

Seagrasses and water quality in the FKNMS after Hurricane Irma

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FWC: Penny Hall and Brad Furman

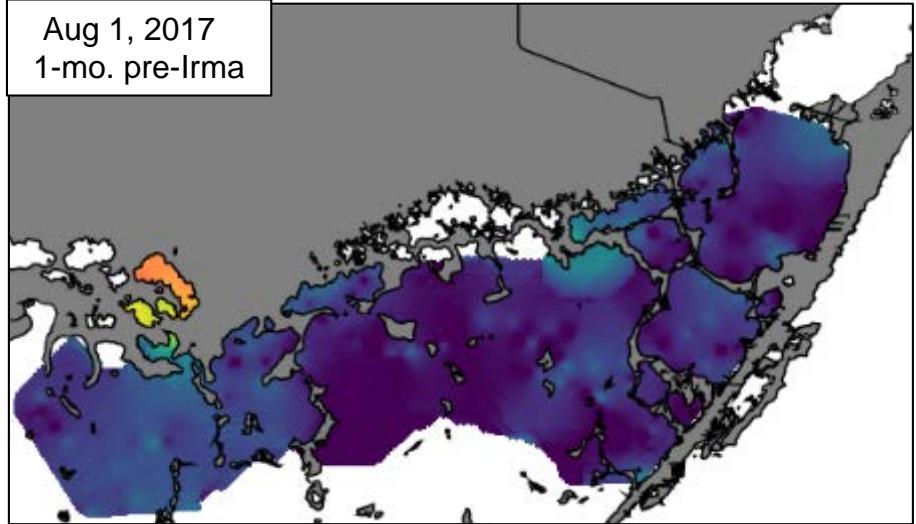
SFWMD: Chris Madden

FKNMS Sanctuary Advisory Committee Meeting
October 16, 2018 – Marathon, FL

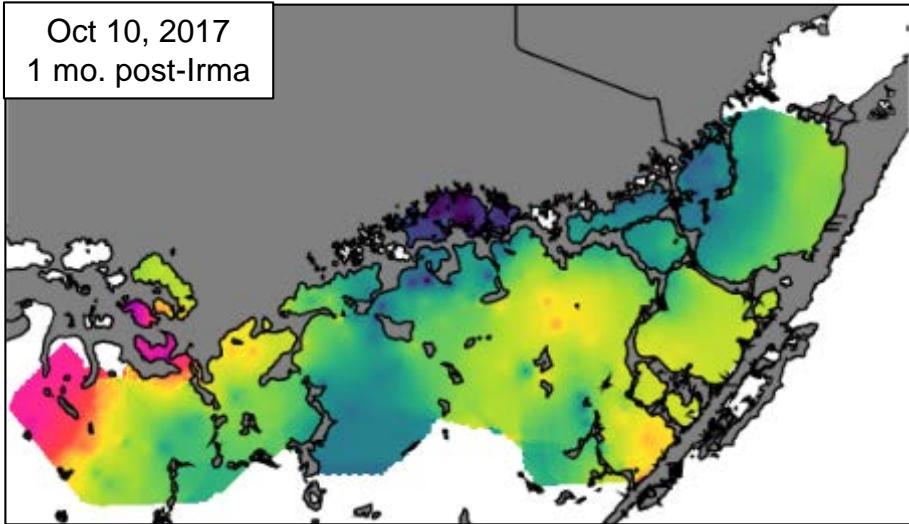


Chla in NE/Central Florida Bay Due to Hurricane Irma ($>5 \mu\text{g/l}$ = Algal Bloom)

