

01/17/24



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FLORIDA SEA GRANT'S 2024 SYMPOSIUM: SPOTLIGHTING UF'S ROLE

Session VI Graduate Fellows

Hayley Lemoine

FSG Aquaculture Outreach & Communications Fellow
PhD Geography, FSU

Examining the social acceptability of aquaculture in the U.S.

Hayley Lemoine | PhD candidate in Geography at Florida State University,
Florida Sea Grant Aquaculture Communications and Outreach Graduate Fellow
Dr. Laura Tiu | FSG Extension Agent and CED, Walton County



Part I: RESEARCH



Use participatory methods to examine the social acceptability of aquaculture, focusing on offshore aquaculture, in coastal communities across the US

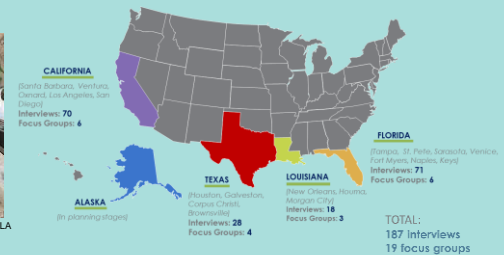


Abalone farmer, CA



Seafood market, LA

Recreational fisherman, TX



Part II: Outreach



Women of the Water:

Planning committee, mentorship sub-committee

Aquaculture America:

HARVEST internship 2023, FSG Fellowship 2024
(come see my talk!)

AOA Siting Workshop (Violet Louisiana, 2023)

Organizer, panelist



"Aquacurrious" blog series:

Important, relevant and/or popular topics related to aquaculture, focusing on offshore, in the U.S.



(HUGE) THANK YOU!

Dr. Sherry Larkin, Dr. Laura Tiu +
FLORIDA SEA GRANT

Dr. Sarah Lester +
FLORIDA STATE UNIVERSITY

Dr. Adriane Michaelis +
ECS Tech Consulting

Dr. Matthew McPherson +
NOAA SEFSC

Dennis Peters +
Ocean Era, Inc.



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NOAA

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Recruitment and Trophic Dynamics of Range-Expanding Snook

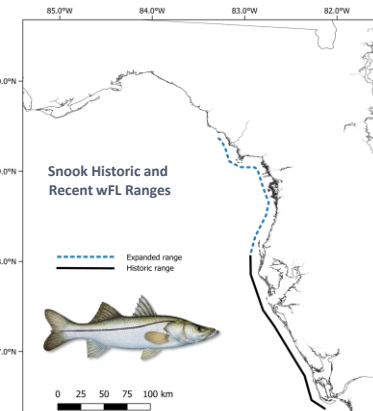
Jordan Bajema

PhD Student
School of Natural Resources and Environment
Supervisor: Will Patterson, Marine Fisheries Lab

Project Overview

Introduction

- Thermally limited species expanding ranges under climate change
- Common snook range expansion along west FL
- FL Sea Grant funded studies:
 - Recruitment dynamics
 - Trophic dynamics



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Project Overview

Recruitment Dynamics

Objectives

- Derive natural tags using $\delta^{13}\text{C}$ $\delta^{18}\text{O}$ signatures in age-0 snook otoliths
- Use these tags to estimate natal estuary of age-1+ snook caught in the Nature Coast region
- Estimate proportion of local recruitment within the Nature Coast region and how it has changed over time



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Project Overview

Recruitment Dynamics

Outcomes

- Successfully derived natural tags
- Estimated the natal estuary of recently recruited snook
- Approximately 45% of the 2016 year-class was locally recruited
- Approximately 75% of the 2019 year-class was locally recruited
- Paper in progress



Telemetry data indicate low survival the previous winter

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Project Overview

Trophic Dynamics

Objectives

- Compare diet of snook, red drum, and spotted seatrout in the Nature Coast region
- Increase diet resolution using DNA Barcoding
- Test for competition between the three species
- Look for evidence of direct consumption of red drum and spotted seatrout by snook



