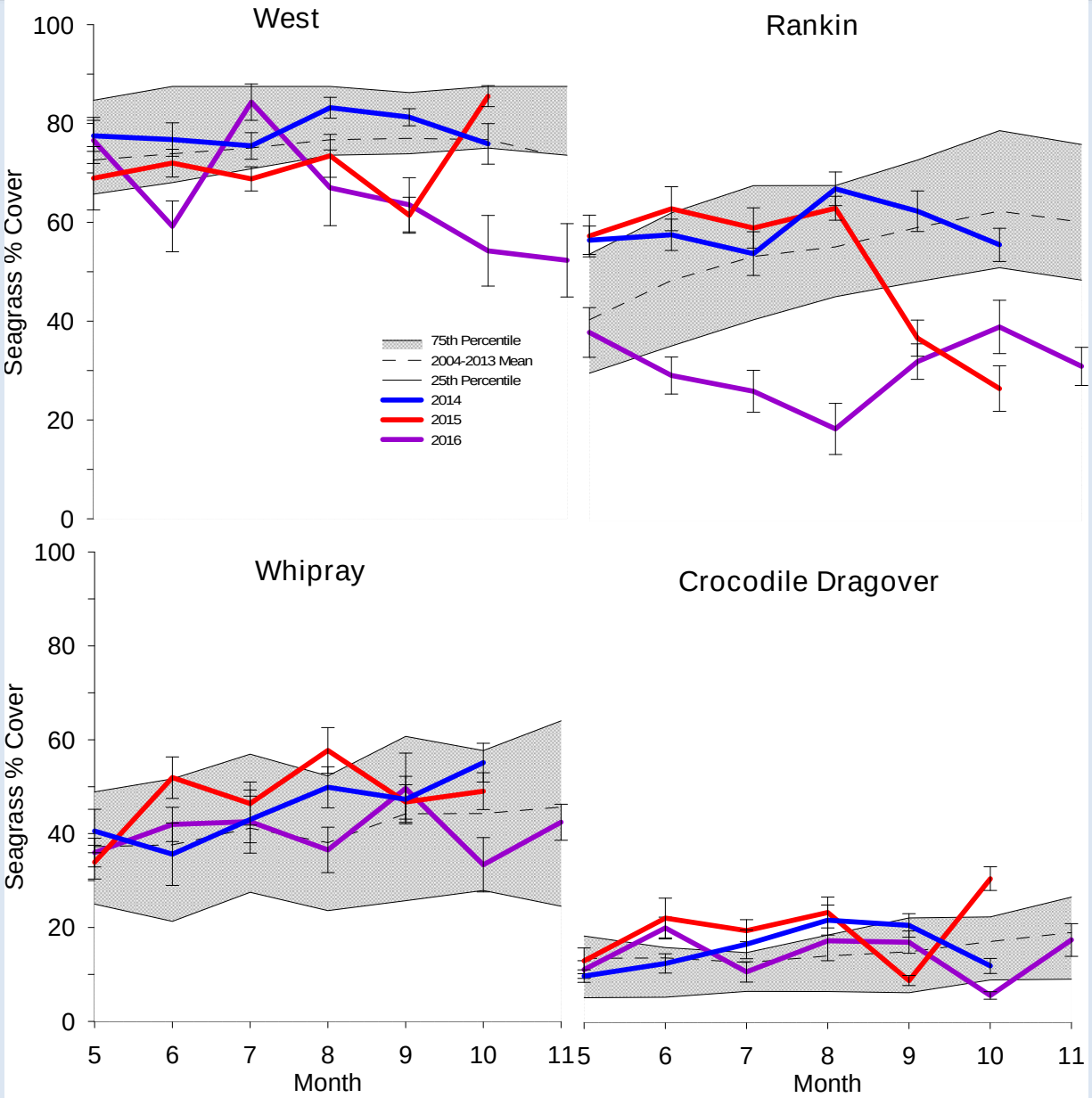
Including the Die-off



