

Reef Fish Recruitment Dynamics: Integration and analysis of long-term visual fish surveys to examine environmental influences

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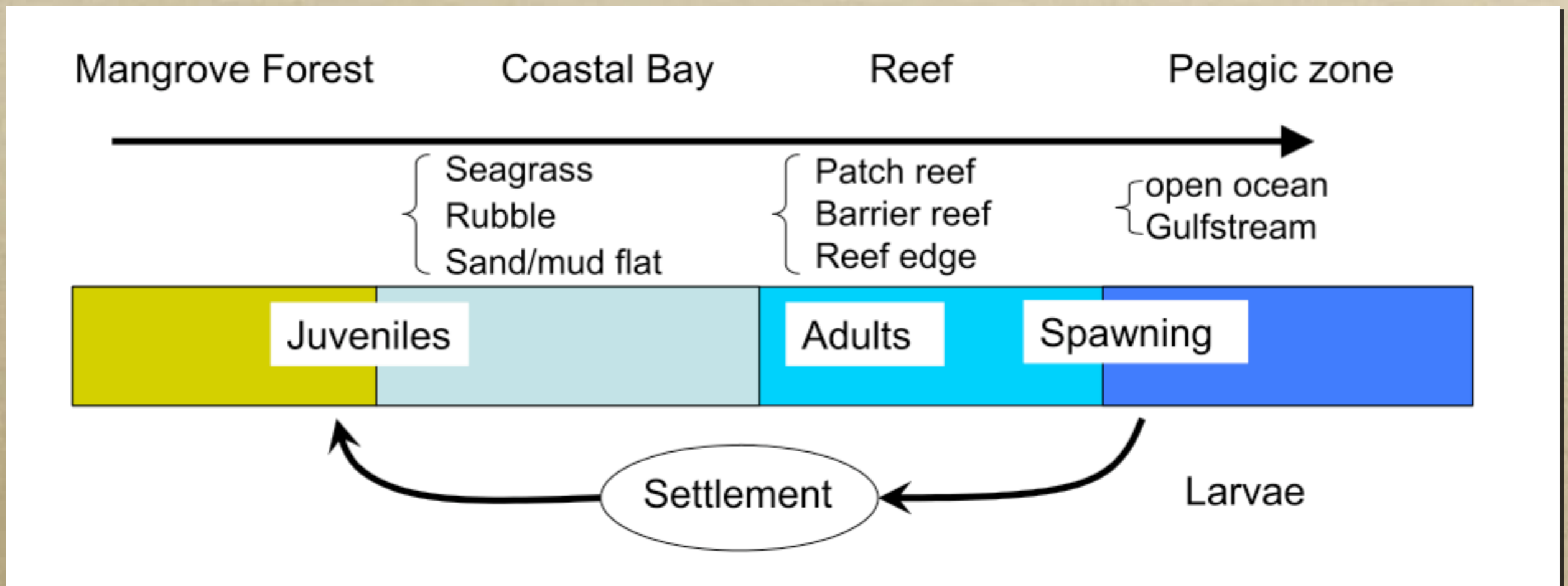


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Life History Transitions



Mangroves: critical nursery habitat for reef fishes?

- Juveniles are abundant
- High food
- Low predation/Shelter

- Limited evidence (*Nagelkerken, 2007*)
 - focused on one habitat
 - juvenile or adult habitat
 - juvenile/adults not distinguished
 - survey methods differed

Objectives

- **Synthesize mangrove/reef fish survey data**
- **Nature and extent of habitat connectivity**
- **Index-of-Recruitment**
 - **annual variability**
 - **environmental influences**
- **Predictive models**

26°N

Southern Florida

Miami

Gulf of Mexico

30'

Everglades



25°N

Straits of Florida

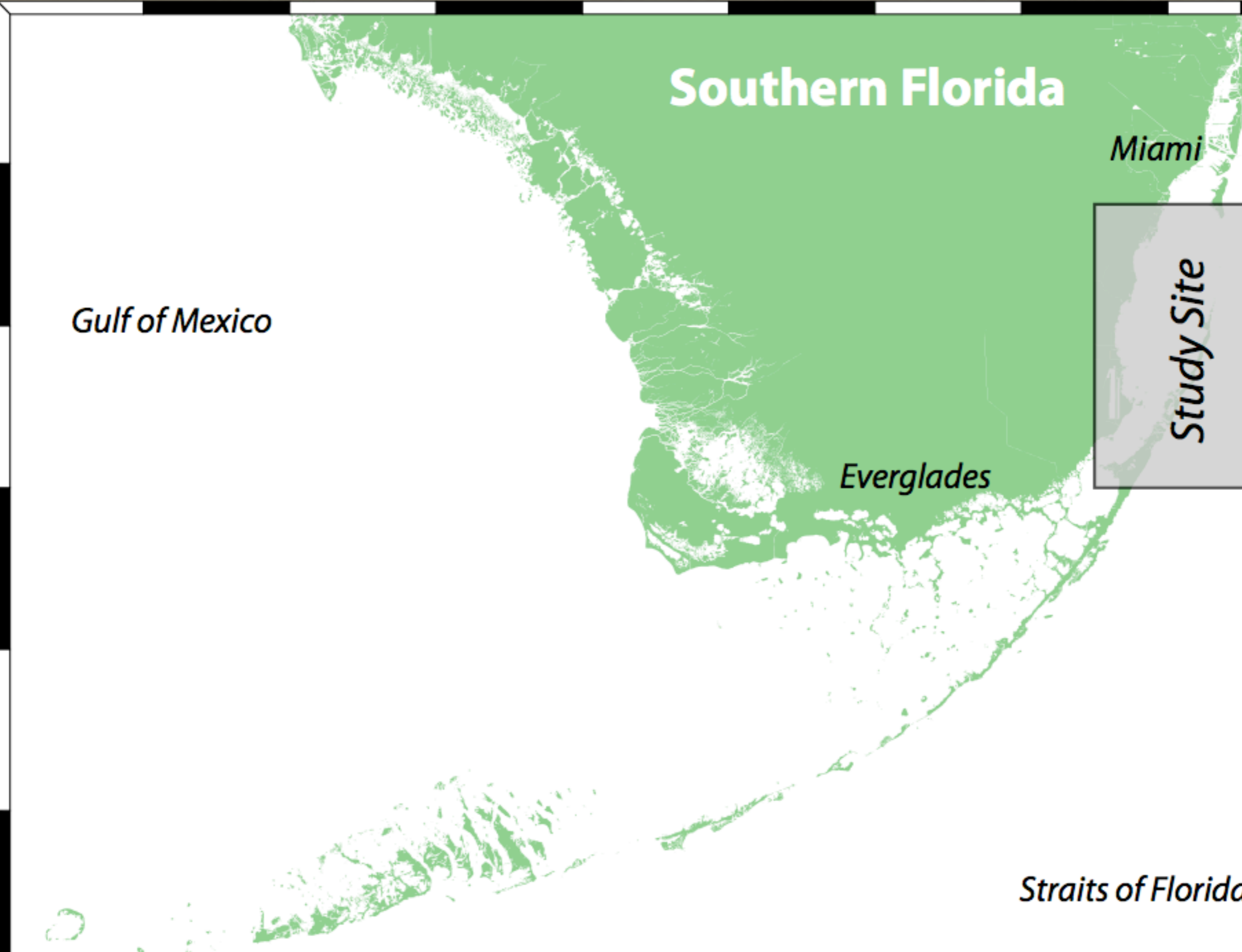
30'
15'