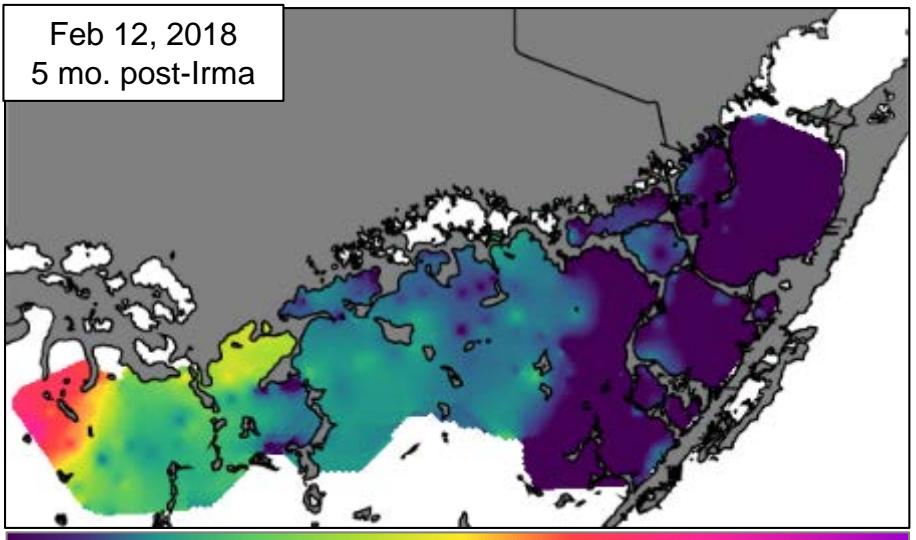
Aug 1, 2017
1-mo. pre-Irma



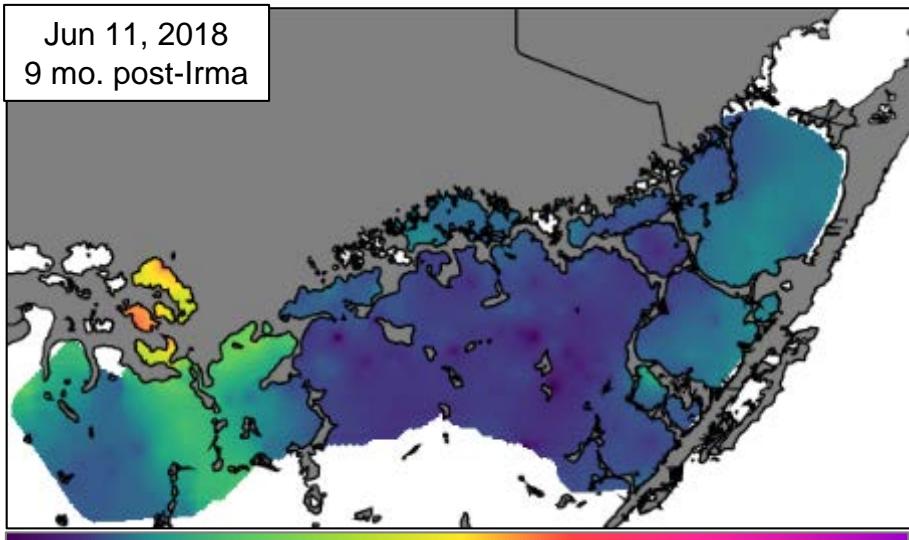
Oct 10, 2017
1 mo. post-Irma



Feb 12, 2018
