

Introduction and Southern Coastal Systems Rapid Update



David Rudnick
Everglades National Park

RECOVER Annual Science
Meeting
March 1, 2016



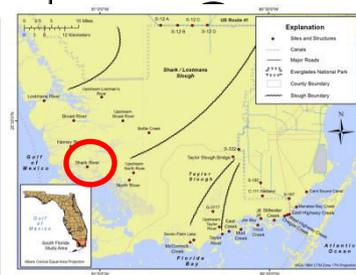
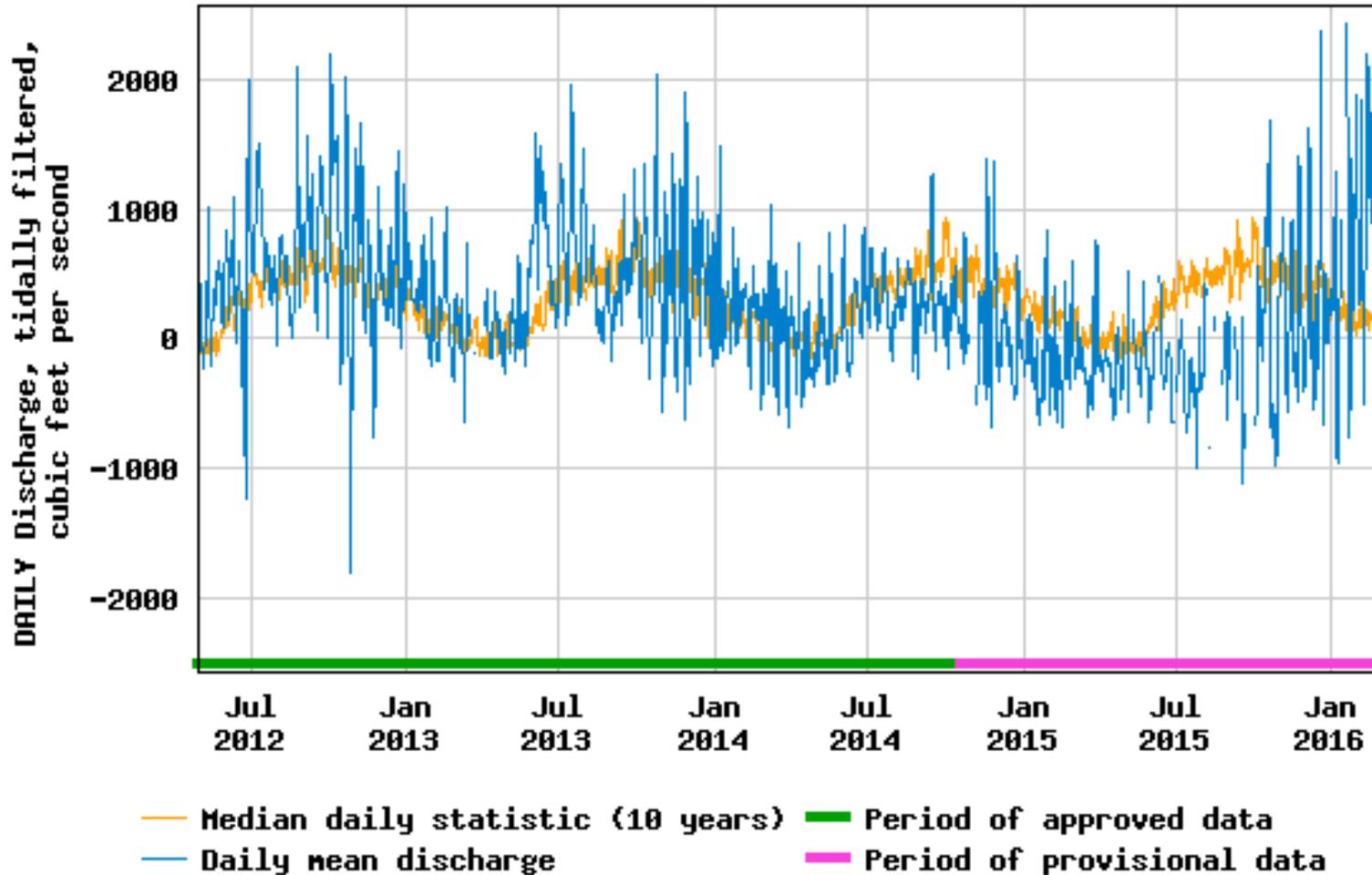
Southern Coastal Systems Monitoring and Assessment Plan Projects

