

 Grimes Lab, University of the Virgin Islands

# GRROE USVI Mangroves



**Growing Research, Restoration, Outreach  
and Education of USVI Mangroves**

**Kristin Grimes, Allie Durdall, Sierrah Mueller, Laura Bloem  
University of the Virgin Islands**

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**NOAA in the Caribbean Annual Partners Meeting**



# GRROE USVI Mangroves

## RESEARCH



- Territorial Mangrove Monitoring Program (TMMP)
- Blue Carbon Analyses
- Marine Debris x Mangroves Research

## RESTORATION



- Land-based nursery
- Survival and growth experiments
- Learning exchanges

## OUTREACH



- Community workshops
- Mangrove perceptions research
- Community cleanups and outplanting

## EDUCATION



- Mangroves in the Classroom Program
- Student training opportunities
- USVI Storm Strong Program



**Great Pond, St. Croix**



# TMMMP

Territorial Mangrove Monitoring Program

GOAL: Provide a baseline of mangrove forest health in the U.S. Virgin Islands to inform management and restoration, and over time, assess temporal forest trends.

- Established in 2021
  - Annual monitoring
  - 19 sites across 3 islands
- Train UVI undergraduate and graduate students
- Data collection: follows USGS forestry methods, plus more!

# TMMP Data

## Adult Forest Metrics

Diameter at breast height, species, health, phenology & height



Canopy coverage



Trees are mapped within the plot and sometimes tagged for repeat measurement



## Regeneration Metrics

Four 1 m<sup>2</sup> quadrats set at cardinal directions from plot center



Propagules, & seedlings are noted, saplings are measured.

