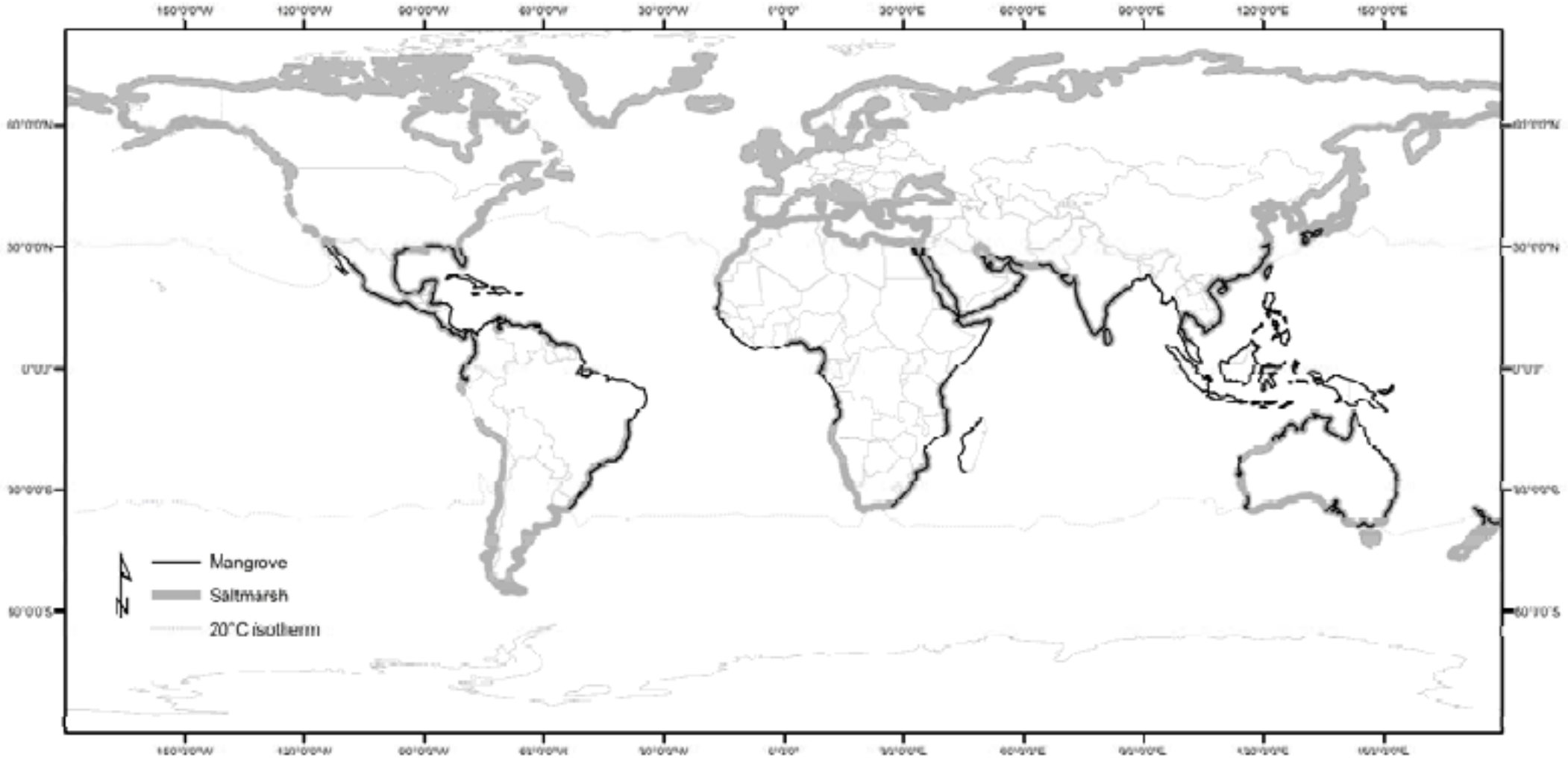
NOVEL INTERACTIONS MAY AFFECT RANGE EXPANSIONS: *IS HEAVY UNGULATE BROWSING RESTRAINING MANGROVE ADVANCE ON THE SOUTH TEXAS COAST?*