1. Coastal Gradients (Zucker, USGS)
2. Hydrology, Aquatic Vegetation, and Fauna in the Southern Everglades (Lorenz and Frezza, Audubon)
3. Everglades Marsh and Mangrove Fish Dynamics (Rehage, FIU)
4. Fish Habitat Assessment Program (Hall, FWRI)
5. Juvenile Sportfish Monitoring (Kelble and Browder, NOAA)
6. Integrated Biscayne Bay Ecosystem Assessment Monitoring (Lirman, Bellmund, Browder, Serafy; UM, NPS, NOAA)

USGS Coastal Gradients (M. Zucker)

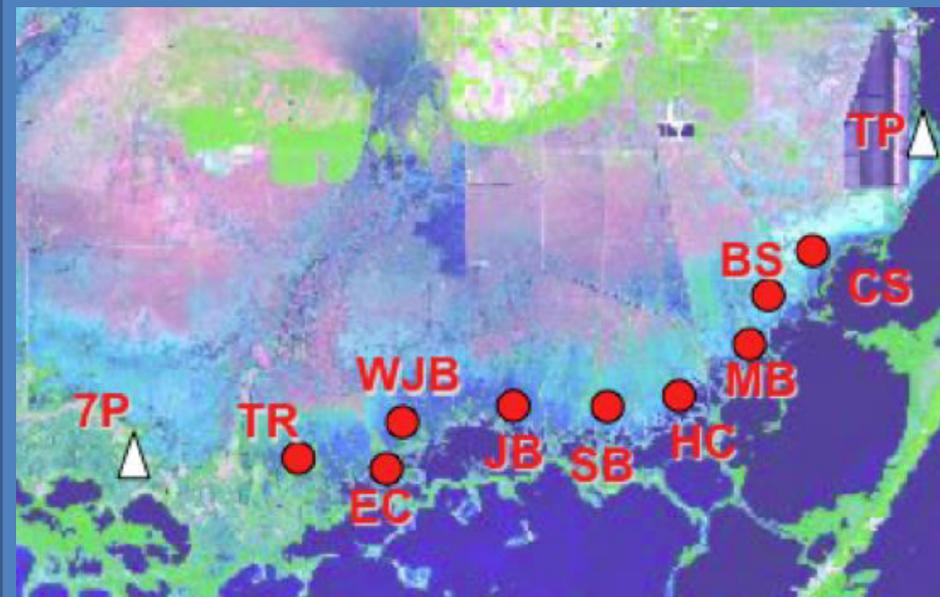


USGS 252230081021300 SHARK RIVER BELOW GUNBOAT ISLAND NR FLAMINGO, FL

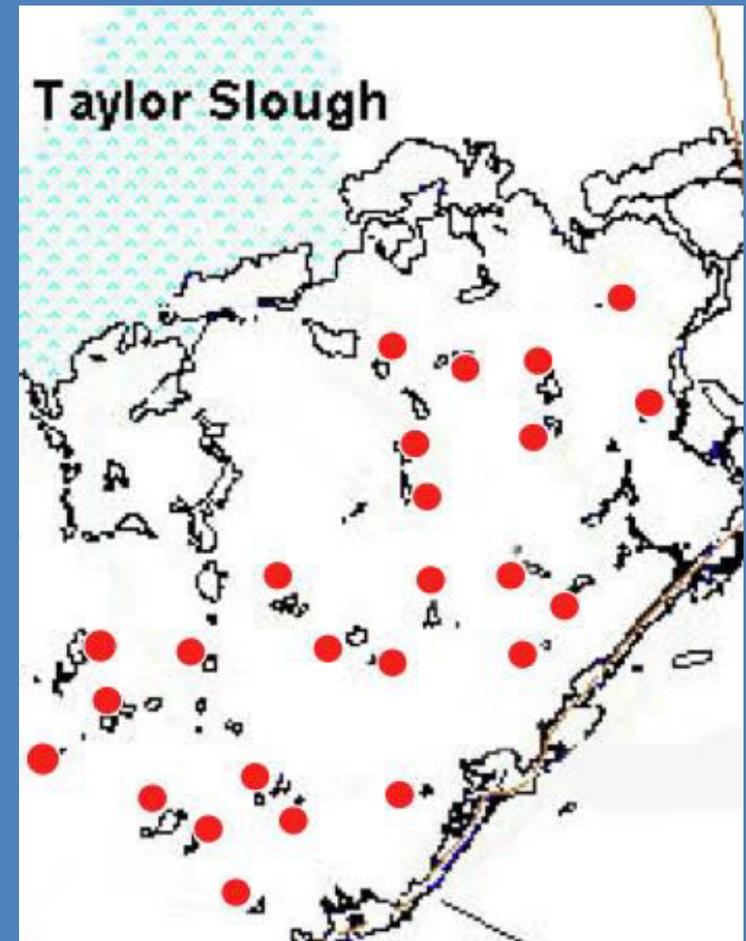


USGS data provisional and subject to change

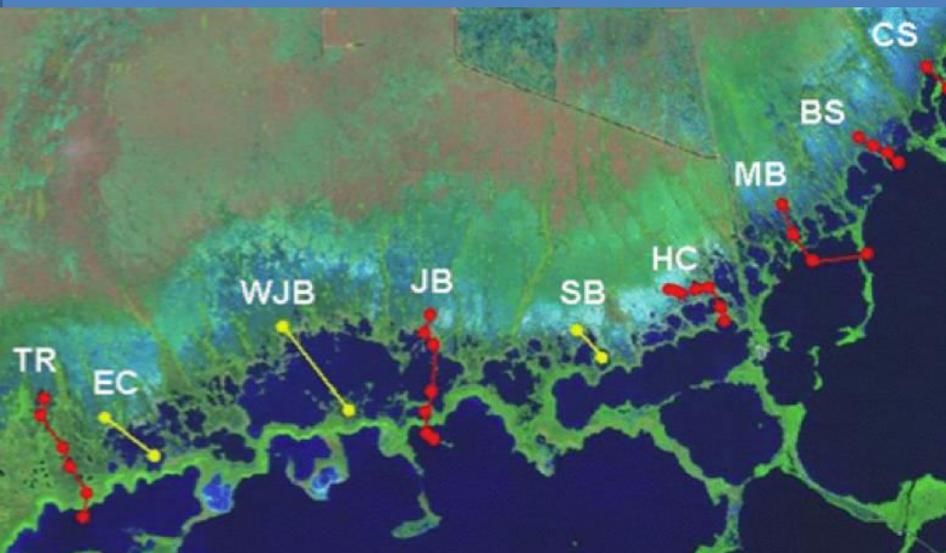
Audubon Florida Everglades Science Center Monitoring Program