45'

81°15' W

45'

15'



Complementary Datasets

Mangrove Visual Survey (*J. Serafy*)

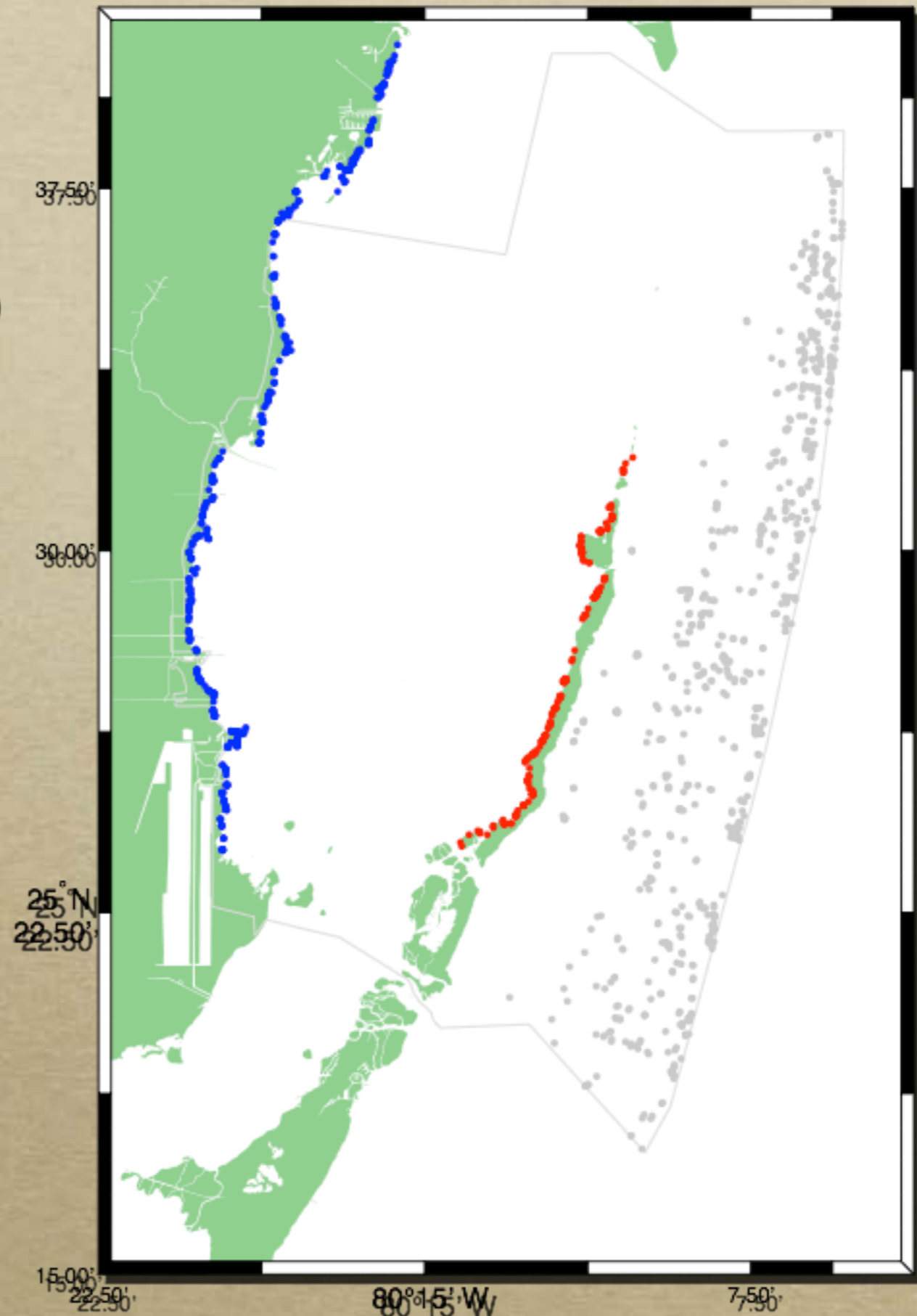
- 1999 - 2007 (~ 1000 transects)
- 99 taxa

Reef Visual Census (*J. Bohnsack*)