5 mo. post-Irma



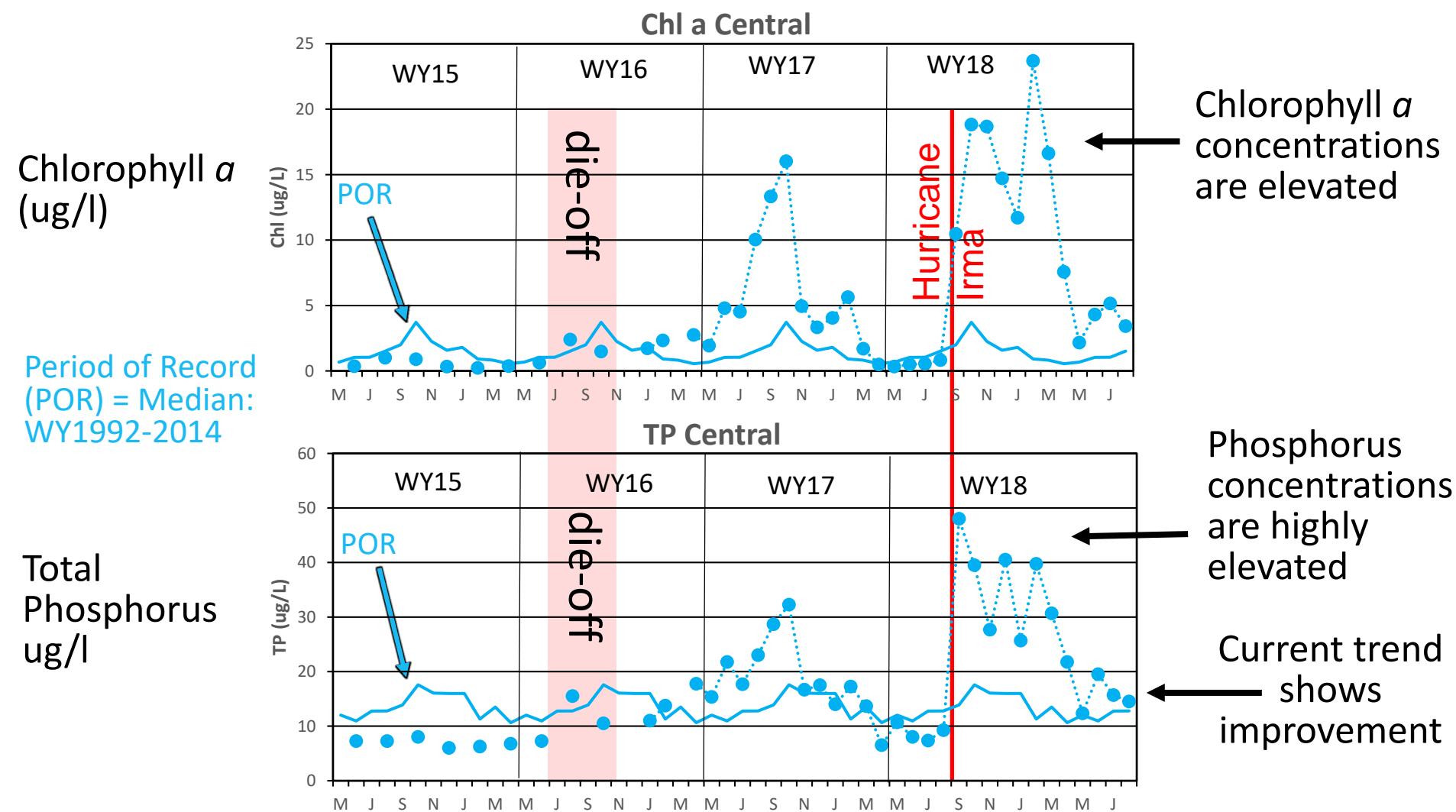
Jun 11, 2018
9 mo. post-Irma



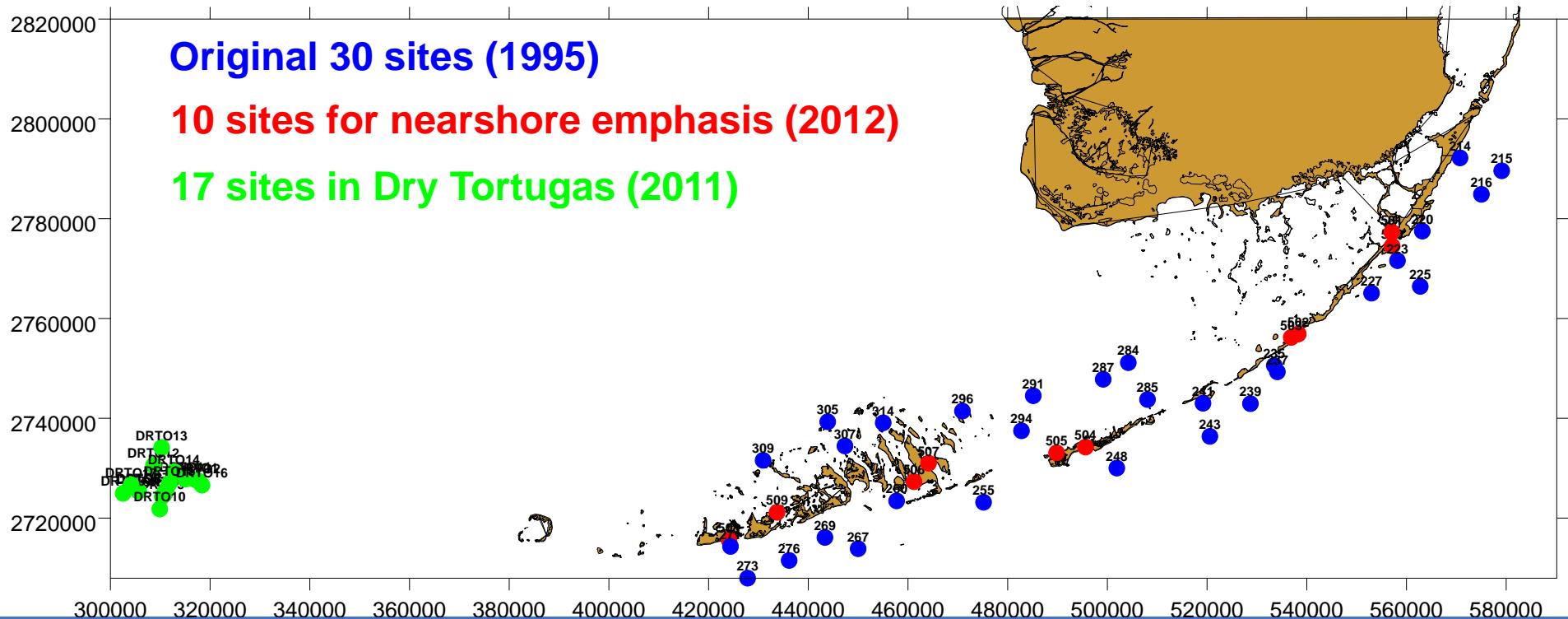
0 5 10 15 20 30 40 50 60
 $\mu\text{g/l}$