## Environmental Metrics

Blue Carbon & soil characteristics



Water quality



Woody debris



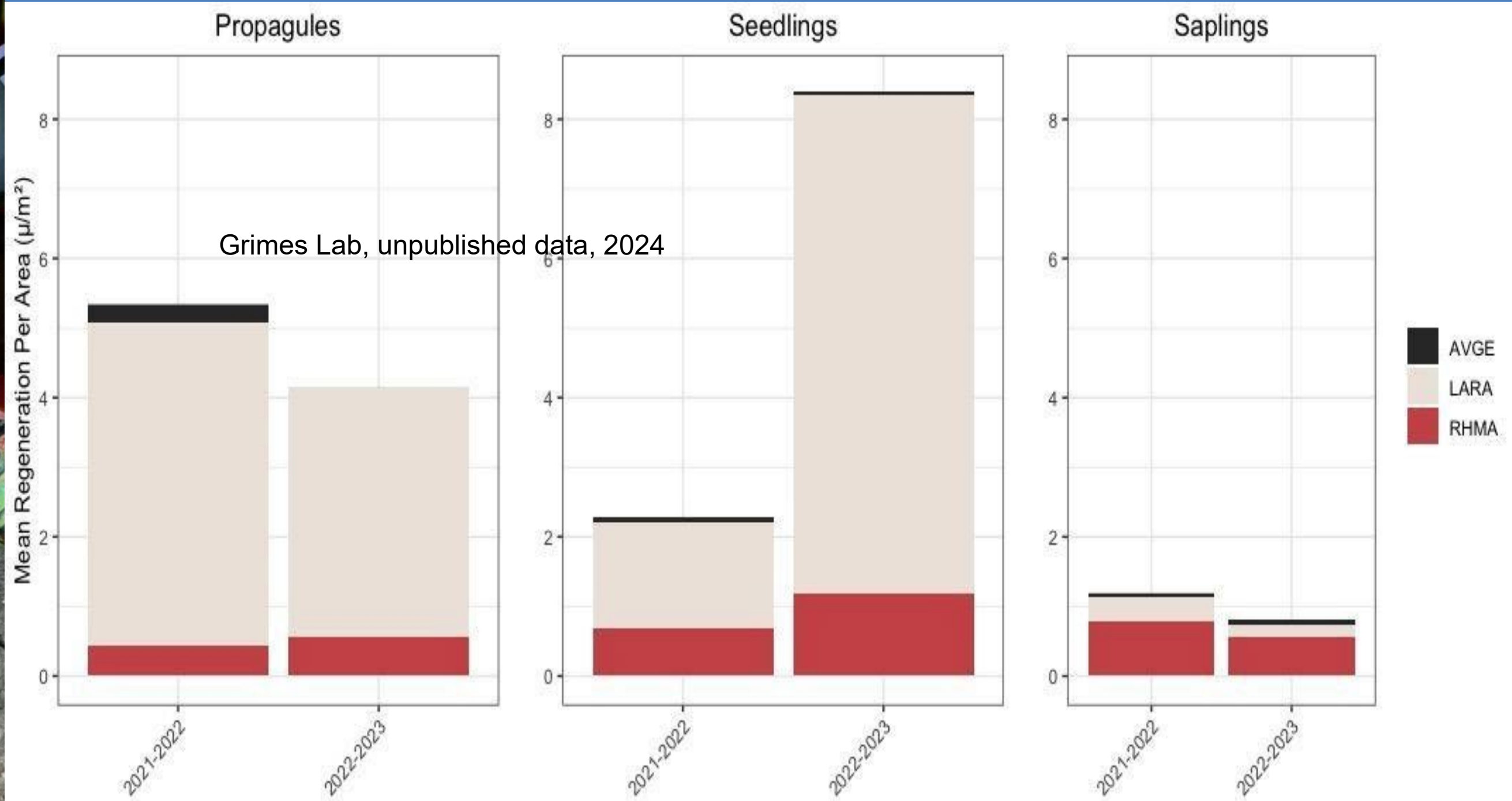