- 1999 - 2007 (~ 1000 surveys)
- 365 taxa

Mangrove/Reef = 68 taxa

- Abundance, Size
- Habitat, Environment

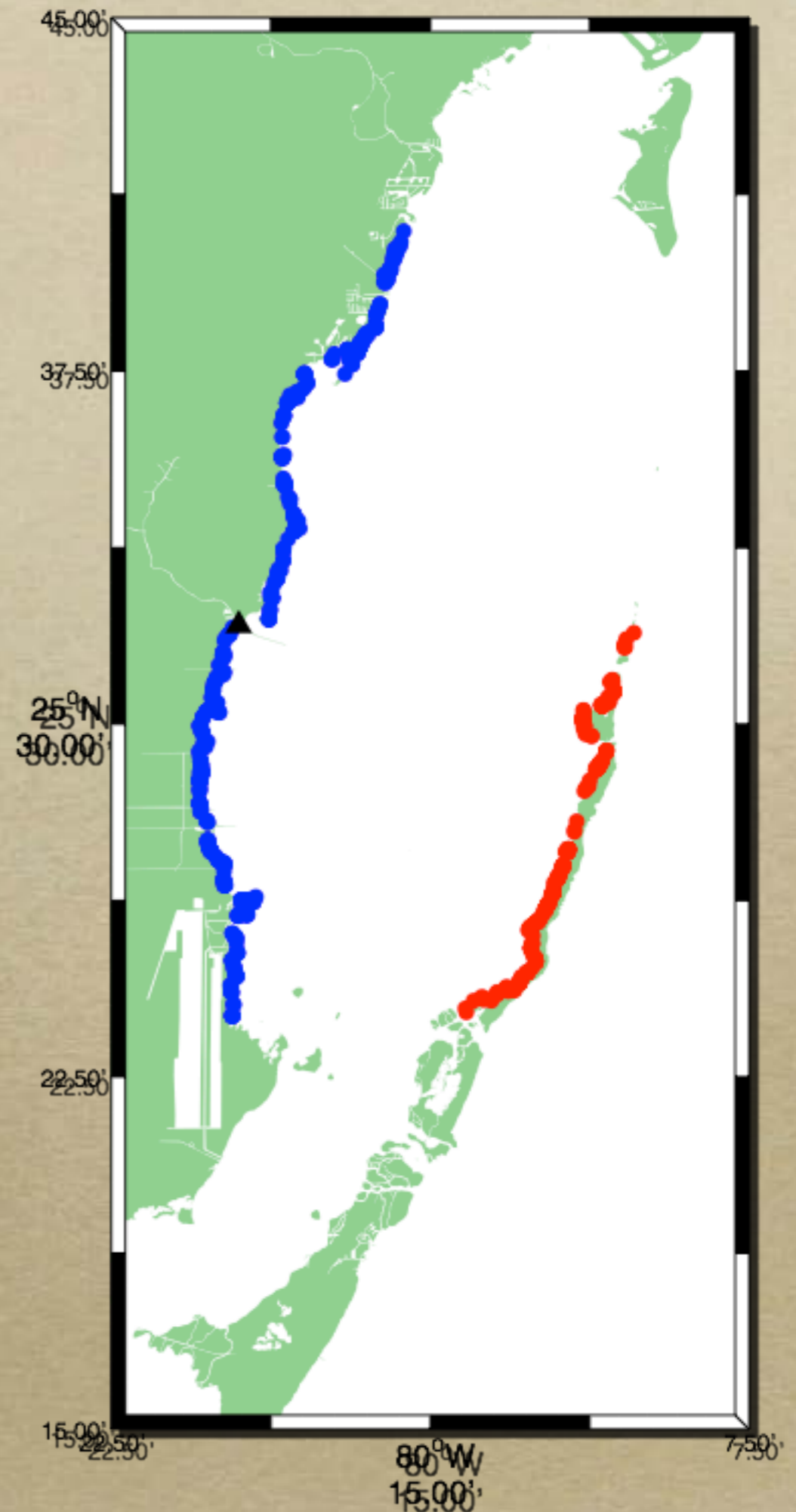




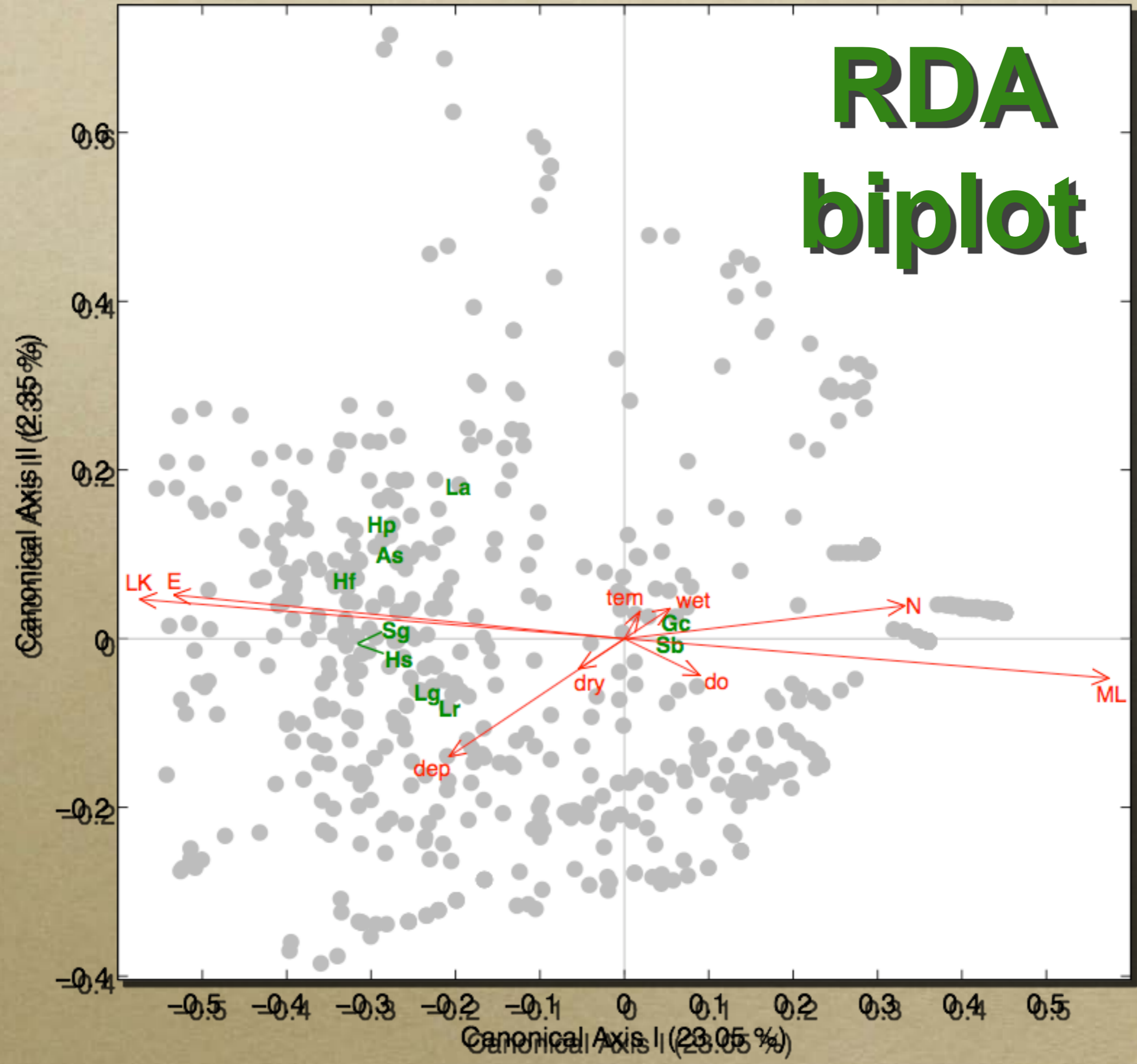
10 Indicator Species

Multivariate Analysis