0 5 10 15 20 30 40 50 60
 $\mu\text{g/l}$

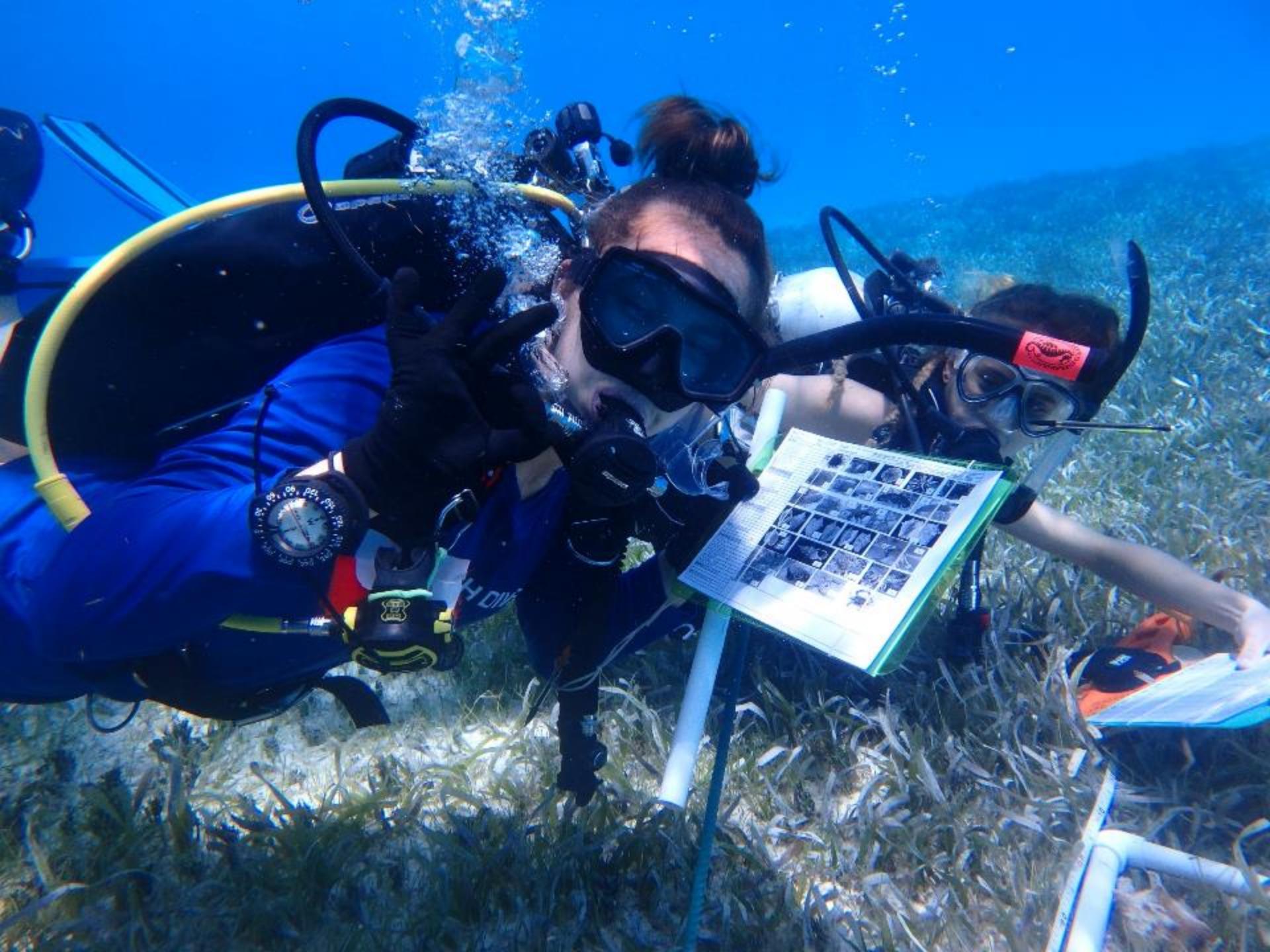
Water Quality Patterns in Central FI Bay: Die-off and hurricane impact