Tianna Picquet
Alejandro Fierro
Ilka Feller

Smithsonian

UTRGV

Mangrove Distribution

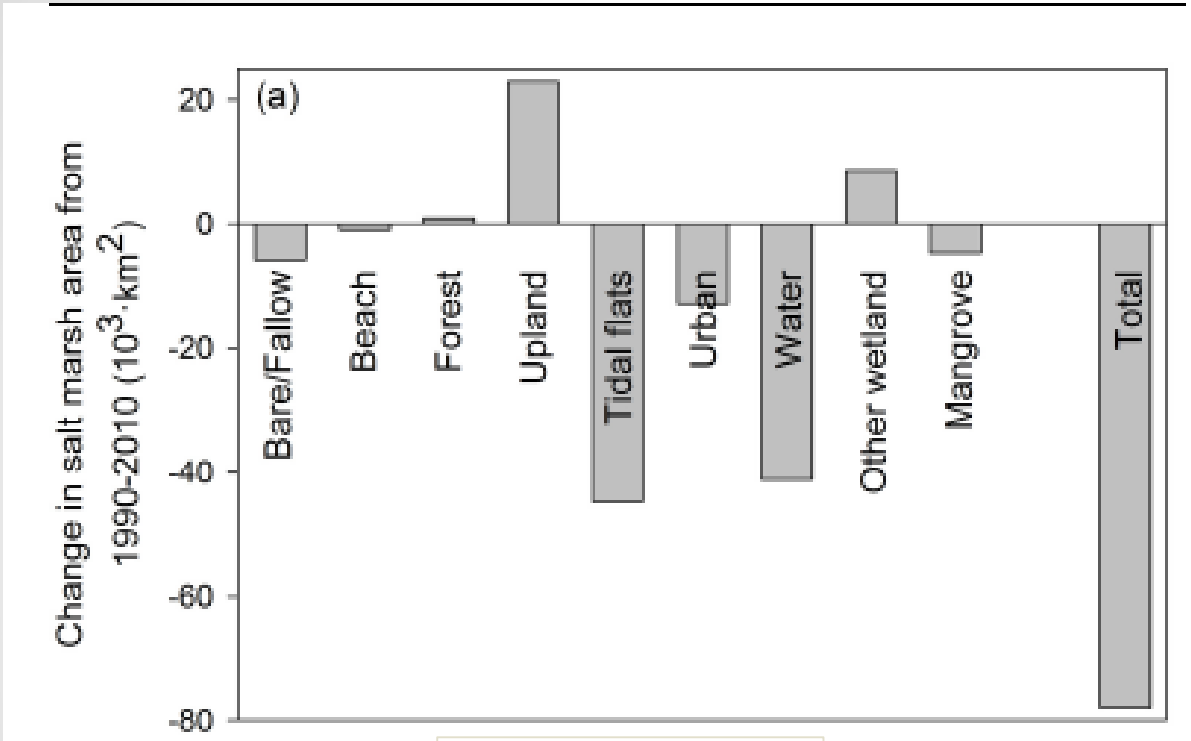


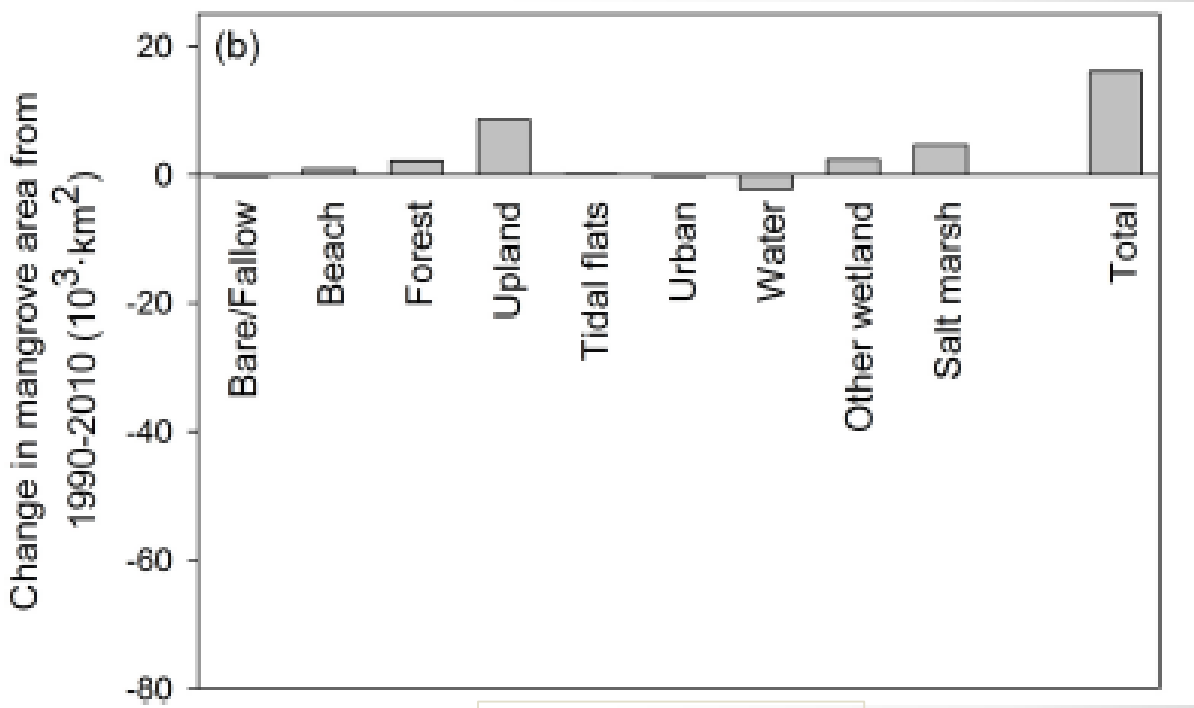
(Saintilan, et al., 2014)