Hydrostations and Fish Sampling



Wading Bird Colonies Surveys

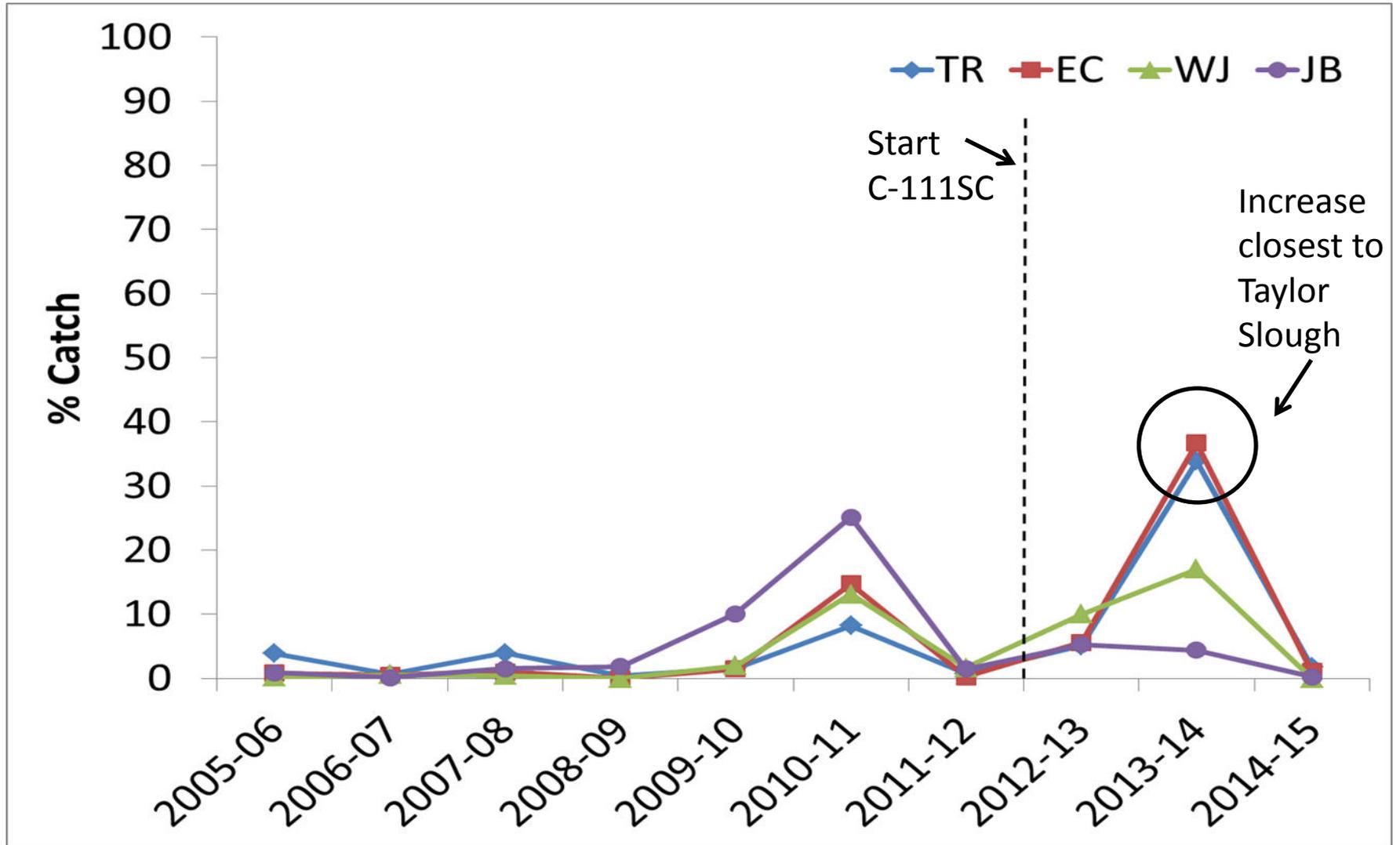


SAV Transects

Example: Evaluation of C-111 SCW Project

- Normal Rainfall Years 2012-13 and 2013-14 suggested positive responses to Project compared to control years
 - Increased TS flow, lower salinity, longer hydroperiod
 - Increased SAV and prey fish
- Drought Year 2014-15 Project had no or negative response compared to control year
 - Decreased flow, similar salinity,
 - Decreased SAV and prey fish

Freshwater Species as Percent of Coastal Wetland Fish Assemblage



Fish dynamics at the marsh-mangrove: dry downs, subsidies, cold snaps & the link to recreational fisheries