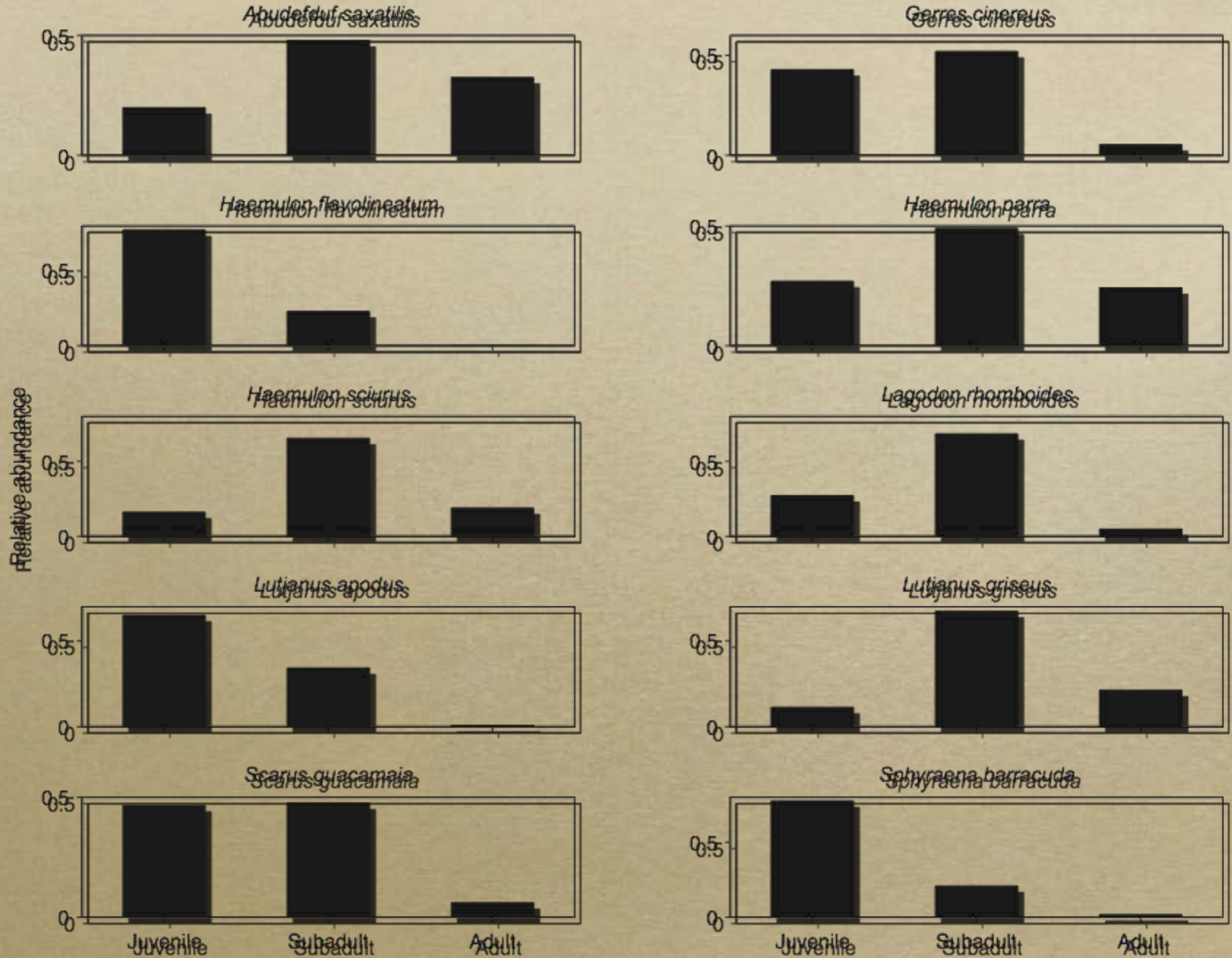
- Mangrove Fishes
- Annual Variability
- Environmental Influence
 - habitat
 - freshwater input
 - salinity
 - dissolved oxygen
 - latitude
 - depth
 - temperature
 - wet vs. dry season