Groundwater Temperature & light

## Ecological Observations

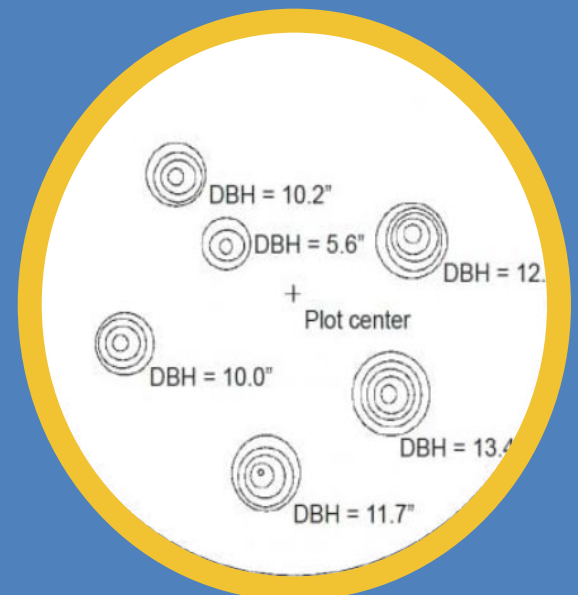
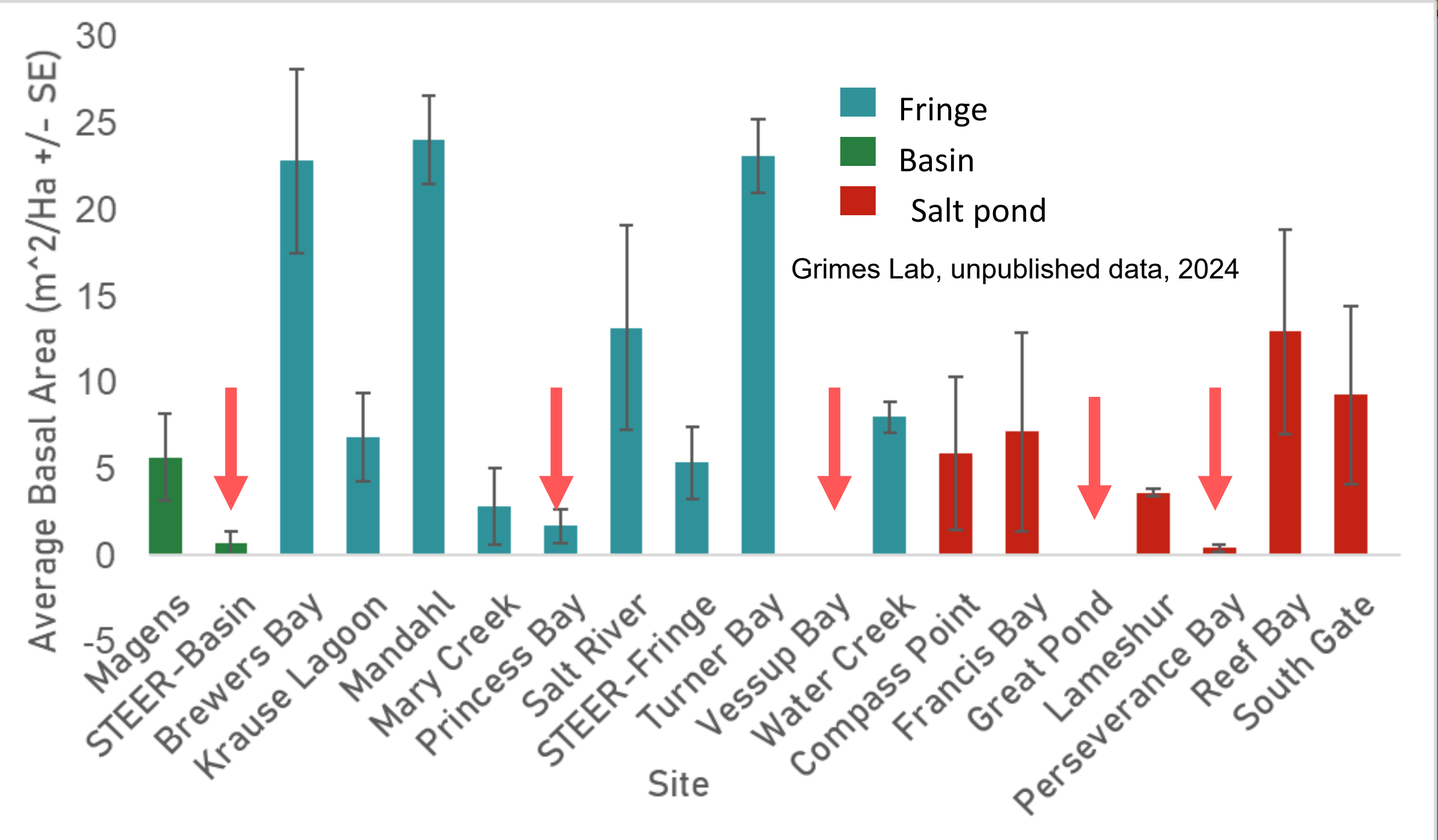