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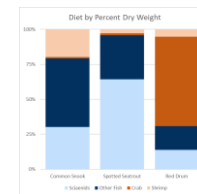
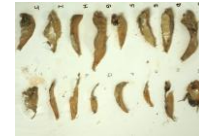
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Project Overview

Trophic Dynamics

Outcomes

- DNA barcoding reduced the number of unidentifiable fish by 77%, 25 new species and genera identified
- Snook and seatrout have very similar diet, consuming primarily fish
- Evidence of direct consumption of red drum and spotted seatrout by snook
- Presentation at Latin America and Caribbean Fisheries Congress, paper in progress



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Acknowledgements & Next Steps

Sampling assistance: Jenny Miller, Johnny Polasik, Keel Condy, Miaya Taylor, Shea Husband, Stephanie Winn, and Victoria Odena

Coauthors: Mike Allen, Brian Klimek, Caleb Purtlebaugh, and Will Patterson

This experience has solidified my desire to continue working to understand the ecology of range-shifting species in the face of climate change



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Effects of seagrass species diversity on ecosystem stability and biogeochemical functioning

Alexandra Bijak, PhD Candidate
Reynolds Coastal and Marine Ecology Lab & Smyth Biogeochemistry Lab
Department of Soil, Water, and Ecosystem Sciences, University of Florida

PROJECT OVERVIEW

Dissertation goals:

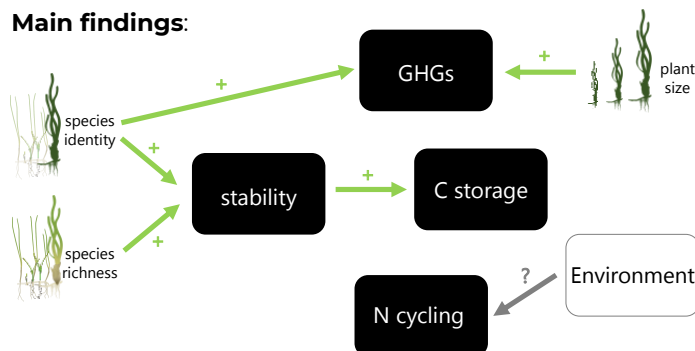
Use biodiversity theory to understand ecosystem functions and services and what drives their variability in subtropical, mixed species seagrass meadows

- Stability
- C storage
- GHGs emissions
- N cycling



PROJECT OVERVIEW

Main findings:



PROJECT OVERVIEW

Fellowship goals:

Disseminate research findings to scientific community, coastal resource managers, and students

Progress:

1. Presentations at national/int'l conferences
 - Presented at BEM '23 & CERF '23
2. Open access publications in peer-reviewed journals
 - Published C storage work in Landscape Ecology
3. EDIS documents:
 - What is Blue Carbon? (*in prep*)
 - Linking Waterbody Acidification and Plant Metabolism: A lesson plan for Middle School Students (*accepted*)

ACKNOWLEDGEMENTS & NEXT STEPS

Acknowledgements:

- Reynolds & Smyth lab members
- Dr. Savanna C. Barry, Ashley M. McDonald, Dr. Willm Martens-Habbena
- Committee members: Dr. Charlie Martin, Dr. Julie Meyer
- Nature Coast Biological Station, Wetland Biogeochemistry Lab, Light Stable Isotope Mass Spec Lab, Environmental Pedology and Land Use Lab

Next steps:



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Graduate Fellows
By Perez



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Bivalve Ecosystem Services and the Nitrogen Cycle:

In Situ Filtration and the Role of Natural Seston and Inundation Times

Kristie Surdacki Perez

PhD Student
School of Natural Resources and Environment

Advised by Dr. Shirley Baker
Invertebrate Biology Lab
Fisheries and Aquatic Sciences

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Introduction

GUANA NUTRIENTS BUDGETS & BIVALVES

Examine feedbacks between bivalves and water quality and differences between the local species

Quantify the role of the local bivalves the Nitrogen Cycle (toward overall nitrogen budget)

- Filtration (clearance) rates
- Ammonium excretion rates
- Seston to sediment carbon / nitrogen transport rates
- Biodeposition rates

Natural process

Laboratory experiment

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Overview

Use of the fellowship to address gaps identified in literature...

