

Sapelo Island Salt Marsh
Central Georgia Coast, USA
Graduate Student John O'Donnell



Spatial and Temporal Perspectives on Multiple Stressor Impacts Spanning Inland to Coastal Ecosystems

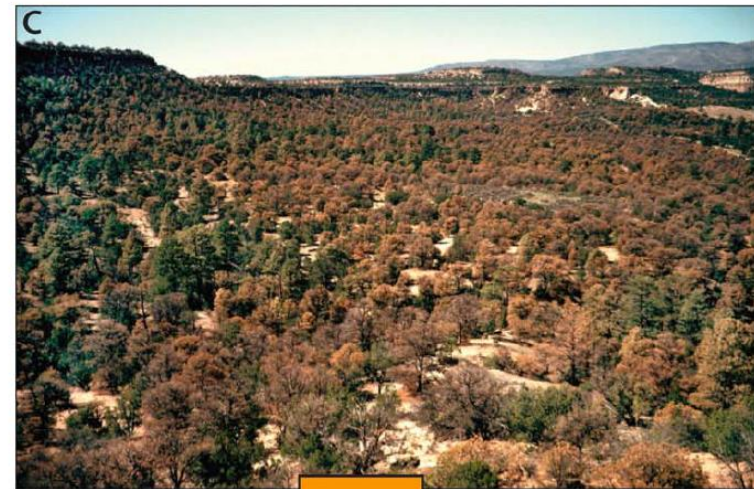
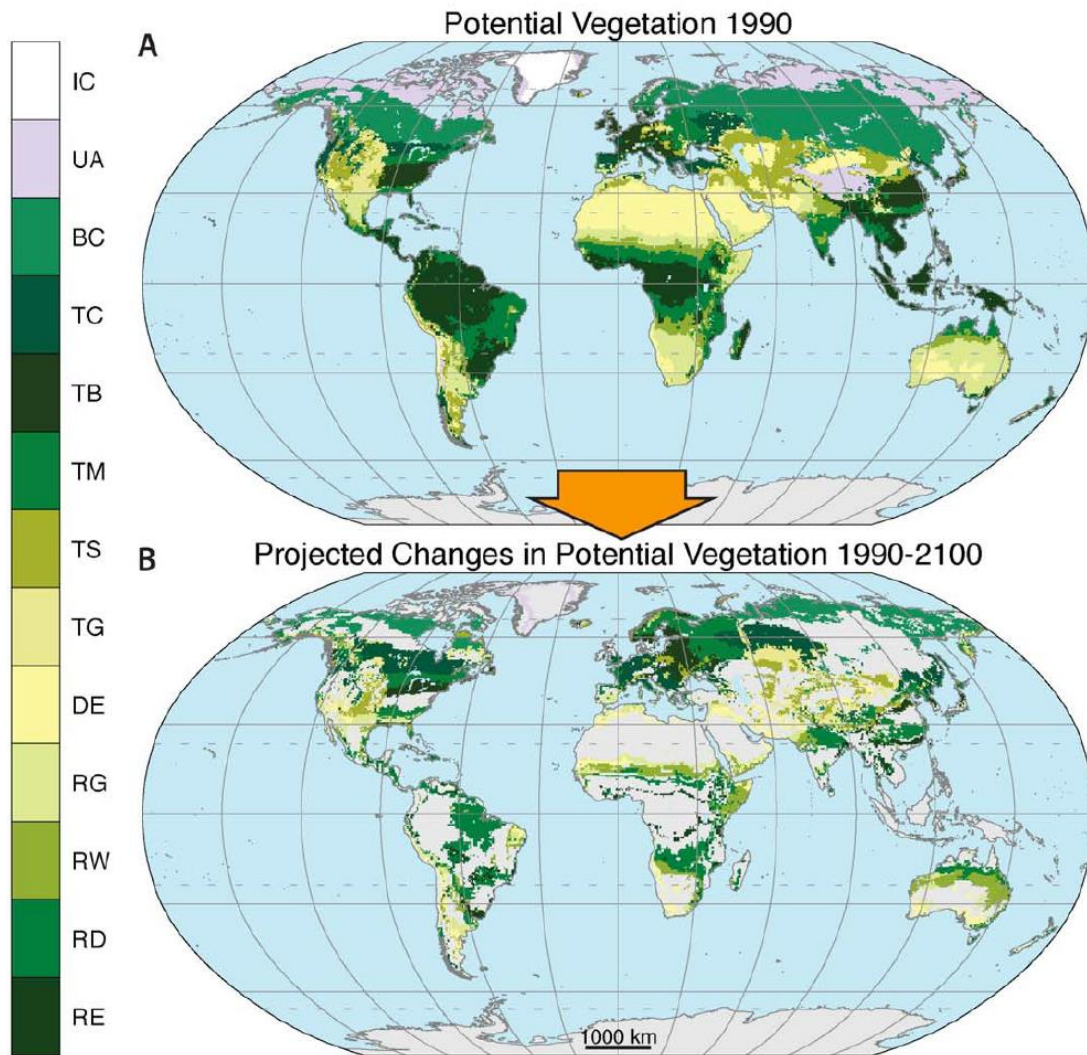
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NSF Georgia Coastal Ecosystems LTE

