Insect and spider diversity in restored and natural saltwater marshes

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If they build it, will they come?

"Team Bug"

- This project is part of a larger project
- Hypotheses/Question: Are constructed marshes similar to control?
- How do insects/spiders change across a salinity gradient?


Mississippi
Louisiana

Study sites

Sites A & B are Created Marshes (2012-2015). Site C is the Control Marsh. Site 1 is low salinity site on a salinity gradient (next slide).

Study sites

Site 1 is low salinity site on a salinity gradient, 2 medium salinity, & 3 higher salinity. However, the siphon is OFF!

Site Description

- **Created** marshes are higher in elevation than controls
- Control marsh is wettest, most degraded site

- **Salinity gradient** due to a fresh water siphon
- Siphon was turned off in October 2017
- Site 1 changed from fresh water plants to salt water plants by May 2018 (7-8 months)

Project description

- Examine species composition, relative abundances, & food web structure at **created vs. natural marshes.**
- Examine species composition, relative abundances, & food web structure in natural marshes along a **salinity gradient**.
- In this presentation the focus is species composition and relative abundances.
- We are still sorting insects for the food web structure.

Methods:

- To quantify marsh terrestrial invertebrate abundance, we used sweep net along a 40m x 1m transect.
- At each site, 2 sweeps were conducted at each created and gradient site over 5 days (60 total).
- Organisms were separated from the dross, counted, identified.

Results

2018 total morphospecies = 96*

Total individuals = 6094

Created Marshes vs Natural

- Salinity Site A = 9.6 ppt
- Salinity Site B = 8.72
- Salinity Site C = 8.7

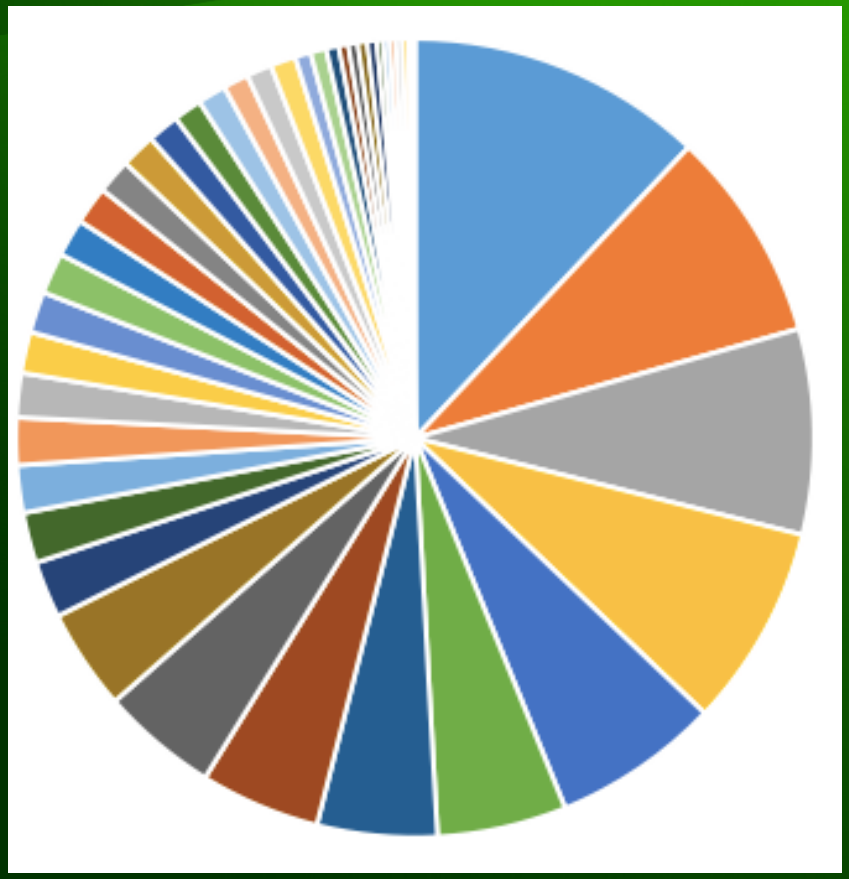
Salinity "Gradient"

- Salinity inland site "1" = 11.92 ppt
- Salinity intermediate "2" = 12.7
- Salinity high site "7" = 10.5