Mangrove Expansion

- Increased surface temperatures
- Mangroves are indicator species for environmental change
- Movement to higher latitudes and replace salt marsh
- Fossil evidence of movements
- Frost contributes to population loss in the North
- Changes are in favor for mangroves

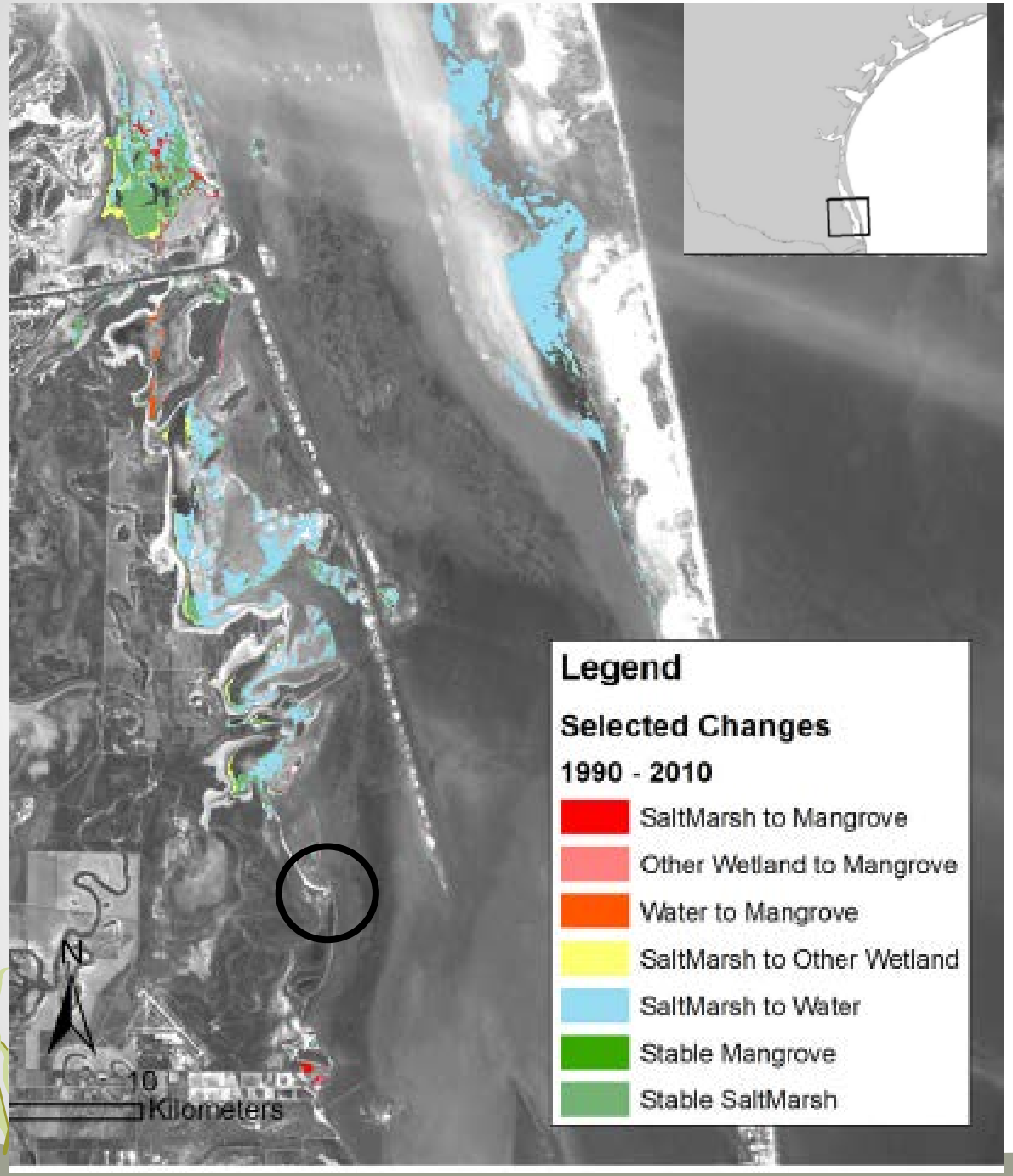
Mangrove Expansion





Changes in coverage along the TX coast
(Armitage, et al., 2015)

Mangrove Expansion- South Texas



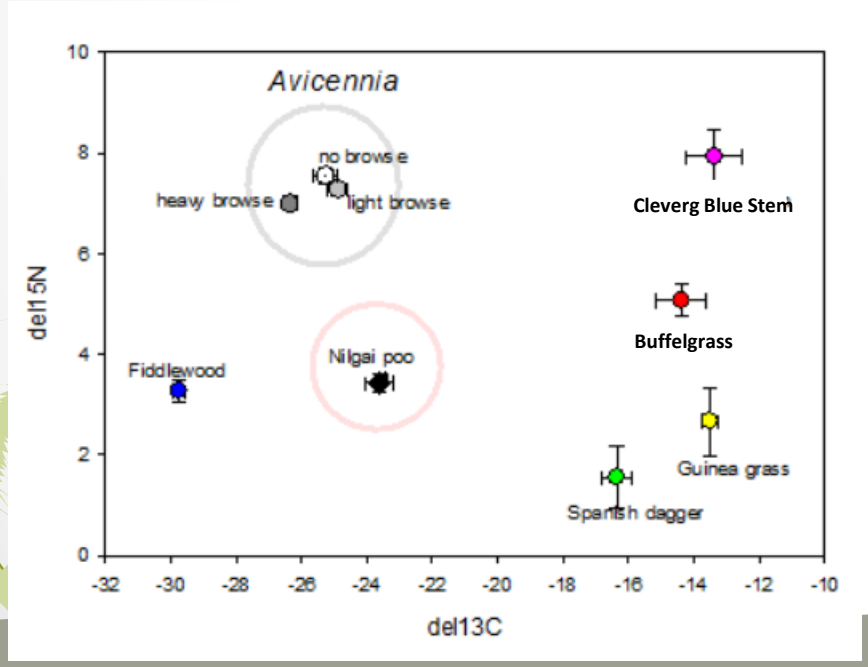
(Armitage, et al., 2015)