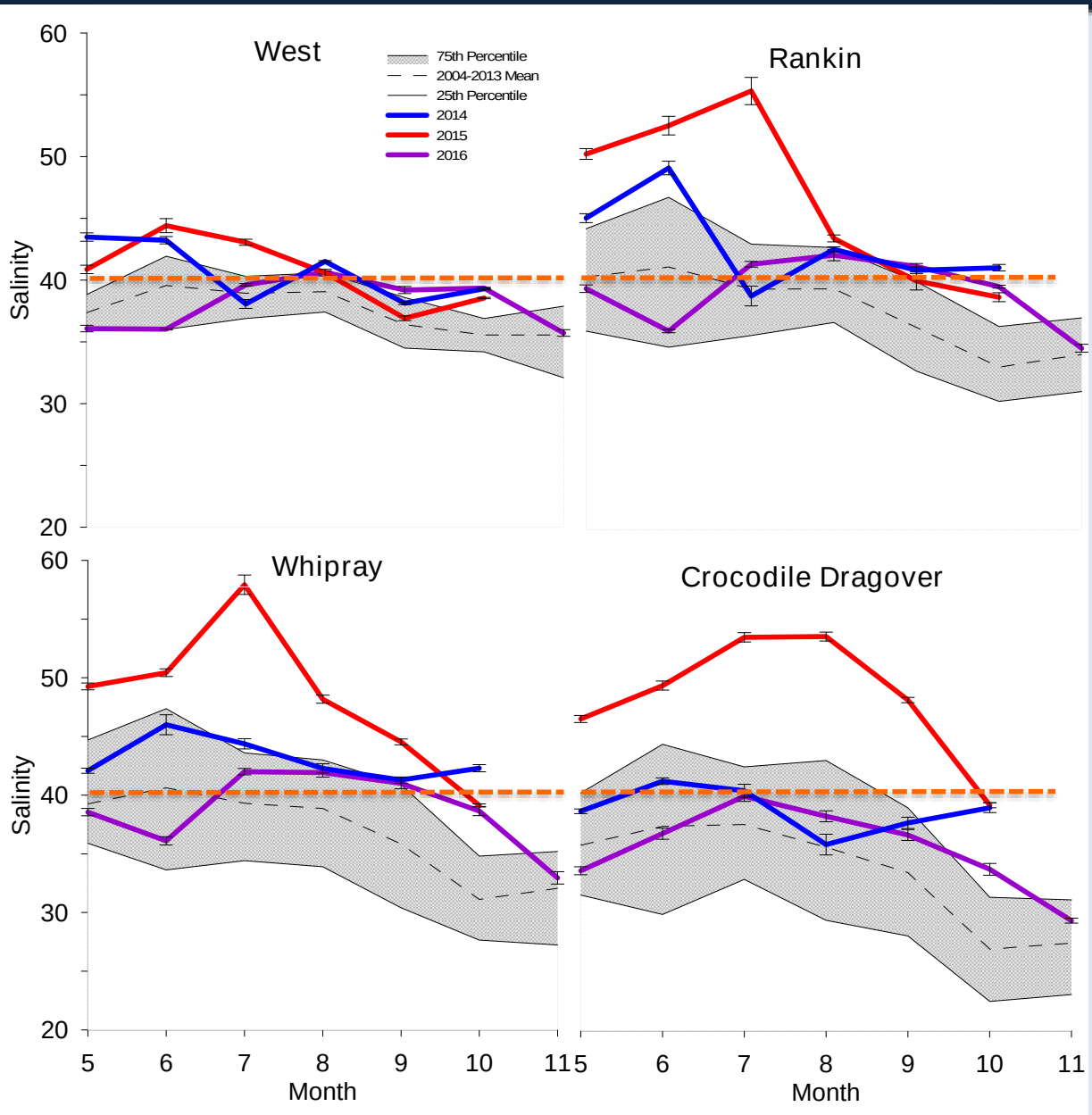
Before, During