Benthic Habitat Permanent Monitoring Sites







Erosion or Burial at Site 243?

June 2017



Half of quadrats had lush Tt,
half were bare

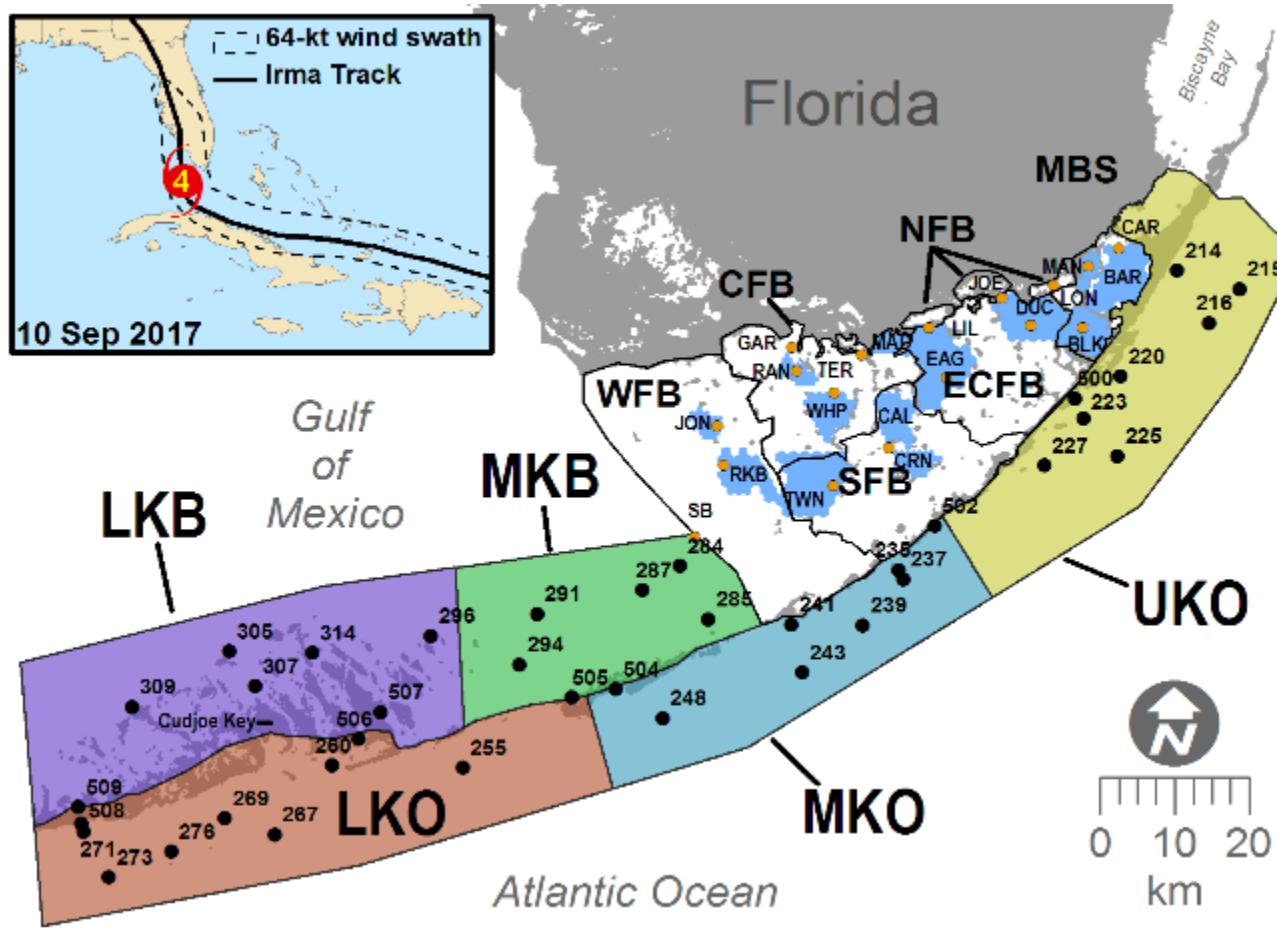
October 2017



Only quadrat left with
seagrass

Burial at Site 269





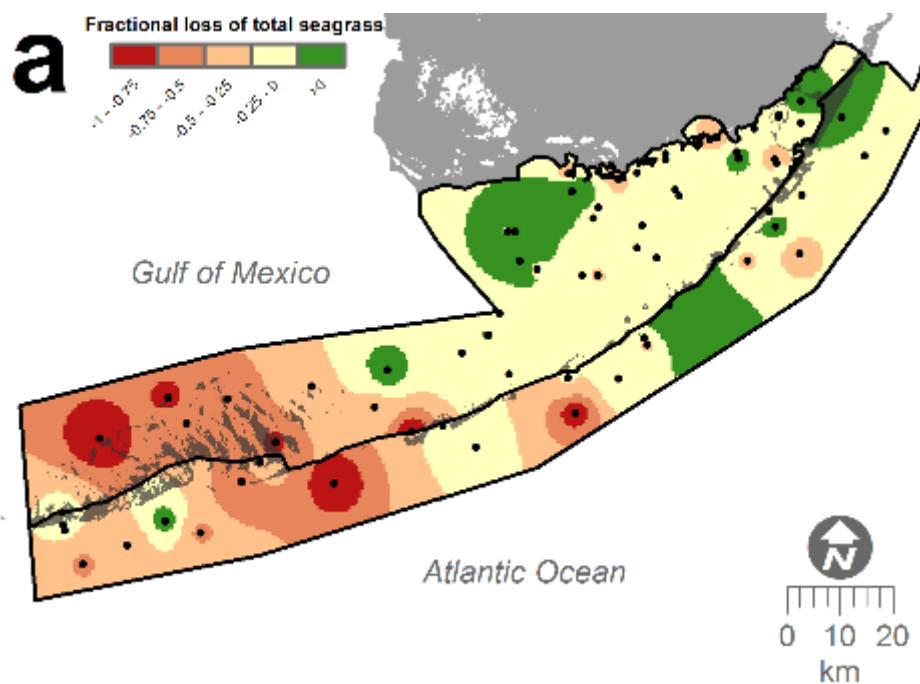
Florida Bay and FKNMS study sites (1995-present)

- WQPP transects (FKNMS)
- FHAP and FIU-LTER transects (Florida Bay)
- ◆ FHAP spatial basins (n=29 to 31 sites)
- Spatial zones used for statistical analysis

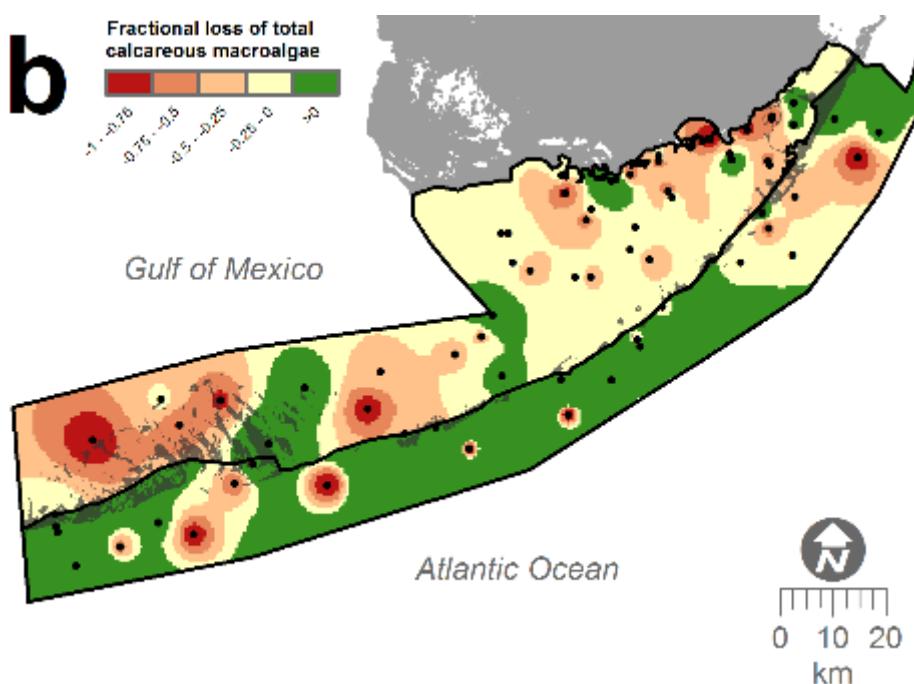
Spatial pattern in short-term response

(comparing post-Irma to pre-Irma seagrass and macroalgae abundance)