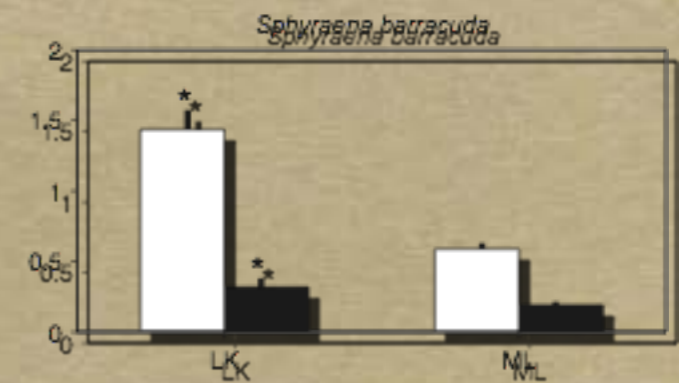
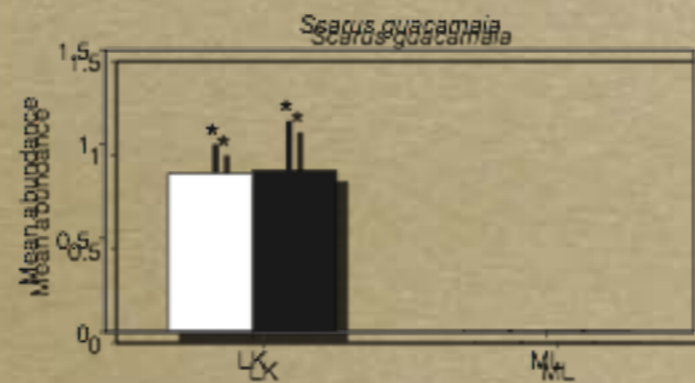
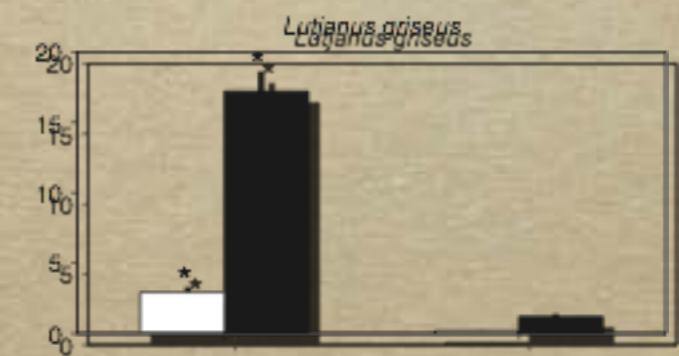
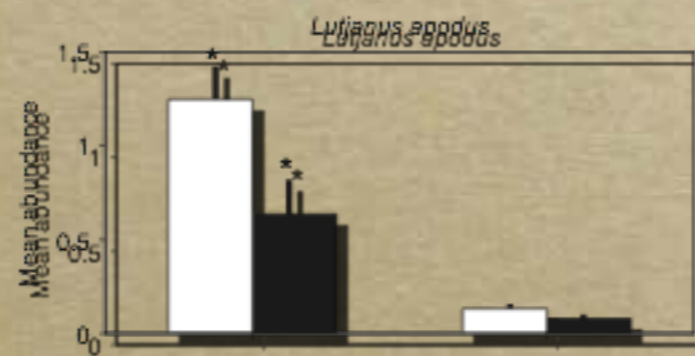
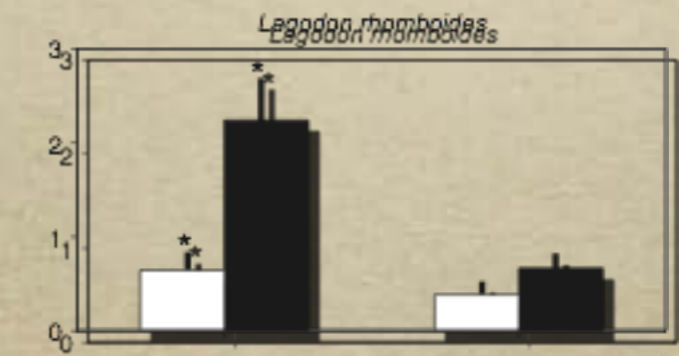
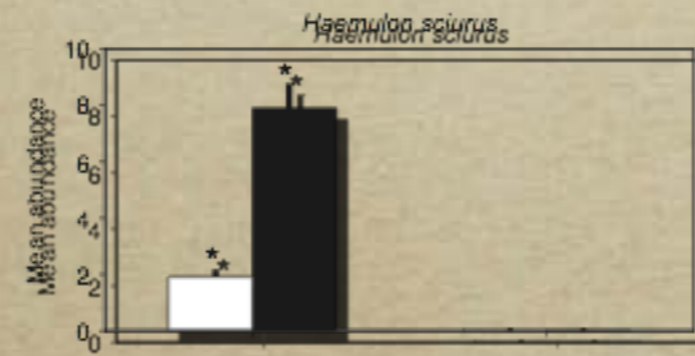
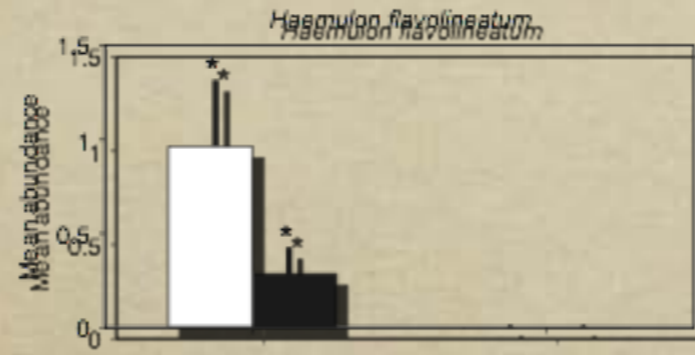
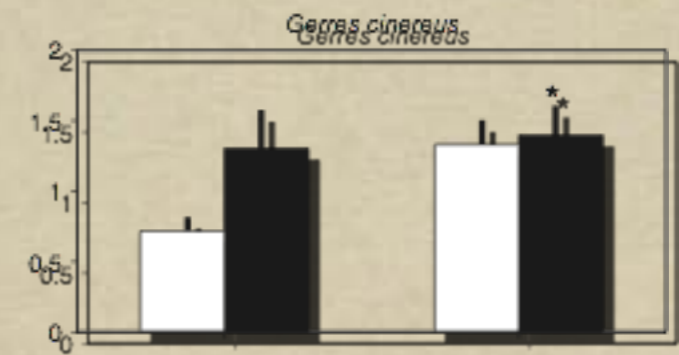
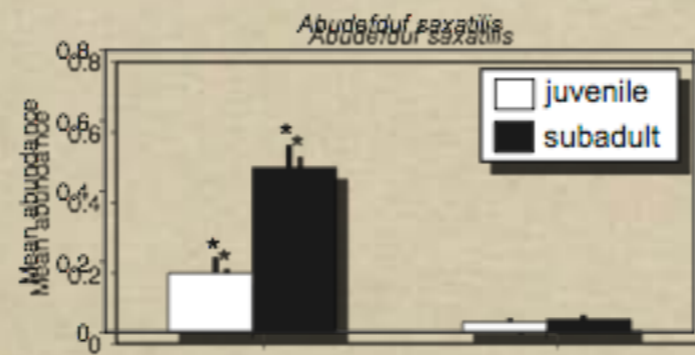
RDA biplot