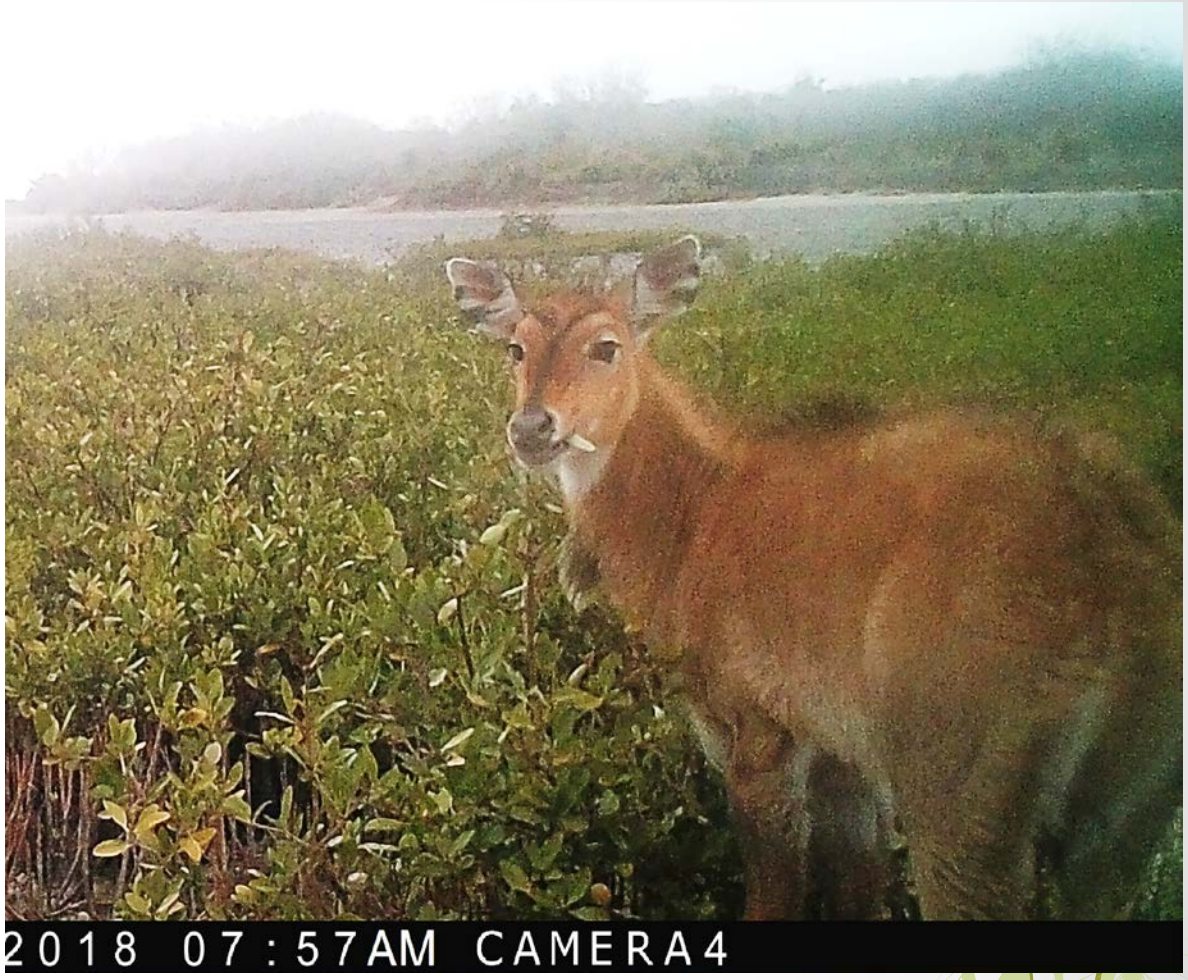
Avicennia germinans

- Cold tolerant (-6.7 to -8.9°C) (Lonard & Judd, 1991)
- Unaffected by drought
- Coverage has increased (5x in LA and 35% in FL) (Saintilan, et al., 2014)

Boselaphus tragocamelus

- Invasive to TX, introduced in the 1930's from India