*To date

Constructed Marsh

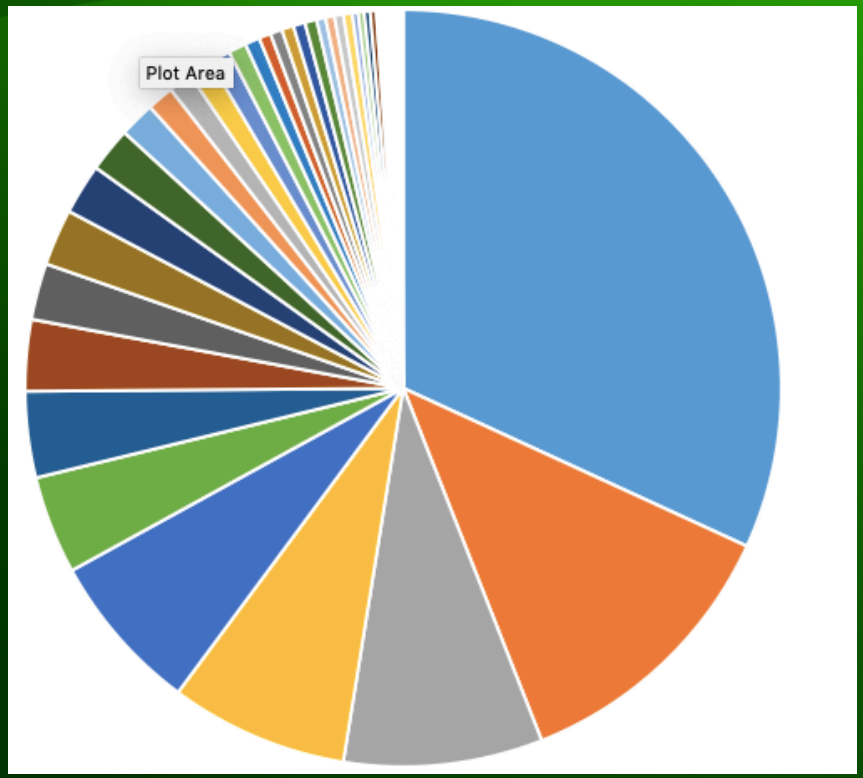
LHA



- Blue= Spiders
- Orange = Acrobat ants
- Herbivores
- Rare species
- 45 morpho species (except spiders) S = 45
- H’ = 1.39

Constructed Marsh

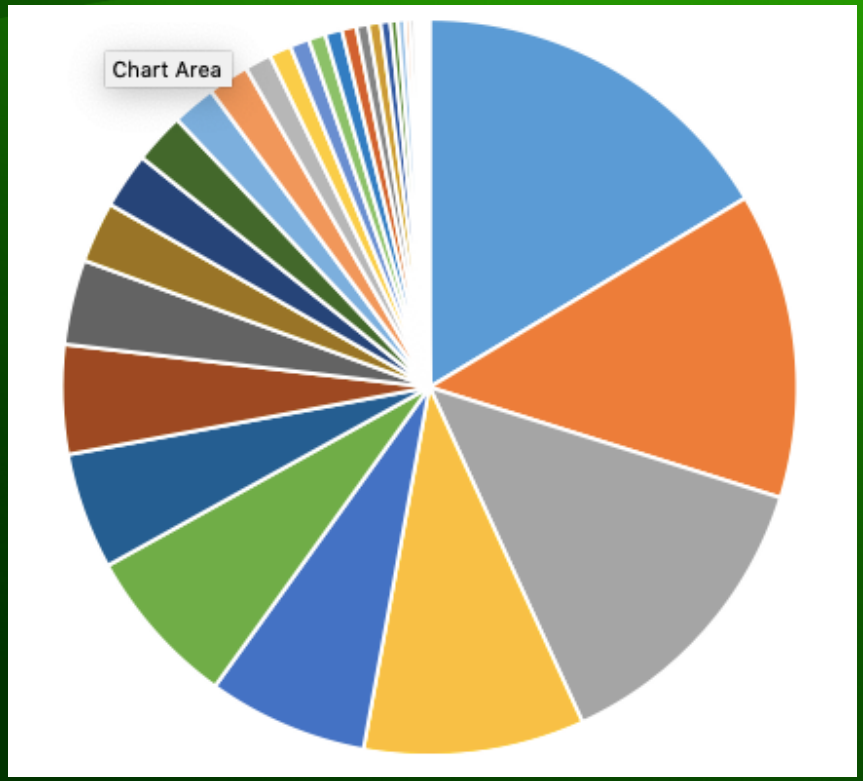
LHB



- Blue = *Prokelesia*
- Orange = *Incertella* (grass flies)
- Grey = Spiders
- Yellow = Acrobat ants
- Blue = *Ischnodemus* (cordgrass bug)
- Rare species
- 43 morpho species (except spiders)
- H’ = 1.12