, After



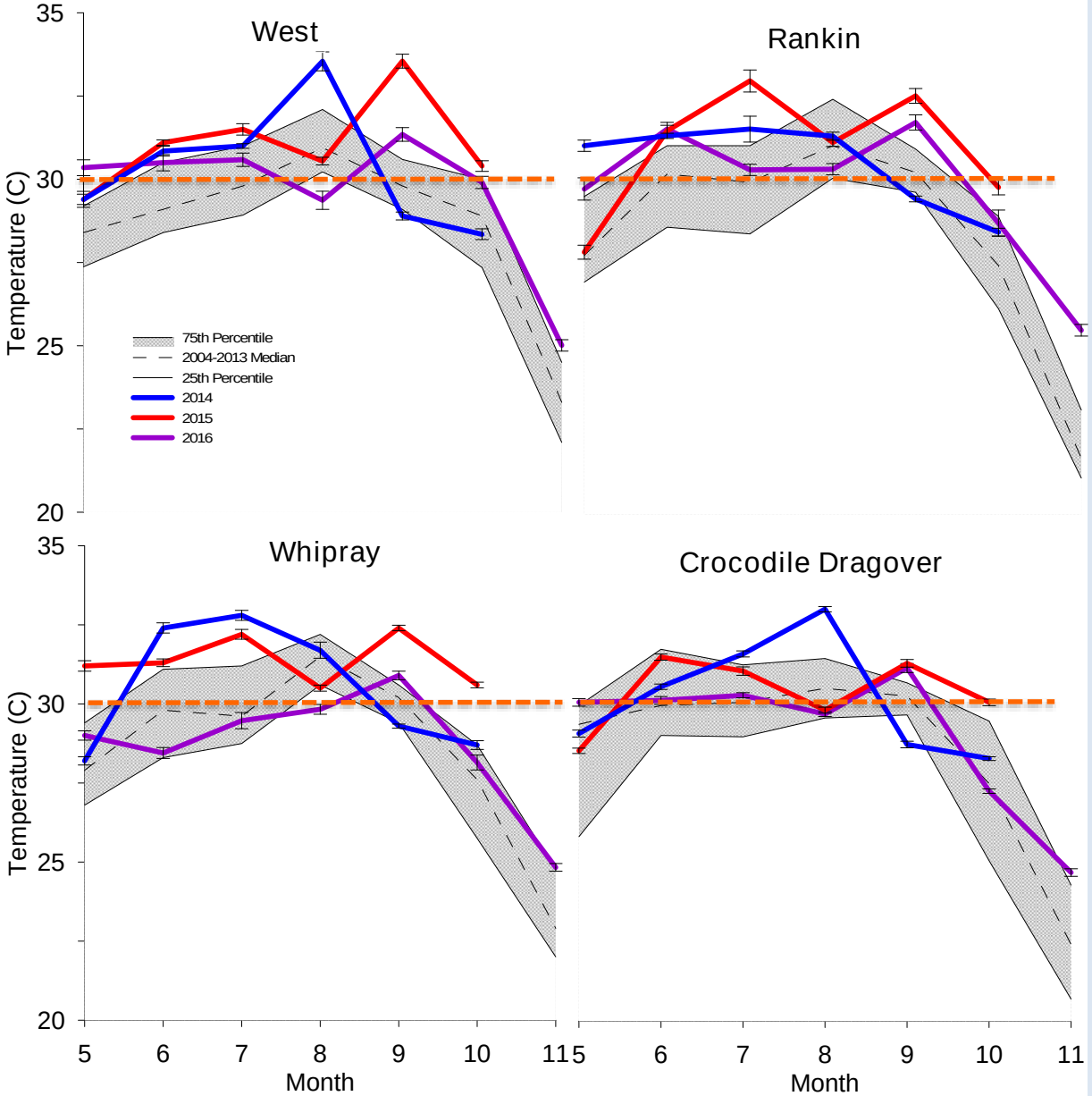
Why?


