The effects of salinity, temperature, and *Pomacea maculata* herbivory on Southwest Florida aquatic vegetation

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The Island Apple Snail

- **Scientific Name:** *Pomacea maculata*
- Native to South America \(^1\)
- Negative ecosystem impacts \(^3,^4\):
  - Competitive exclusion of native snail
  - Parasites
  - Inhibit wetland restoration
  - Agricultural pest
  - Alters macrophyte community structure
  - High consumption/growth rate
Tape Grass: What is it and Why is it Important?

- **Scientific name**: *Vallisneria americana*
- Deep-rooted, freshwater macrophyte
  - Tolerates about 10 psu salinity
- Ecological importance:
  - Food (manatees)
  - Shelter (nursery)
  - Water clarity
  - Reduces erosion
Tape Grass in the Caloosahatchee

(Doering et al., 1999)
Feeding Trials
One-way ANOVA

- Temperature increased grazing rate (P-value: 0.0049).
One-way ANOVA (log10 transform)

- Salinity has a significant effect on grazing rate (P: <0.0001)
Feeding Choice

Monoculture

- CONTROL
- OR

Polyculture

- Both
- FREE CHOICE
Two-way ANOVA

- Conclusive preference for *V. americana* when presented with free choice (P-value: 0.0185)

- Affinity for *H. verticillata* in monoculture, *V. americana* in polyculture

- **Compensatory feeding** - may have eaten more *Hydrilla* because it is a poorer food choice
Two-way ANOVA (square root transform)

- Conclusive preference for *V. americana* in monoculture and polyculture (P-value: <0.0001)
- More evidence that *Pomacea maculata* is not an effective way to manage invasive aquatic vegetation.
Mesocosm Experiment
Two-way ANOVA (square root transform)

- Significant difference between tanks containing snails and tanks with no snails (P-value: 0.0087)
Nominal Logistic - time (weeks) vs. treatment (salinity) on percent snail mortality

- No significant interactive effect between time and treatment.
- Statistically significant difference between treatment (P-value: <0.0001).
Questions?
References