Seagrass



Macroalgae

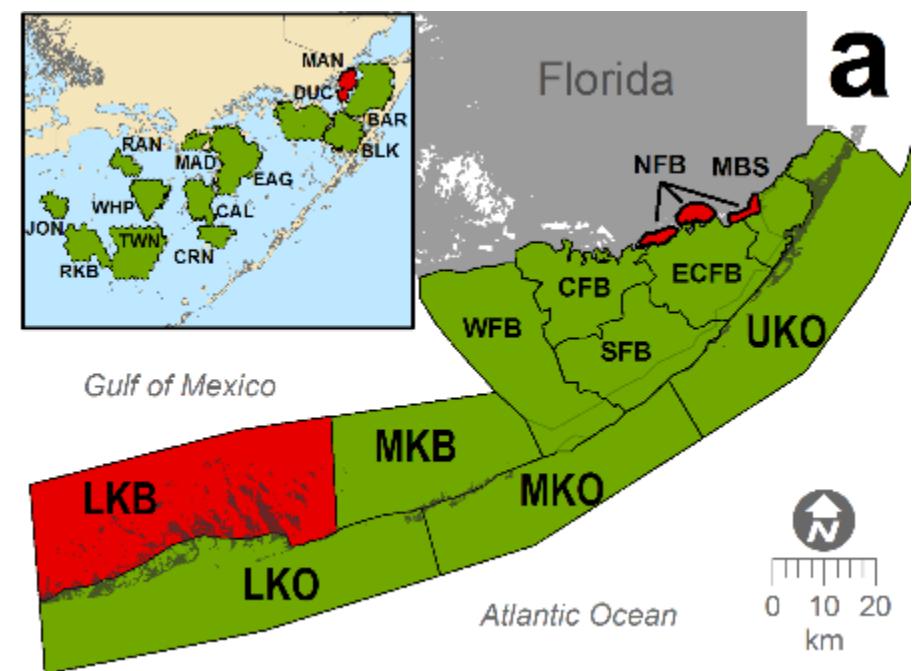


Nonparametric repeated measures analysis of variance

(Compares Fall/Spring 2017 changes to Fall/Summer 2012-2016 changes)

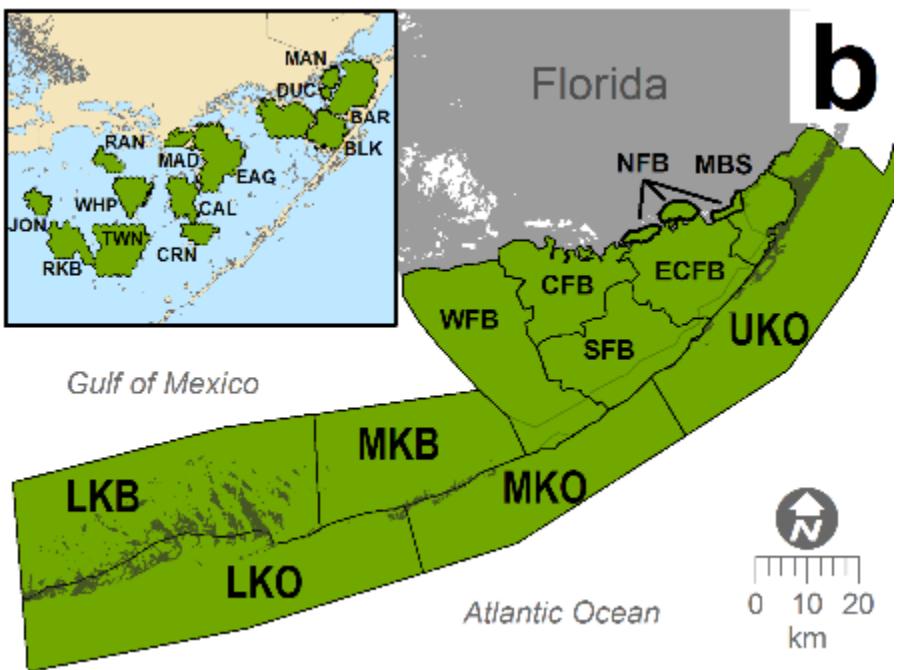
Seagrass

a



Macroalgae

b



Significant



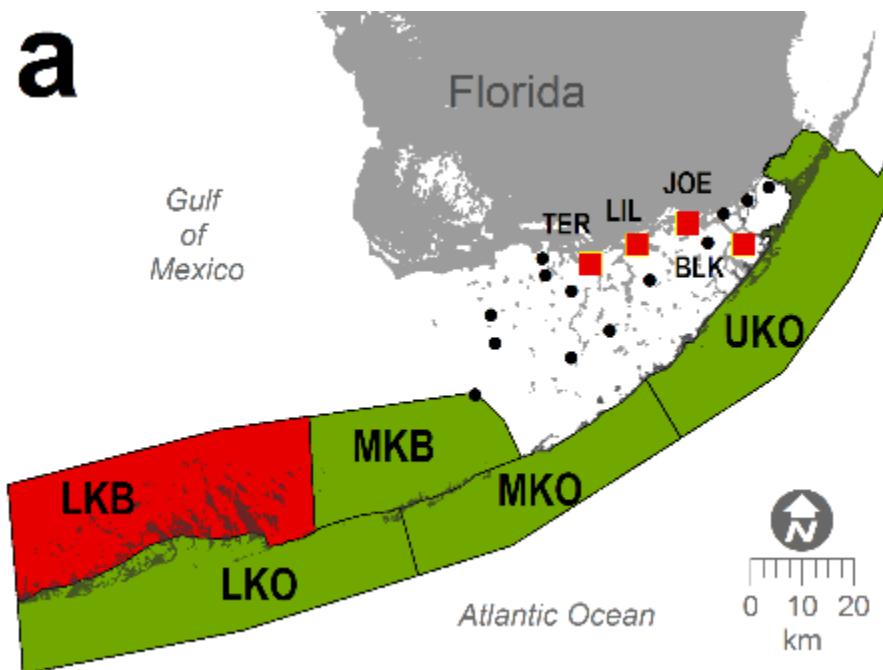
Non-Significant

Seasonal change analyses

(Compares Fall/Spring 2017 changes to Fall/Summer long-term changes using several statistical methods)