- Recent evidence of heavy herbivory on mangrove stands
- Isotope data shows a diet preference
- Novel interaction





Parameters measured

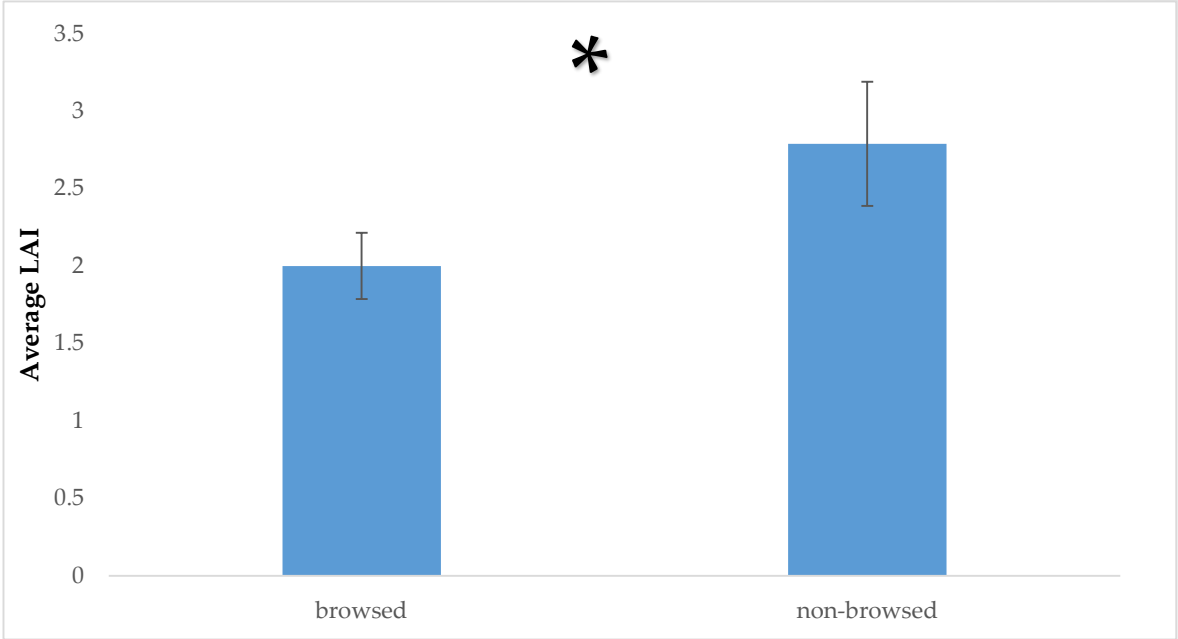
- Browsed vs. non-browsed mangroves
- Canopy Leaf Area Index (LAI)
- Resorption efficiencies of N and P
- Leaf chlorophyll content
- % Inflorescence
- Propagule size