Constructed Marsh

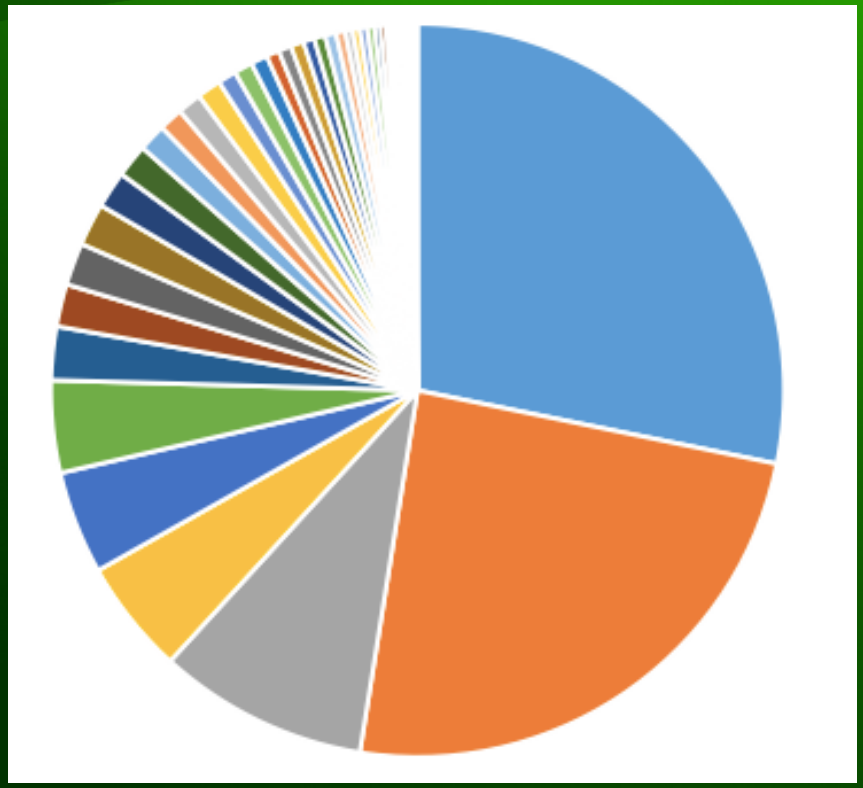
LHC



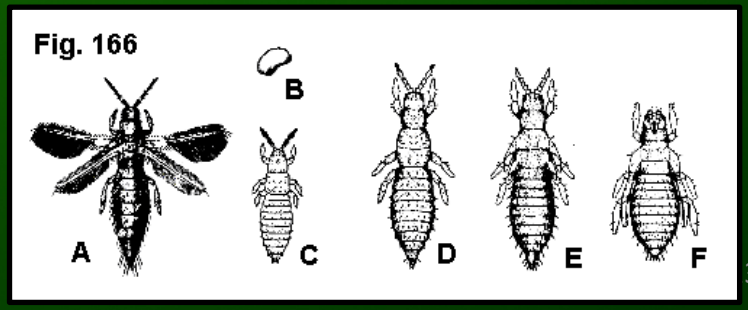
- Blue = *Prokelesia*
- Orange = Plant hoppers
- Grey = Acrobat ants
- Drk Red = Spiders
- Rare species
- 34 species (except spiders)
- H’ = 1.13

Salinity “Gradient”

PS 1 ”low”