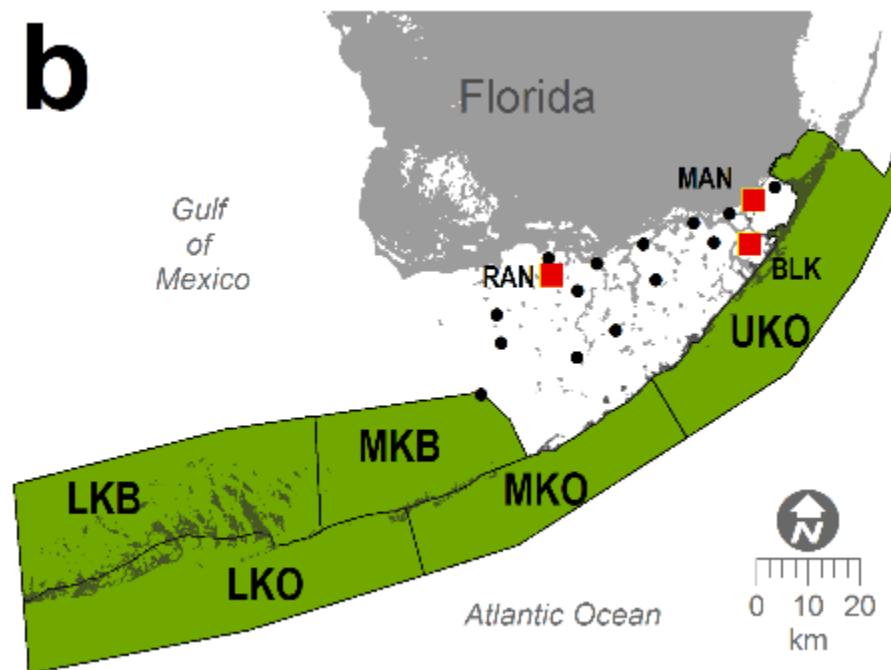
Seagrass

a



Macroalgae

b



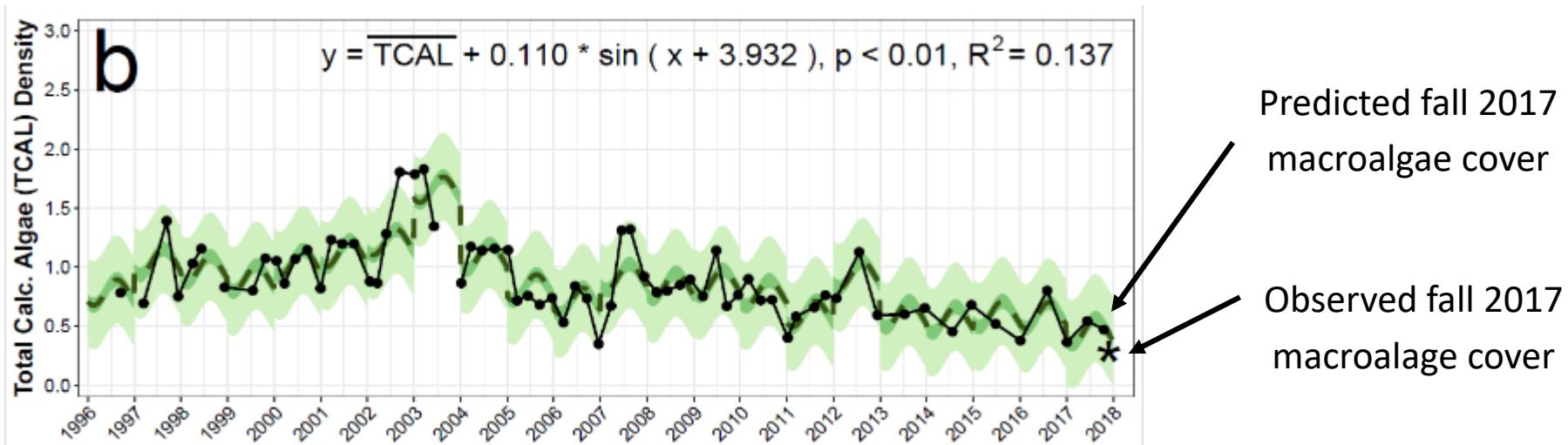
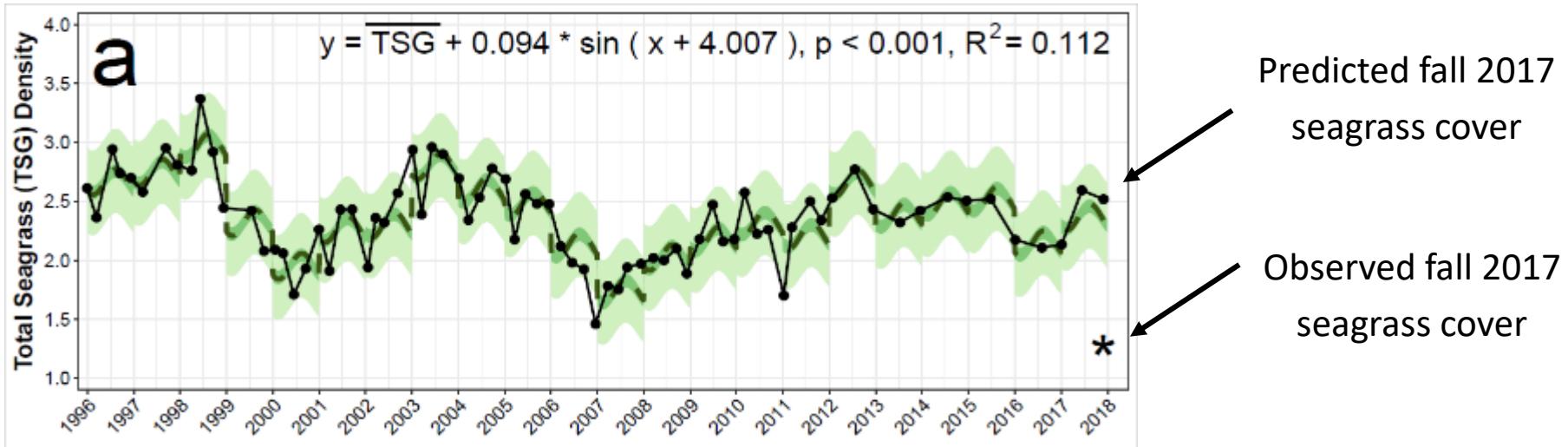
Significant