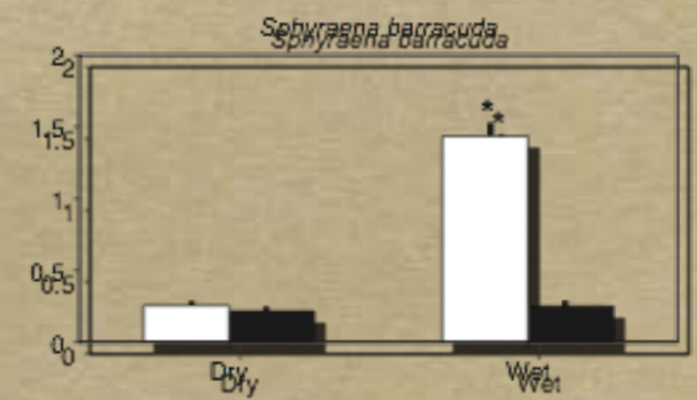
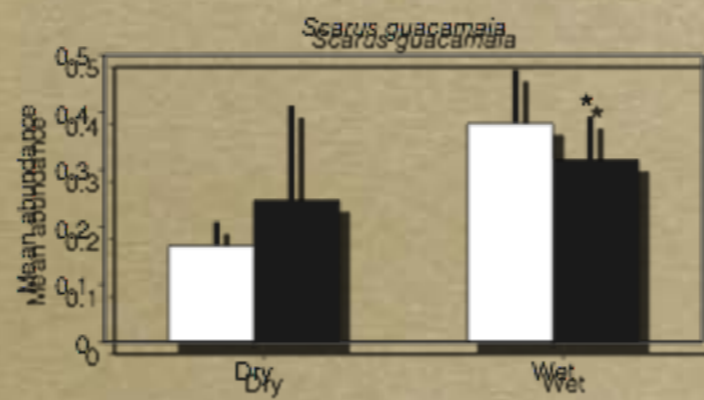
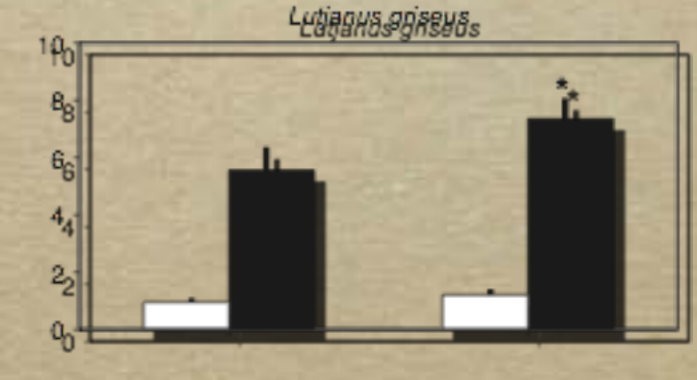
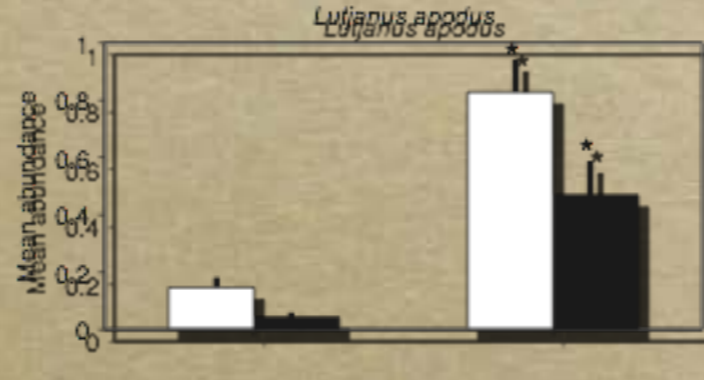
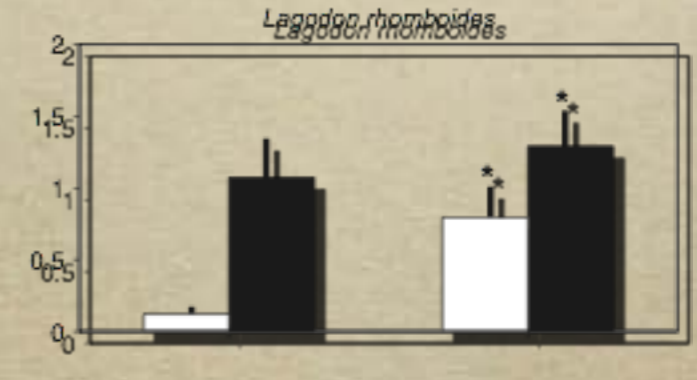
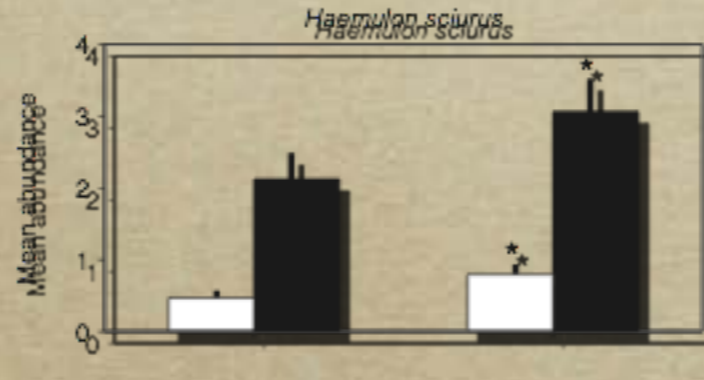
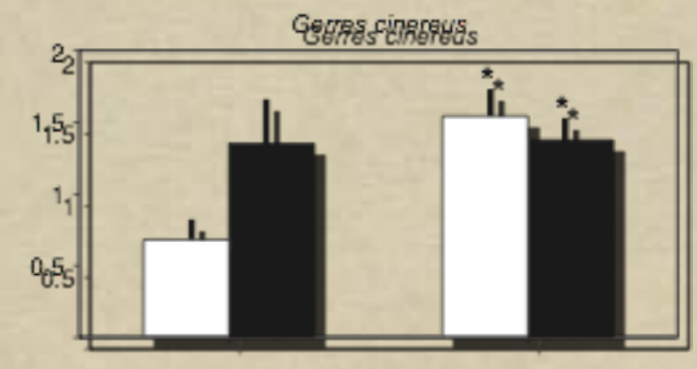
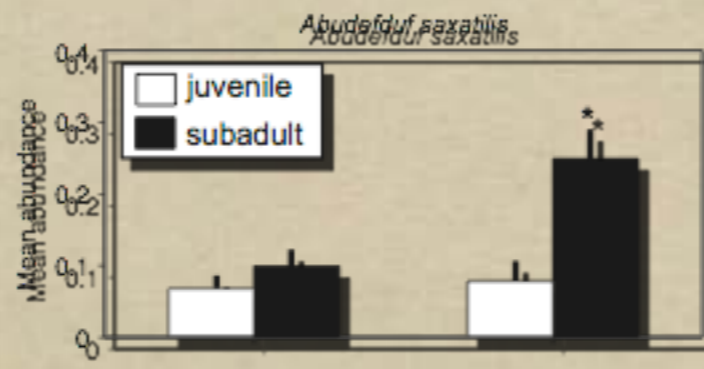
Developmental Stage