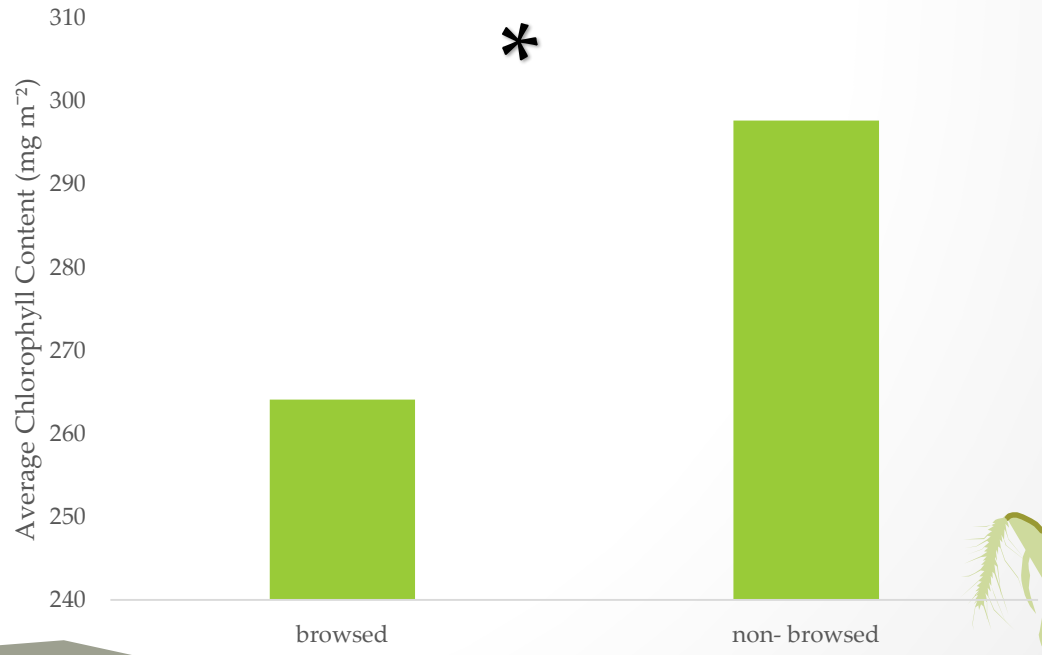
Methods

- Canopy LAI
  - LAI measured using a ceptometer
- N & P resorption
  - Elemental analyzer (for N) and ascorbic acid/ammonium molybdate method (for P)
- Chlorophyll content
  - Average chlorophyll content (mg/m^2) using a chlorophyll meter
- % Inflorescence
  - Counted Inflorescence per branch
- Propagule size
  - Collected randomly, dry mass was weighed out