West
Rankin
Whipray
Crocodile Dragover
Seagrass % Cover
100
80
60
40
20
0
75th Percentile
2004-2013 Mean
25th Percentile
2014
2015
2016
5
6
7
8
9
10
11
Month

Why?


West
Rankin
Whipray
Crocodile Dragover
75th Percentile
2004-2013 Mean
25th Percentile
2014
2015
2016
Salinity
Month
60
50
40
30
20
5
6
7
8
9
10
11

Why?


West
Rankin
Whipray
Crocodile Dragover
Temperature (C)
35
30
25
20
75th Percentile
2004-2013 Median
25th Percentile
2014
2015
2016
5
6
7
8
9
10
11
Month

Summary

- Less seagrass habitat in Rankin and West
  - May be offset by increased turbidity
- Lower physiological stress in 2016 compared to 2014 & 2015
- Hypothesis: Increased prey in 2016
  - increased phytoplankton

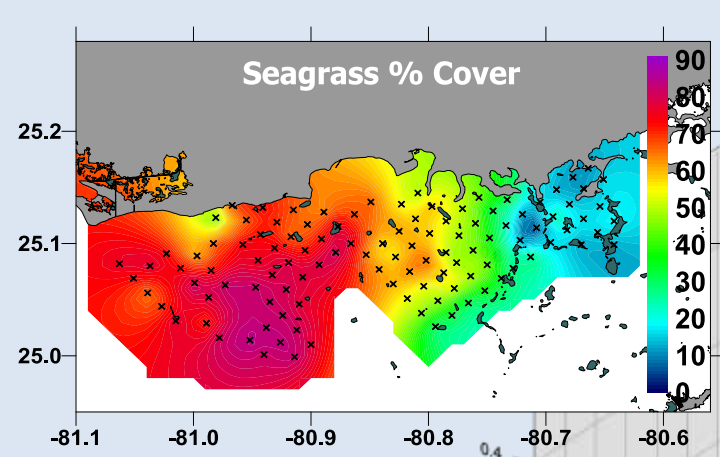
Next Steps

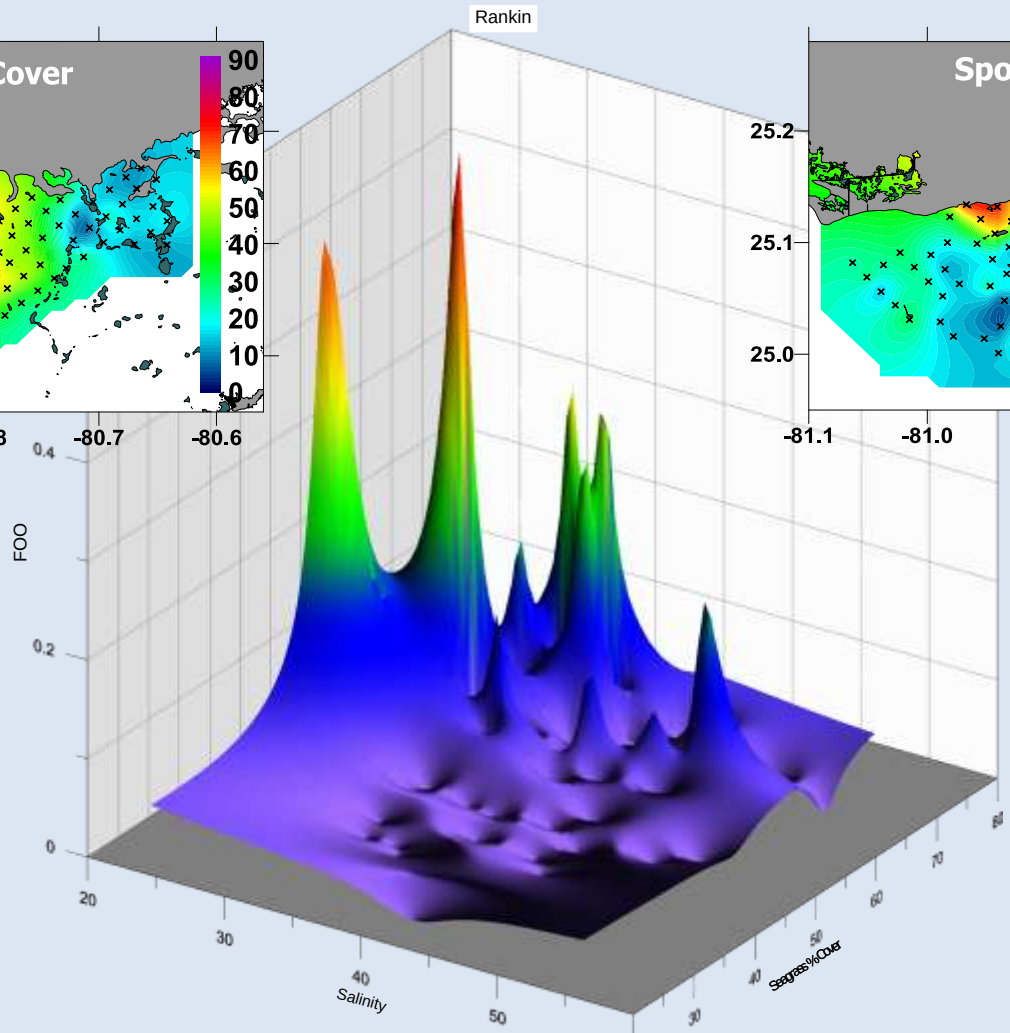
- Apply juvenile seatrout HSI models for 2014-2016 for water quality and seagrass