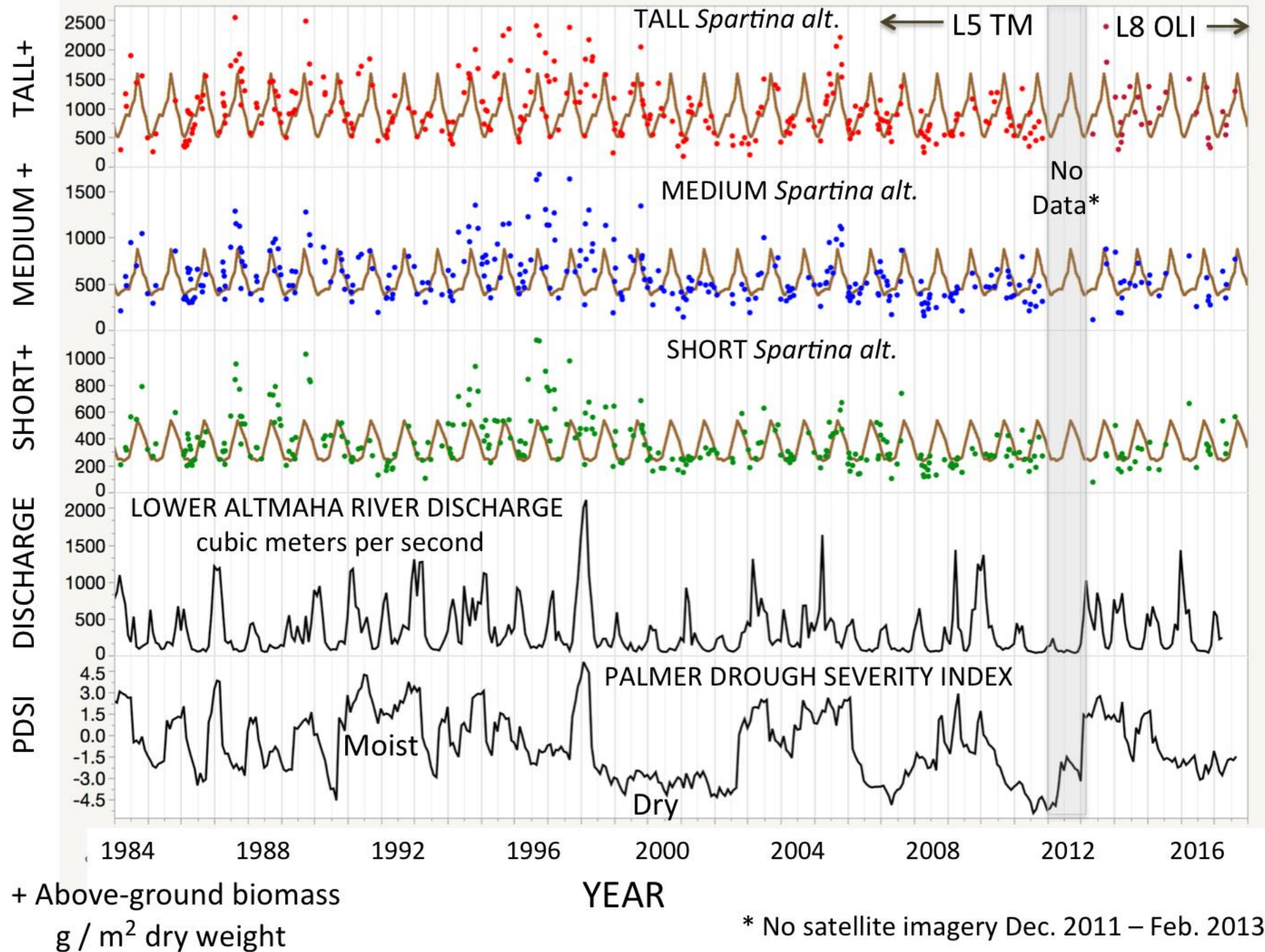


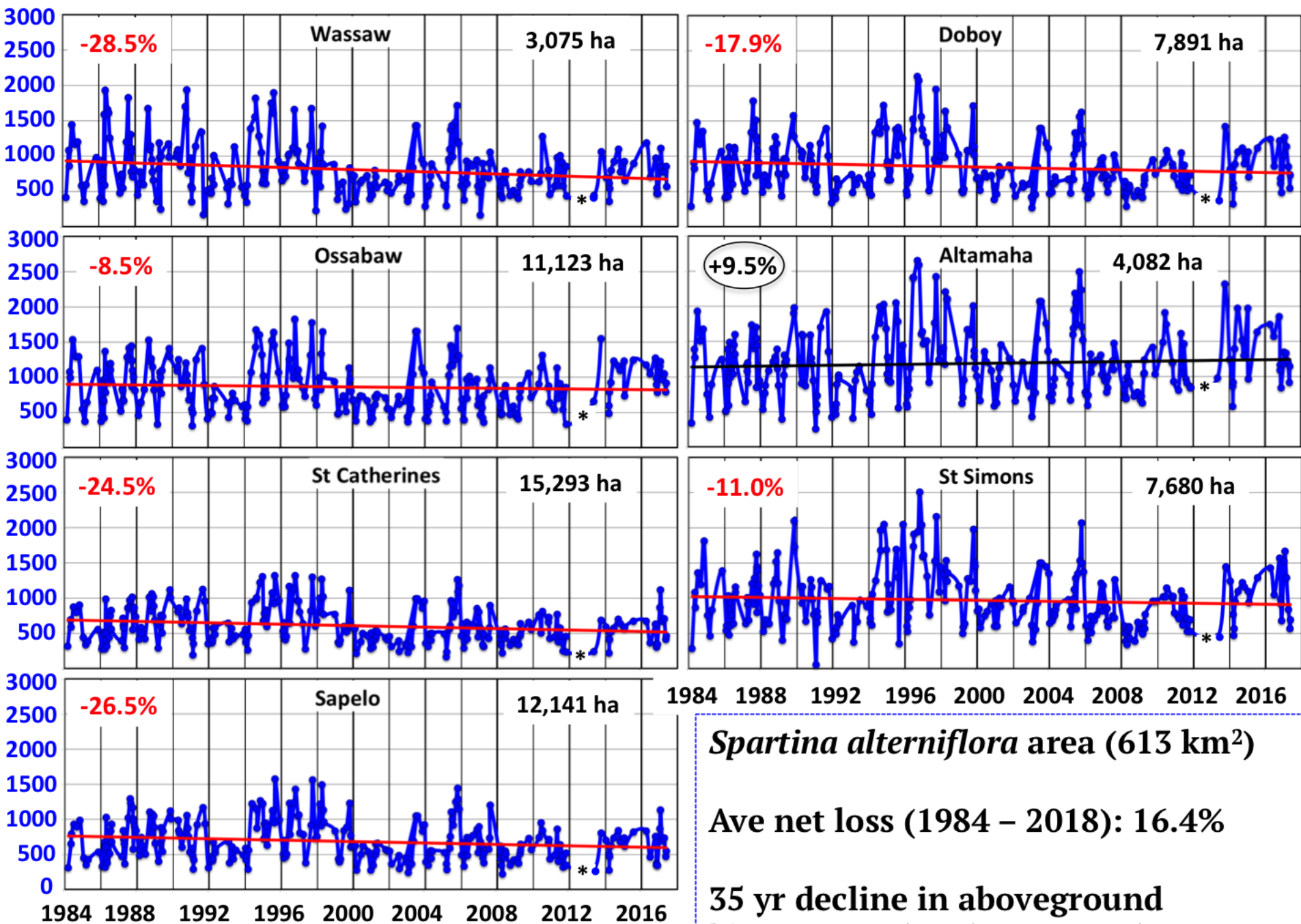
Shell Hammock Marsh – Phantom 4 Drone Partial Image (5 cm resolution, June 8, 2018)





On underestimation of global vulnerability to tree mortality and forest die-off from **hotter drought** in the Anthropocene. Allen et al. 2015. USGS Staff -- Published Research. Paper 886.





Spartina alterniflora area (613 km²)

Ave net loss (1984 – 2018): 16.4%

35 yr decline in aboveground
biomass: 85,705 MT (0.0857 TG)

Y Axis: g dry wt / m²

Plant
Biomass
(dry wt)

Micro-
Benthic
Algae
(Chlorophyll)

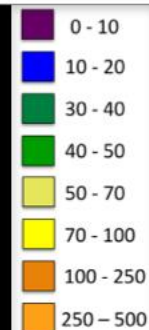
Phytoplankton
(Chlorophyll)

Duplin
River
Basin
AISA
Eagle
Survey
June,
2006

Biomass (g/m²)



CHL α $\mu\text{g}/\text{m}^2$
(provisional)



CHL α $\mu\text{g}/\text{L}$



Functional significance of the TSM patterns we observe with remote sensing ?

Sediments:

- Filling up our reservoirs and lakes
- Bind and transport heavy metals and many toxic organics
- Represent loss of valuable soil from agricultural lands
- Affect albedo and water temperatures
- Damage benthic plants and corals

Cayuga Lake, New York, U.S.



Charlie Golden – Georgia
Crabber



James Holland – Retired Crabber

- Listen to and learn from the people that live on and make their living from local waters.
- Often they care passionately about healthy waters and sustainable practices
- Stakeholders – they are real, and not just a box to check off on a grant proposal

Assorted Musings:

- Disruption of the global oceanic thermohaline circulation network complicates everything. The Gulf Stream is weakening
- How do we confirm apparent thresholds and state changes in the systems we study?
- Disease ecology outbreaks / syndromes in diverse aquatic systems (how much is due to external stressors?)
- Its often not enough to establish protected zones and ban actions with adverse consequences – we need to be more “adaptively clever”
- Rates of some geomorphic changes are accelerating: examples of melting glaciers, eroding deltas and barrier islands