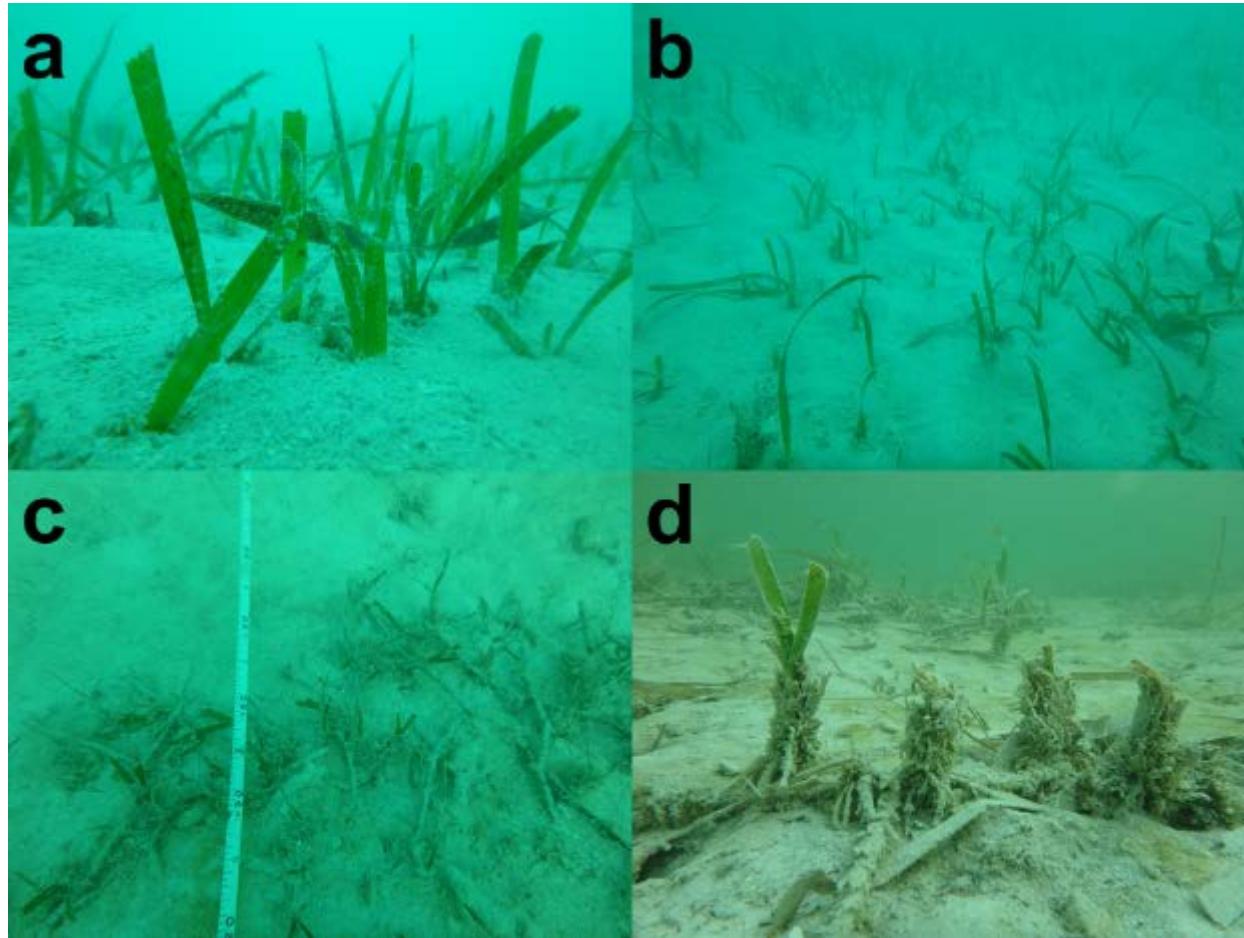


Non-Significant

FKNMS seasonal change analysis

(Uses data from 1995-2017 to predict fall 2017 seagrass/macroalgae cover)





- a. Moderate (5-10 cm) burial after Hurricane Irma at FKNMS site 255
- b. Moderate (5-10 cm) burial after Hurricane Irma at FKNMS site 239
- c. Strong seagrass erosion after Hurricane Irma at FKNMS site 276
- d. Erosion (background) and canopy thinning (foreground) at FKNMS site 294

Erosion and Thinning at Site 294



Recovery Trajectories after Hurricane Georges