"Reliable" Data

- Subject of considerable debate
- Monoculture vs. Natural Seston
- Typical studies
- Extrapolating results

Environmental Relevance

- Seston composition
- Including phytoplankton constituency
- Flow rates
- Other regionally relevant factors

PILOT FILTRATION STUDIES

Confirming and refining selected methods

STUDY OF ENVIRONMENTAL CONDITIONS

Ensuring environmental relevance

Under Fellowship

LABORATORY STUDIES

Collecting data to answer project research questions

IN SITU STUDY

Exploring the relationship between lab and field studies

Under Fellowship

EVALUATION OF RESULTS

Providing regional rates for bivalve estuary services

Objectives / Status

1. SPATIOTEMPORAL COMPOSITION OF SESTON

Data Analysis

2. SPATIOTEMPORAL PHYTOPLANKTON CONSTITUENCY

Data Validation

3. IN SITU BIVALVE FILTRATION RATES

Data Collection

4. CALIBRATE RESULTS WITH LAB STUDY

Planned

5. CREATE A STORYBOARD TO SHARE

Planned

May 2024

June 2024

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Acknowledgements

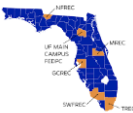


Special thanks to:


Dr. Nikki Dix and others who work at the Guana Tolomato Matanzas Research Reserve who helped organize and facilitate the activities under this project

Dr. Todd Osbourne at the UF Whitney Lab for his ongoing support

PhD Student Justina Dacey and Dr. Ashley Smyth from the UF Tropical Research and Education Center for their participation in the project

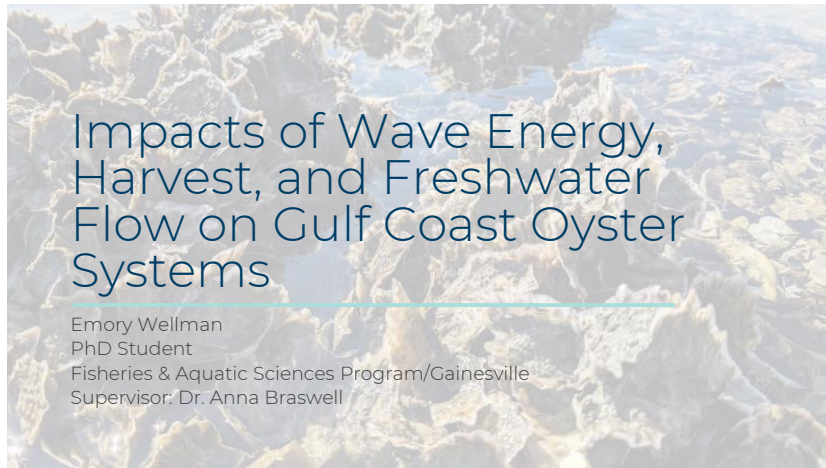
Florida Sea Grant, for the funding which made this research possible





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PROJECT OVERVIEW

OBJECTIVES:

- Survey environmental conditions in oyster habitats across gradients of harvest, wave energy, and salinity; determine oyster biomass; identify relationships between oyster success and these drivers.



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IMPORTANCE:

- Novelty: Link oyster habitat structure to wave energy.
- Alternative stable state theory – are “clumps” a transition between stable systems (reef and shell)?



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IN PROGRESS:

- 2 of 3 wave gauge deployments complete.
- Drone surveys/image analysis, oyster sampling in Feb. & March 2024.



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RAMIFICATIONS:

- Remote sensing workflow for oyster mapping
- Use in management – improve existing oyster inventory methods (OIMMP)



ACKNOWLEDGEMENTS

Huge thanks to...

- FSG faculty (M. Clark, A. Braswell)
- UF undergraduates (K. Hollis, G. Hejmanowski)
- NCBS staff (E. Hernandez, K. McCain)
- LSWR and FWC partners (A. Gude, T. Kirkland)

NEXT STEPS

- Already had a strong interest in working for Sea Grant or a state/federal agency – my experience with this project has further strengthened it!