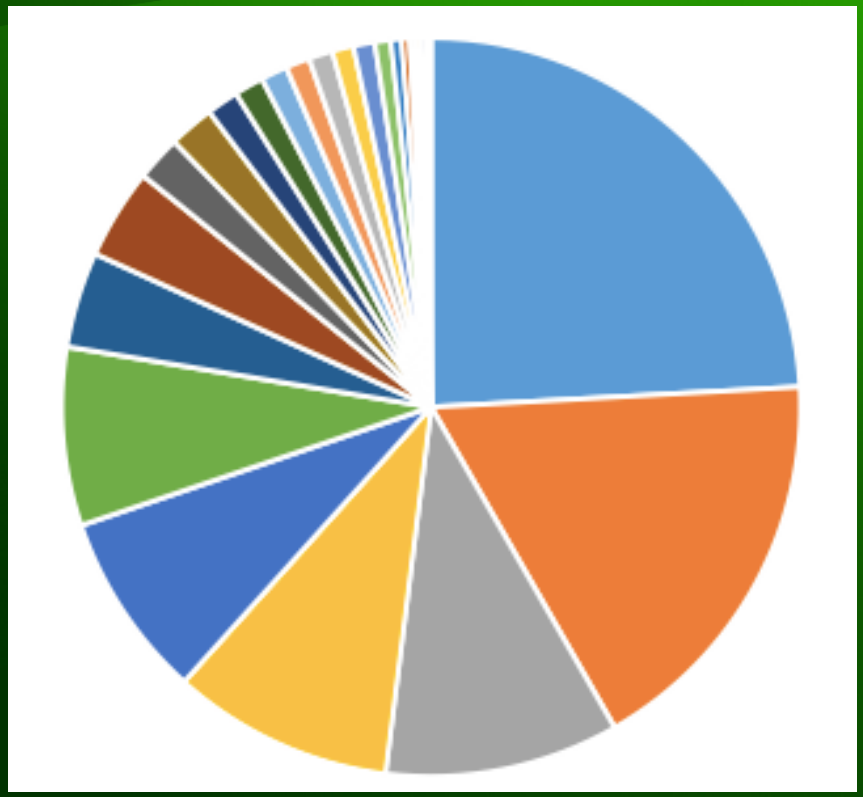


- Blue = *Incertella*
- Orange = *Prokelesia*
- Grey = Thrips
- Yellow = Spiders
- Rares
- S = 44
- H’ = 1.04



Salinity "Gradient"

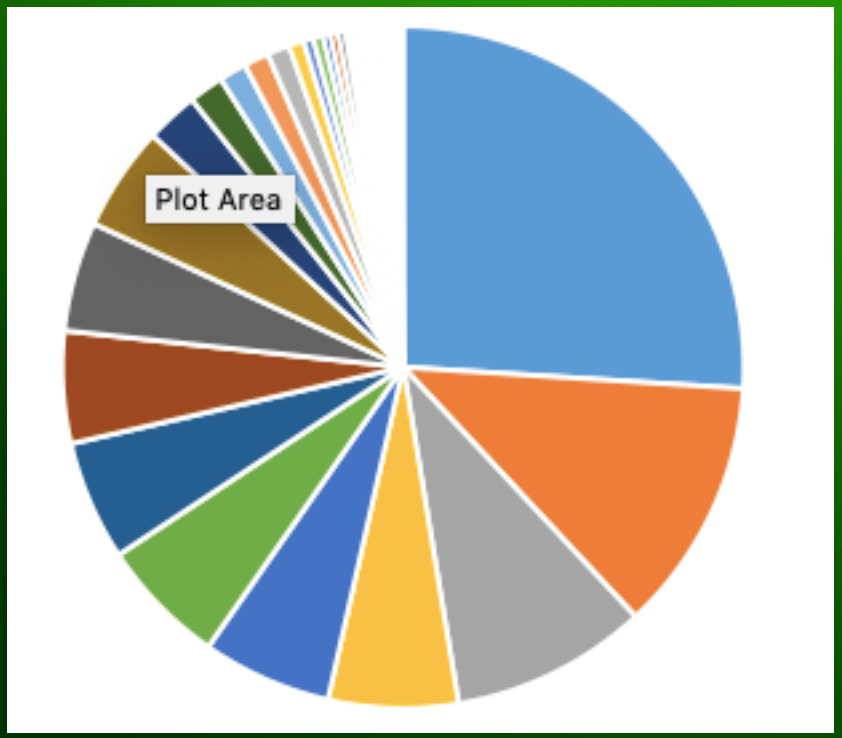
PS 2 "Mid"



- Blue = *Prokelesia*
- Orange = Acrobat ants
- Grey = *Chaetopsis* (PW Fly)
- Yellow = Dry twig ants
- S = 27
- H' = 1.04

Salinity “Gradient”

PS7 “High”



- Blue = Picture wing flies
- Orange = *Incertella*
- Grey = Green seed bugs
- Yellow = Ants
- Rares
- S = 37
- H’ = 1.13

Ants

Created Marshes vs Natural

	LHA	LHB	LHC
Acrobat Ants	67	60	91
Dry Twig Ants	13	0	7

Salinity "Gradient"

	PS 1	PS 2	PS 7
Acrobat Ants	***13	151	68
Dry Twig Ants	***4	83	57

Dominant Herbivores

Created Marshes vs Natural

	LHA	LHB	LHC
Green Seed bugs	4	33	23
Incertella (grass flies)	38	96	48
Prokelesia	41	251	154
Cordgrass bugs	0	54	21

Salinity "Gradient"

	PS 1	PS 2	PS 7
Green Seed bugs	7	17	79
Incertella	340	64	102
Prokelesia	299	194	48
Cordgrass bugs	23	24	51

Concluding remarks

Constructed Marshes

- Whereas this study of the populations and communities is interesting on its own, the combination with the other aspects of the project will make the results more relevant and interesting.

Salinity

- Obviously we are going to be very interested in the system when the siphon comes back on.
- The isotope data for the insects and possible changes as salinity changes will be of interest.

Photos: My own; Bug Guide

Thank you!

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