Results

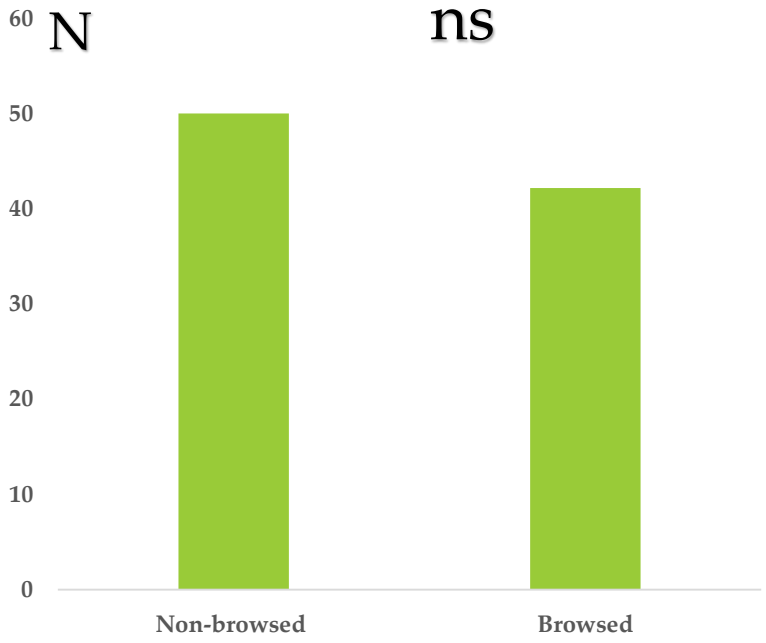
- Canopy LAI
  - Browsed mangrove stands had lower LAI values indicating less biomass
- Chlorophyll content
  - Browsed mangroves had lower chlorophyll content

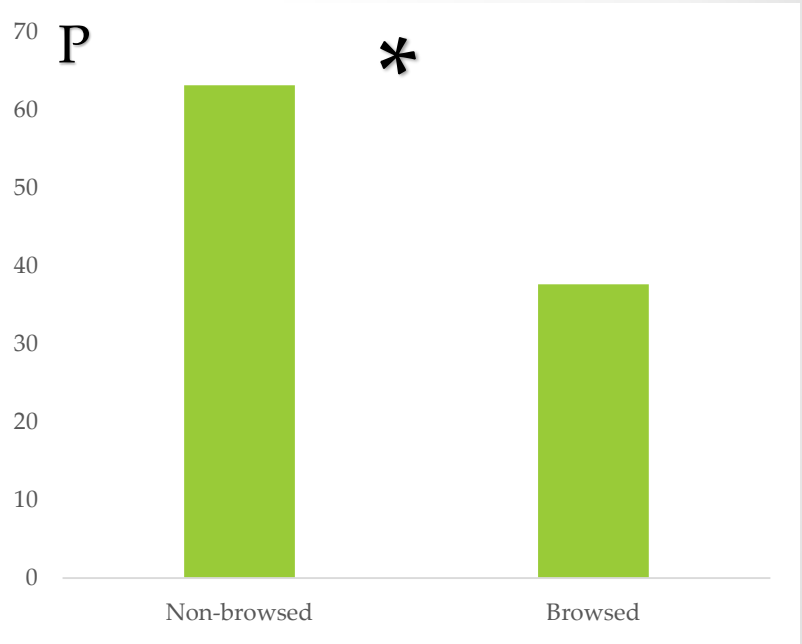




Results contd.

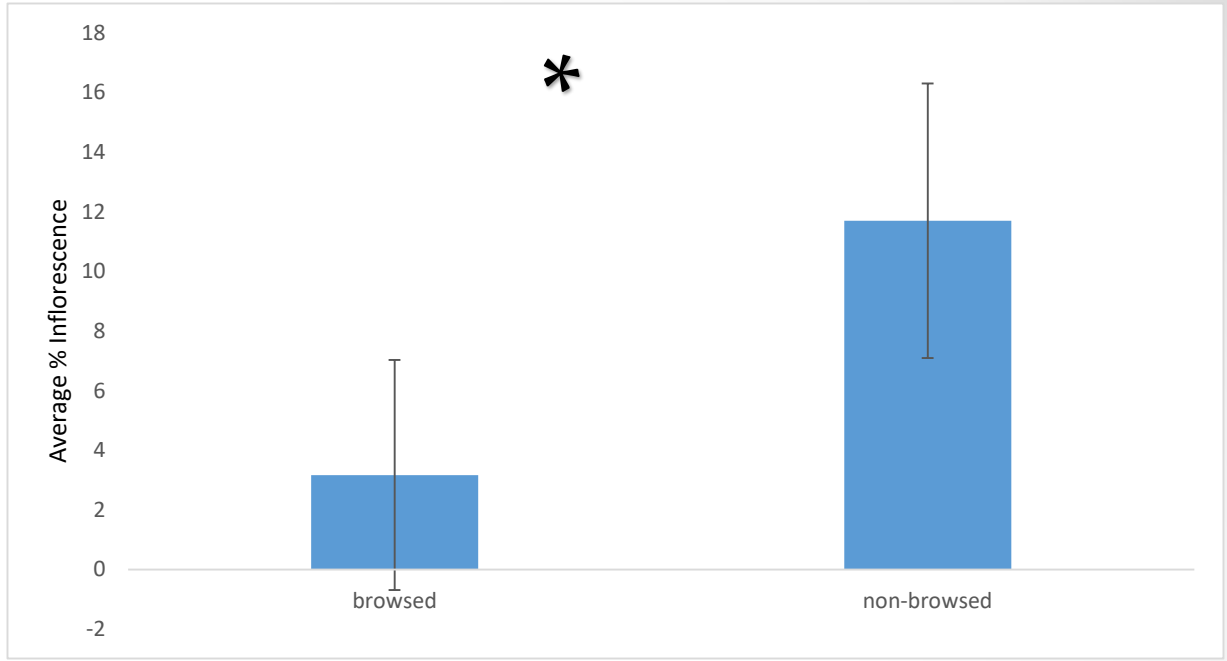
- N & P Resorption efficiency
  - Both areas had similar soil N and P content
  - Browsed mangroves had lower rates of resorption