  - Interactive effects & validation of models
- Compare gut contents in 2016 versus 2014-2015
- Examine abundance of prey species in 2016 versus 2014-2015
- Examine potential relationship to turbidity
- Predator abundance (Creel Survey)

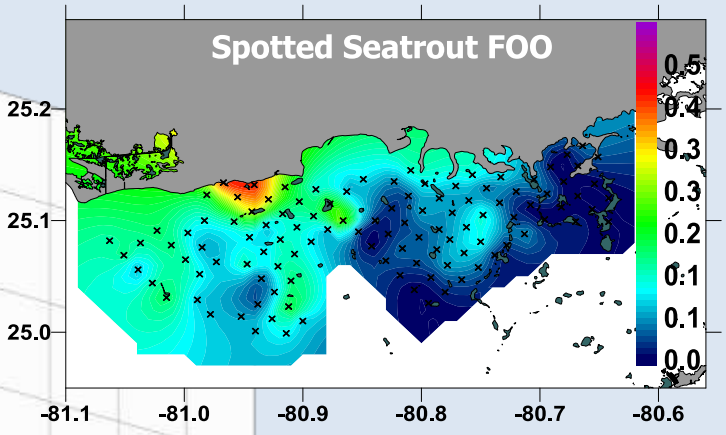
Acknowledgements

- Statistical & Modeling Assistance
  - Kelly Kearney, Lindsey Visser, Patrick Pitts, Betty Huss, Allyn Powell, Don Deis, Frank Marshall
- Field Assistance
  - Lindsey Visser, Joseph Contillo, Timothy Cook, Michelle Harangoby, Geoffrey Cook, Mike Lacroix, Patrick Cope
- Lab Assistance
  - Betty Huss, Laura Petteway, Robin Cascioli, Lloyd Moore, Timothy Cook, Tom Jackson

Seagrass Relationship







Lower salinities and higher seagrass percent cover correspond to higher seatrout Frequency of Occurrence.