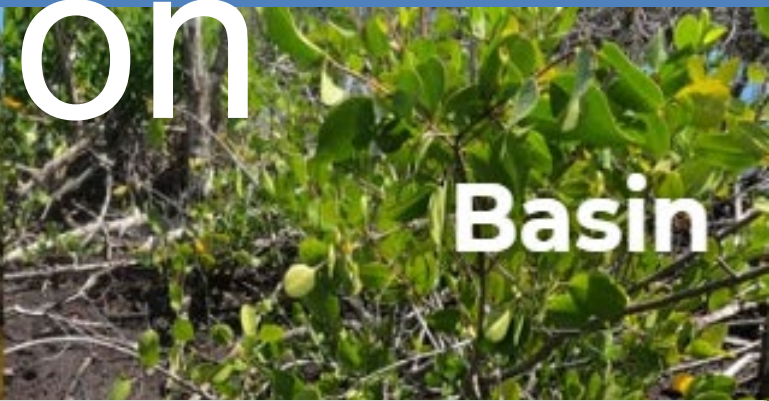
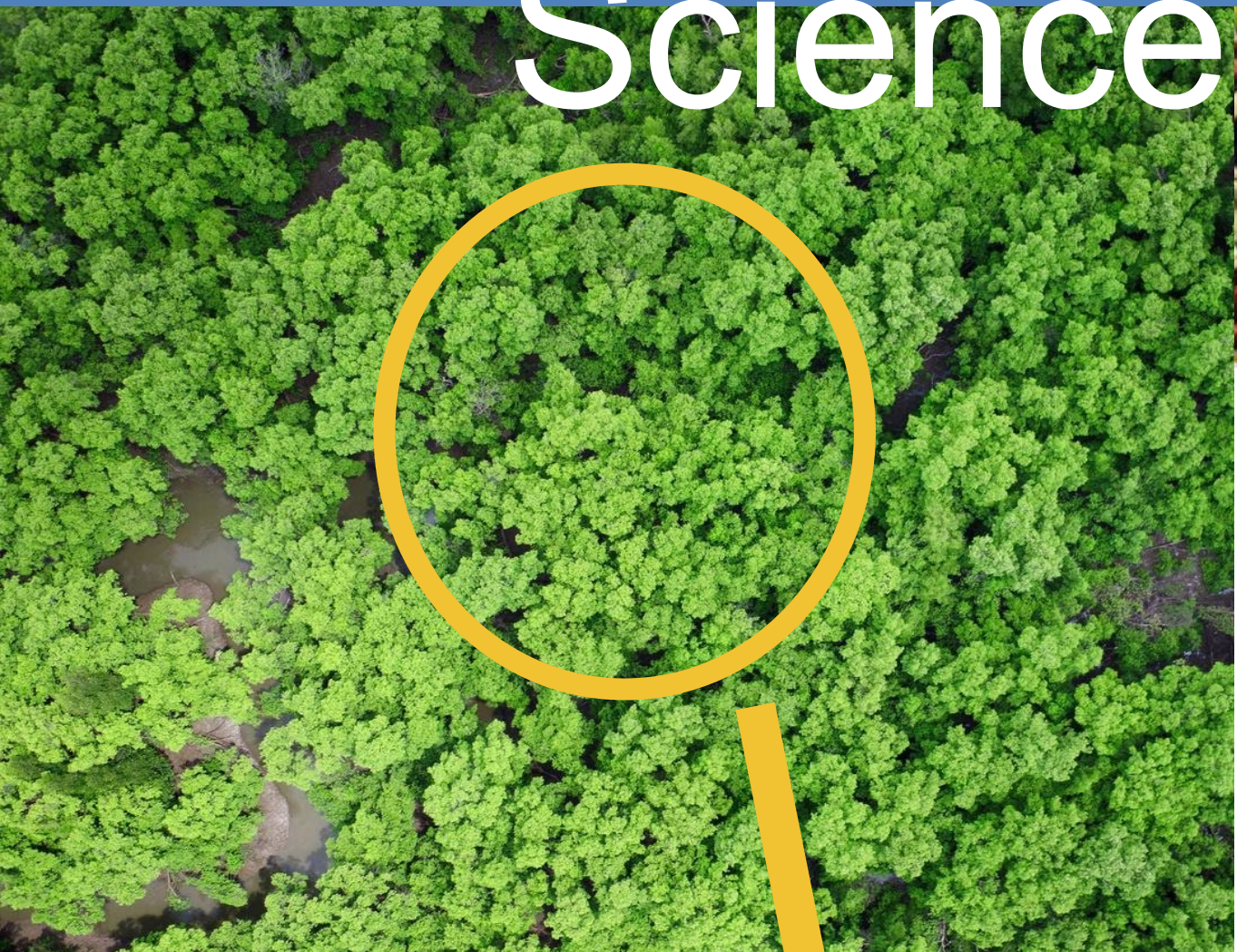
What species are present in the plot? (pests too!)



