

Experimental long-term nutrient enrichment causes complex changes in seagrass and epiphyte community structure in Florida Bay

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Objectives

- Define spatial extent of N and P limitation in seagrass and epiphytic algal assemblages in Florida Bay
- Characterize timeline of ecosystem change during nutrient addition

Methods

To evaluate the effects of N and P enrichment across a nutrient gradient in Florida Bay, we used a blocked repeated measures ANOVA design. We established 24 study plots at each of three LTER sites: Duck Key, Bob Allen Keys, and Sprigger Bank. Each plot was enriched with nitrogen (N), phosphorus (P), both (NP), or neither (C) in bimonthly doses, beginning in September 2002.

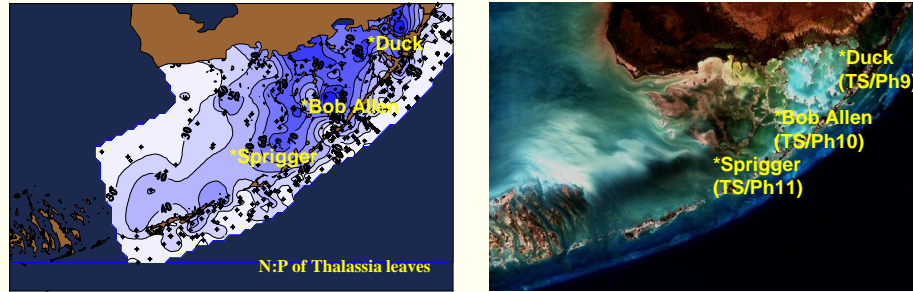
At quarterly intervals, we measured characteristics of the seagrass and epiphyte communities, including:

- Seagrass *Thalassia testudinum* abundance (Braun-Blanquet surveys)
- Epiphytic chlorophyll *a* (fluorometry)
- Epiphytic accessory pigments (HPLC)

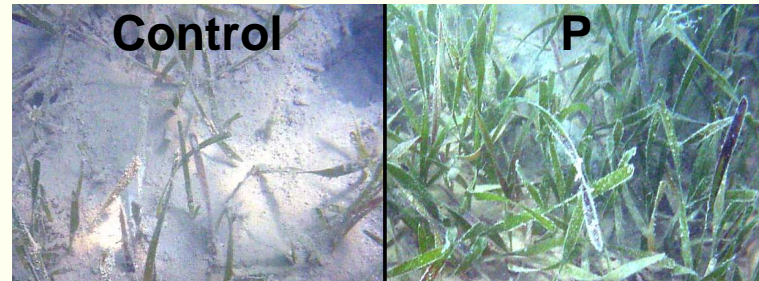
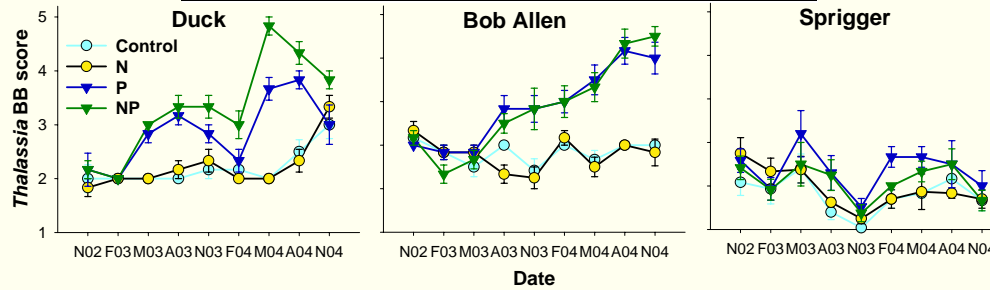


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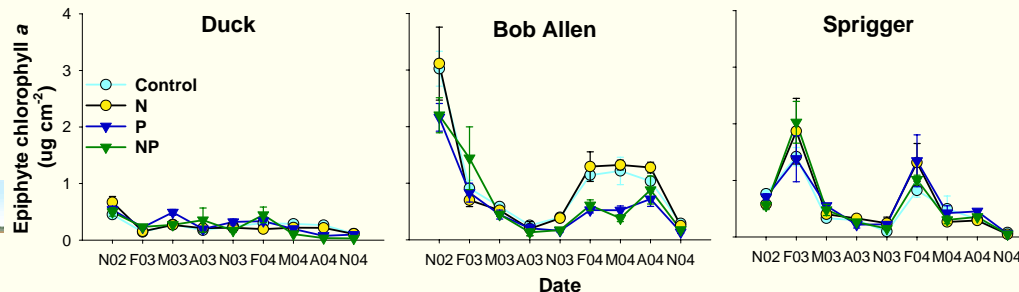
Sites along a phosphorus limitation gradient in Florida Bay



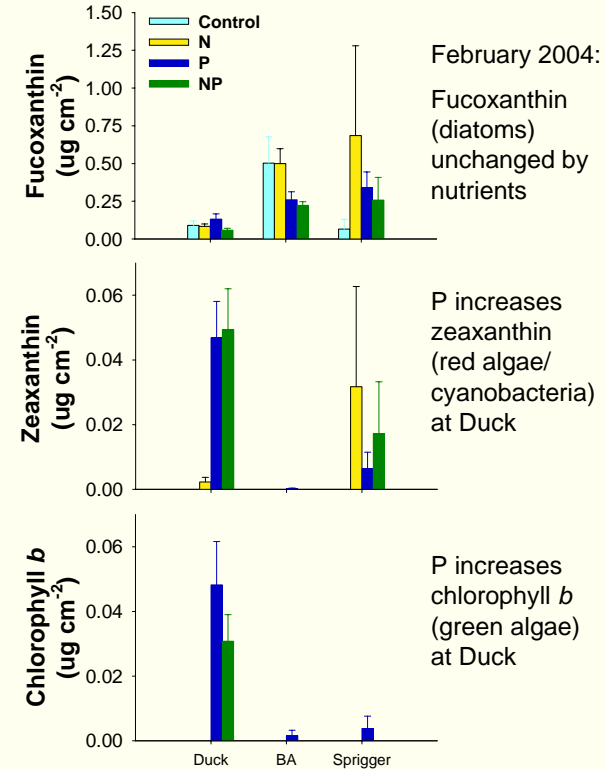
Thalassia is P-limited in the eastern bay



- Nutrients did not increase epiphyte biomass**
- Epiphytes did not overgrow *Thalassia* in enriched conditions**



Epiphyte composition shifts



Conclusions

- Strong regional variation: Phosphorus limits *Thalassia* in the eastern Bay; western Bay not nutrient limited**
- No epiphyte overgrowth of seagrass in enriched conditions. Are grazers controlling epiphytes?**
- Epiphyte community composition highly variable among sites**
- Epiphyte composition shifts in response to P at Duck—Are diatoms controlled by grazers? Green algae may be more palatable for grazers—How do grazers respond to epiphyte changes?**