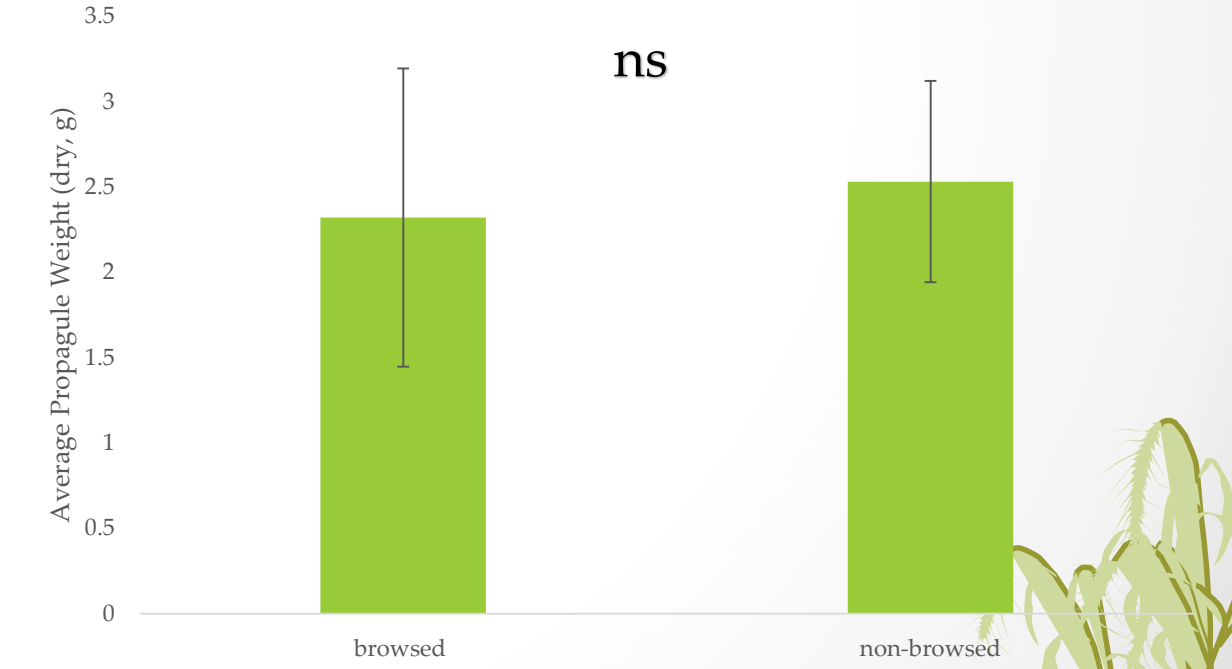




Results contd.

- % Inflorescence
  - Browsed mangroves had less flowers
- Propagule size
  - Browsed mangrove trees produced smaller propagules, not by much





What does this all mean?

- Lower photosynthetic capacity
- Reduced nutrient recycling and conservation (N & P)
- Reduced inflorescence production which may lead to a decrease propagule production
- Delay mangrove expansion

Thank you!