# Science Guides Restoration



# Science Guides Restoration



# Community Guides Restoration



- Virtual and in-person workshops: co-created shared visioning for territorial mangrove restoration



# Mangrove Nursery

- Growing all 3 species: red, black, and white mangroves. Capacity of ~5,000 trees
- Data collection
  - **Phenology data:** when trees are flowering or producing propagules
  - **Intake:** collection site, propagule size, condition, etc.
  - **General monitoring:** height, number of leaves, condition, etc.
- **Nursery Experiments**
- Train students and community volunteers



# Nursery Experiments

RESTORATION

RESEARCH



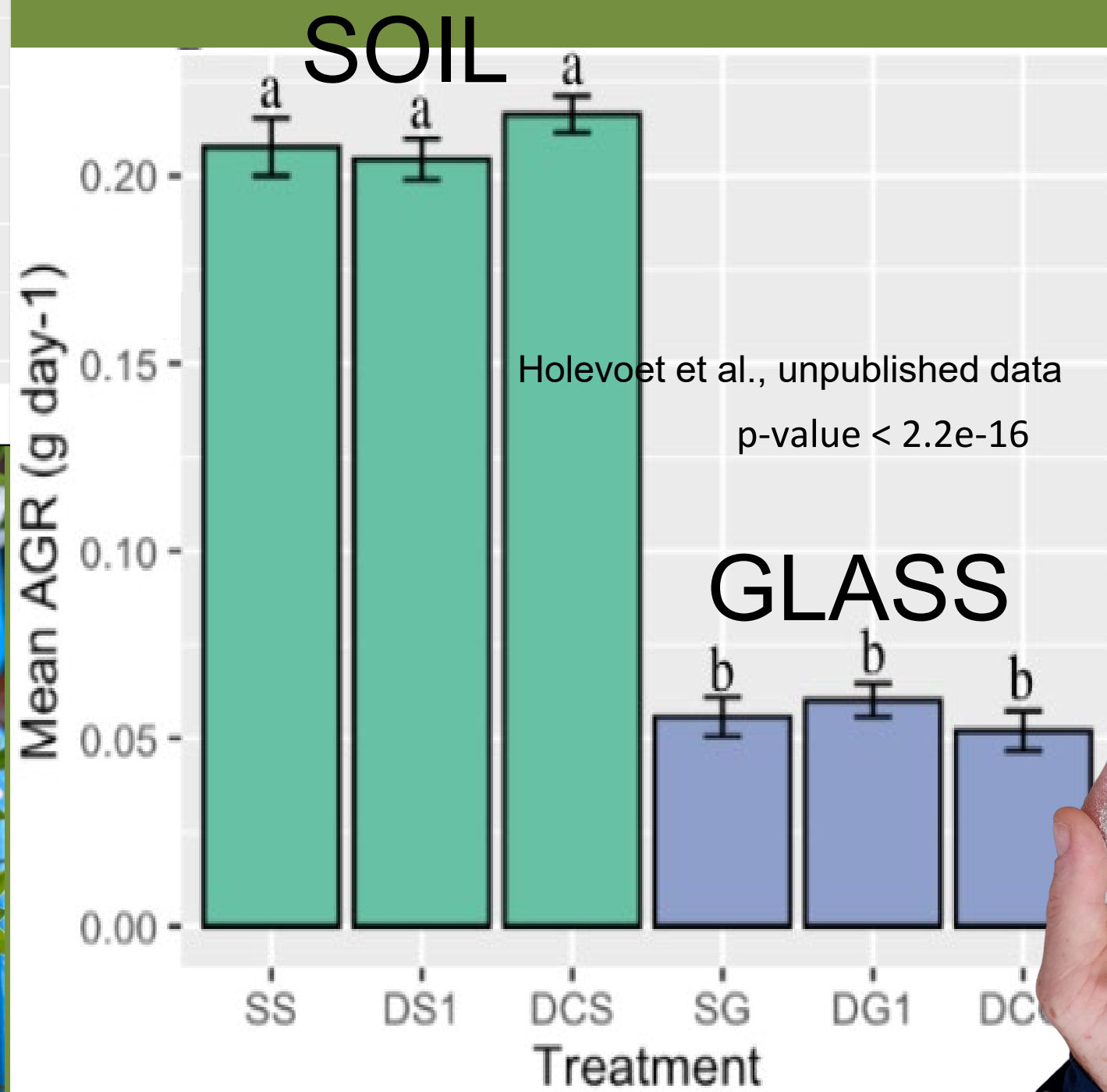
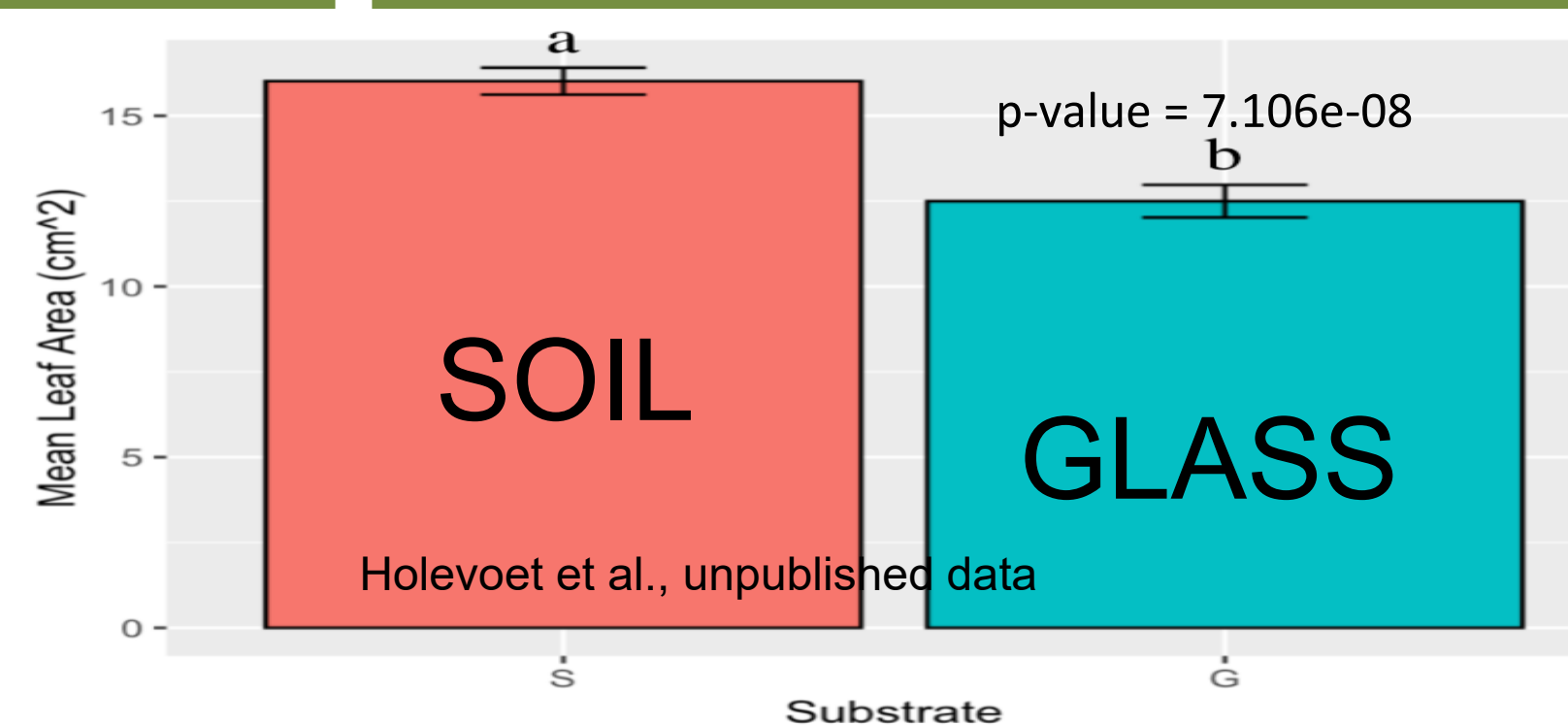
• 98% (472/480) survived!