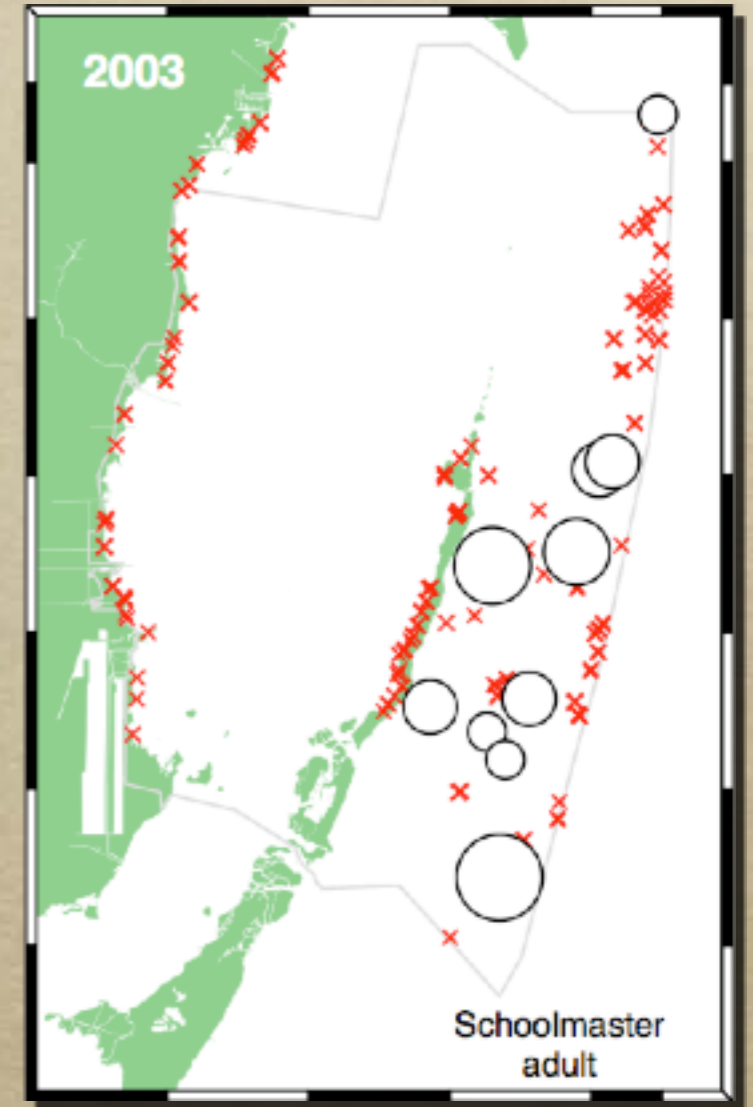


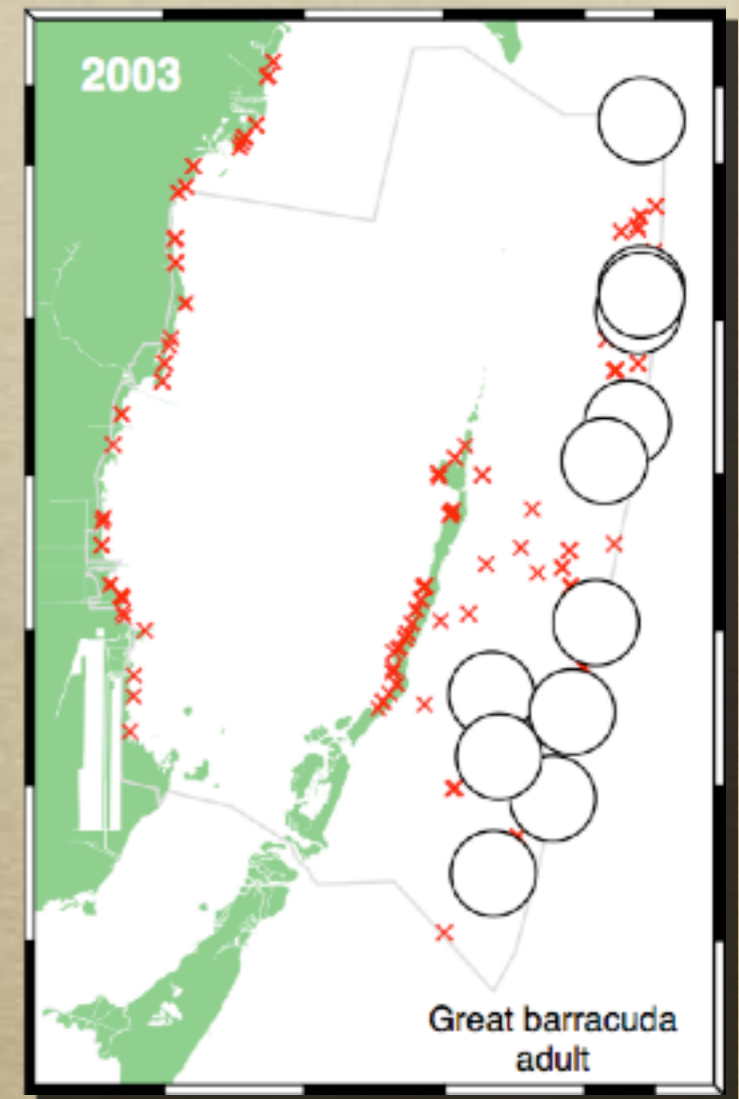
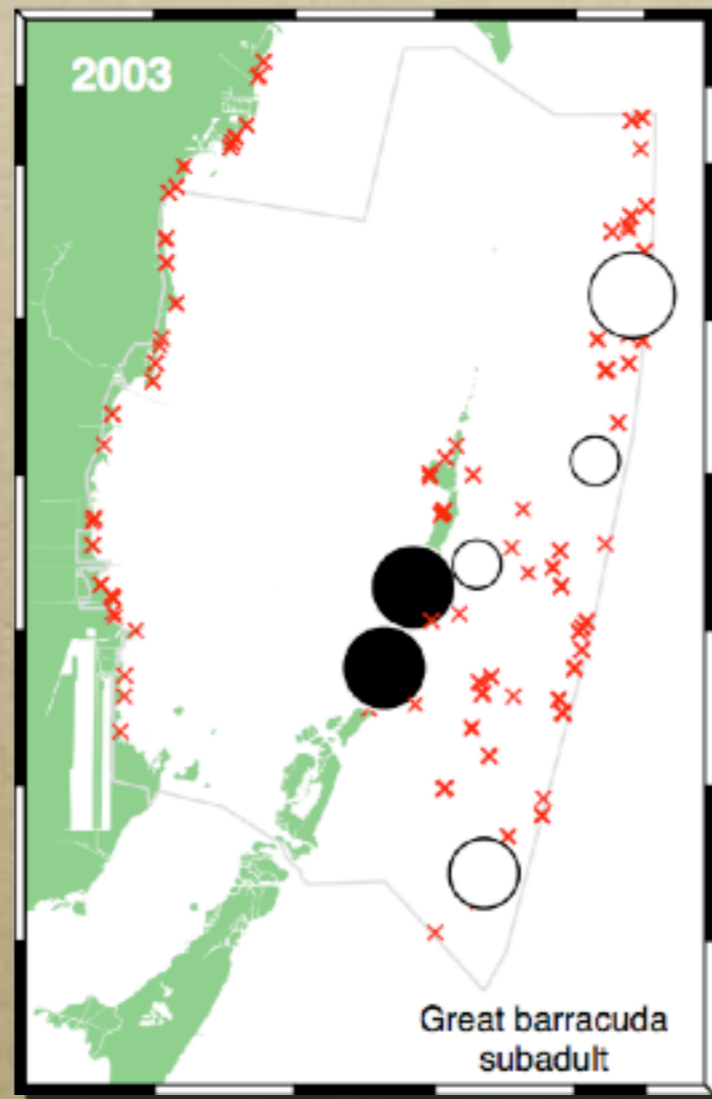
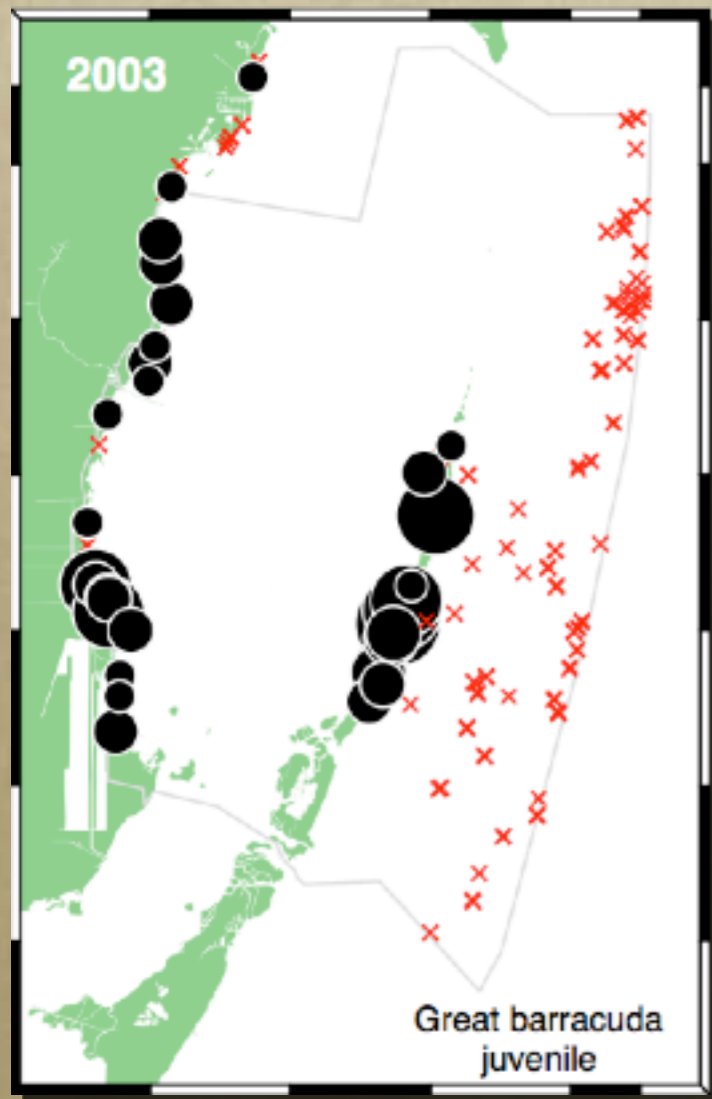
Habitat



Season







Ongoing Work

- Juvenile, Sub-adult, Adult
- Year-class
 - Gray Snapper
 - Bluestriped Grunt
- Cumulative freshwater input
- Index-of-Recruitment
- Reef data

Relevance

- **Critical Nursery Habitat**
- **Recruitment Dynamics**
 - **adaptive management**
 - **indices for stock assessment**
- **MPAs**