2 in soil died

6 in glass died

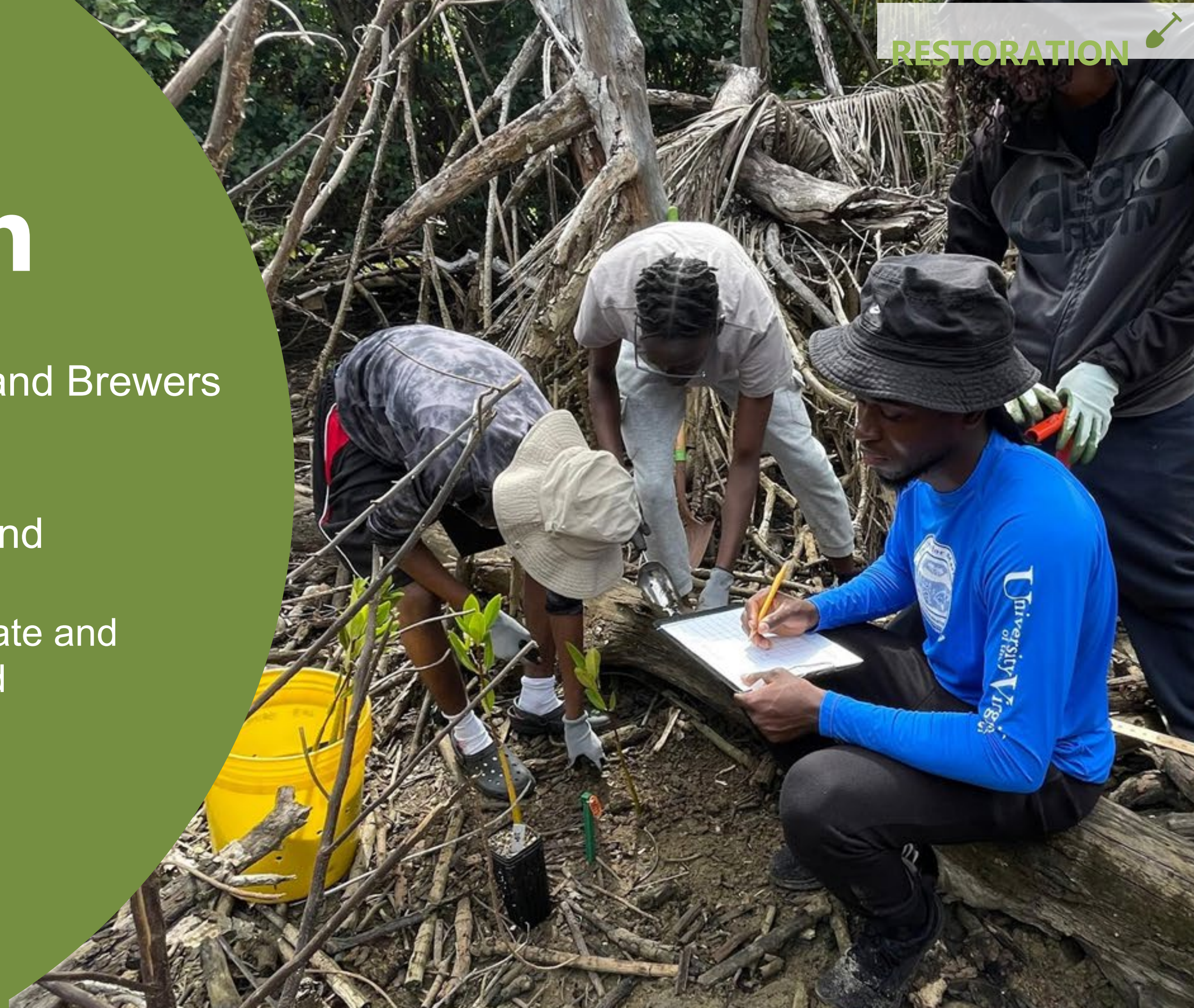


Allison Holevoet  
Master's Thesis



# Restoration

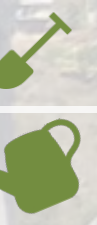
- Started in Dec 2022
- St. Thomas: Hull Bay and Brewers Bay
- St. Croix: Salt River
- 2,000+ trees planted and monitored over time
- High school, undergraduate and graduate students trained



# Learning Exchanges

RESTORATION

EDUCATION



- USVI-BVI Learning Exchange (UVI, H. Lavity Stoutt Community College)



EDUCATION



# Mangroves in the Classroom Program

Created to support ocean literacy and stewardship in the USVI by engaging high school students in mangrove restoration and research.



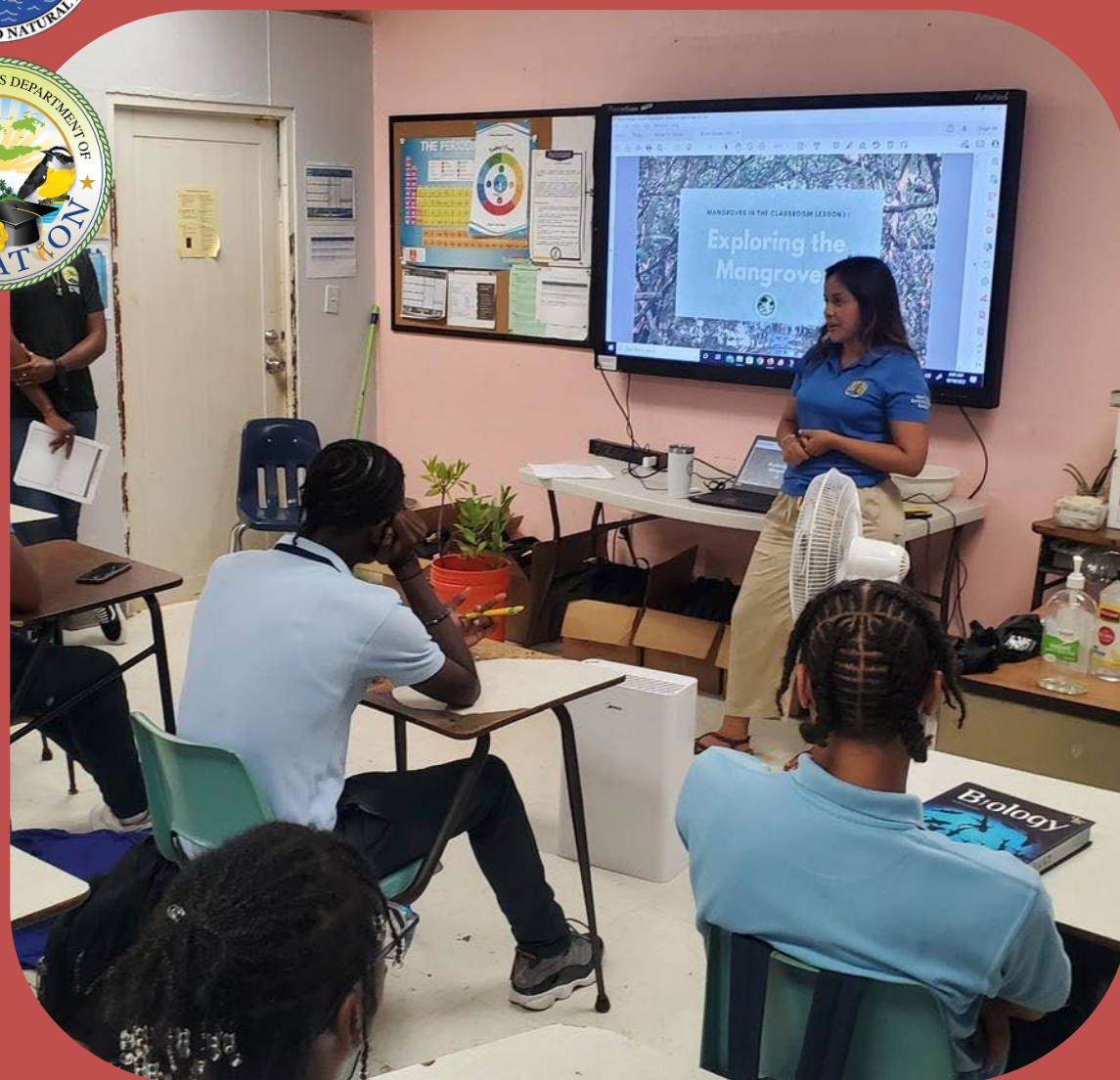
Watch our video



## Co-Created Curricula

## Classroom Experiment

## Experiential Learning



8 mangrove classroom lessons taught by UVI graduate and undergraduate students that align with Next Gen Science Standards.

Students and scientists co-design a classroom experiment to test sustainable methods to grow mangroves.

Students apply what they've learned in the field: kayak in mangrove environments, outplant mangroves, and visit UVI's nursery.



EDUCATION 

# STORM STRONG

U.S. VIRGIN ISLANDS





# IMPACT

**69**  
Students  
Engaged

**38**  
Classrooms  
Engaged

**11**  
Schools  
Engaged

**158**  
Classroom  
Visits

**24**  
UVI Students  
and Staff  
Trained

**14**  
Local  
Businesses &  
Partners  
Engaged

**26**  
Field trips  
conducted

**1,686**  
Mangroves  
Planted

# Great Mangrove Cleanups



OUTREACH



RESEARCH



## THE 2022 ST. THOMAS GREAT MANGROVE CLEANUP

Of the Vessup Bay Mangroves



• Since 2018, 842 volunteers aged 4-77 have removed more than 16 tons of marine debris from USVI mangrove shorelines!





Jordan Silva's  
Master's Thesis

# Mangrove Marine Debris Research





Grimes Lab, University of the Virgin Islands

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Mangroves



Contact  
Allie: [allie.durdall@uvi.edu](mailto:allie.durdall@uvi.edu)  
Kristin: [kristin.wilson@uvi.edu](mailto:kristin.wilson@uvi.edu)

Follow us on instagram at  
[grroe.usvi.mangroves](https://www.instagram.com/grroe.usvi.mangroves)