Jennifer S. Rehage

Earth & Environment

Southeast Environmental Research Center

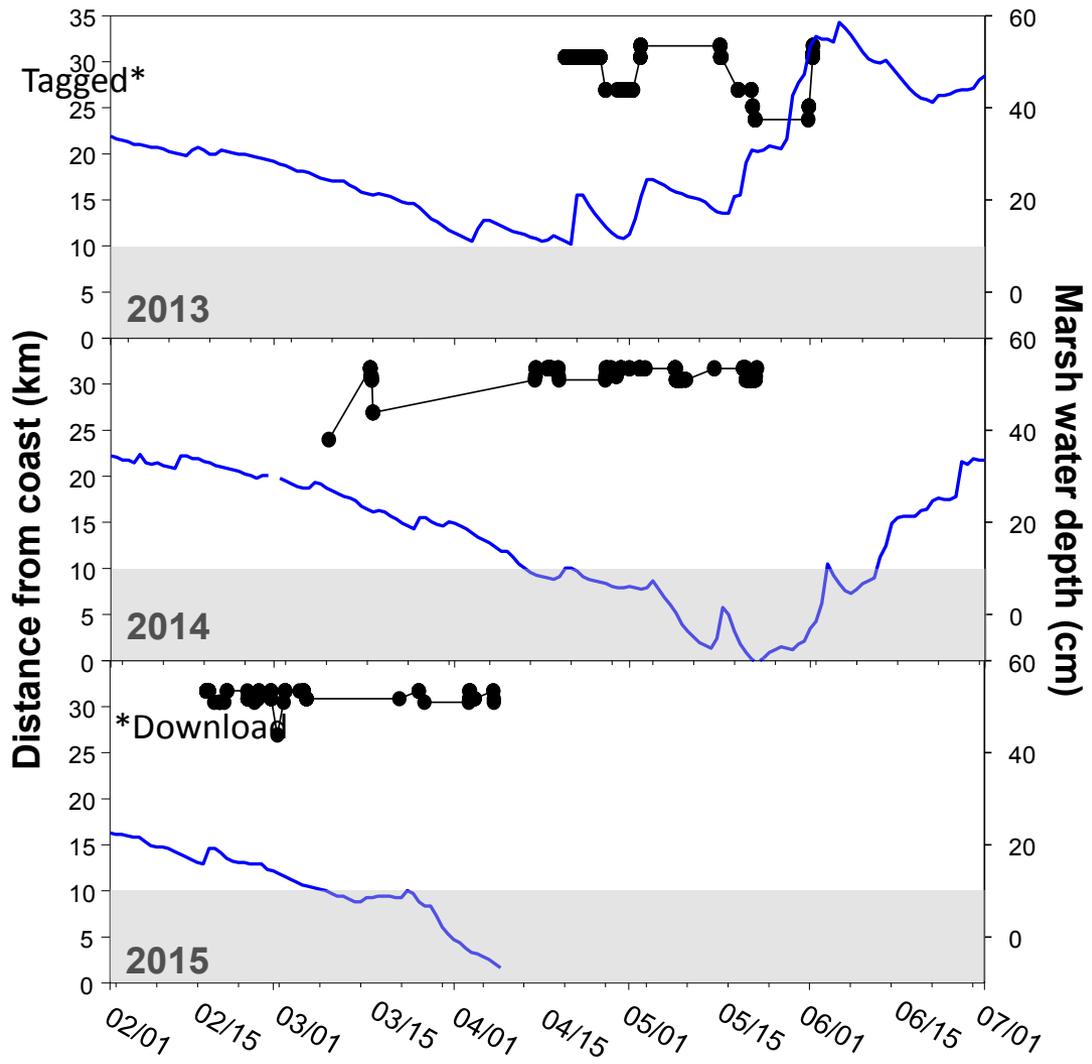
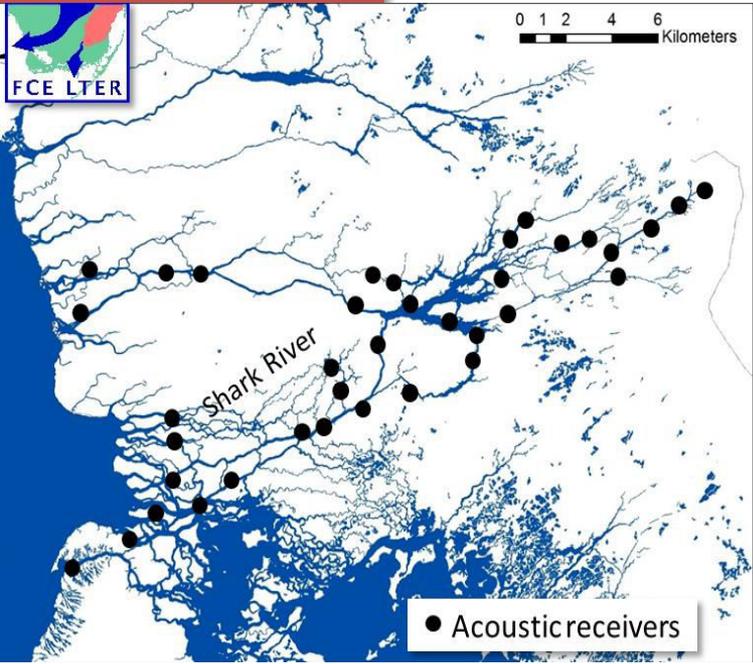
Florida International University

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Enter estuary in dry season



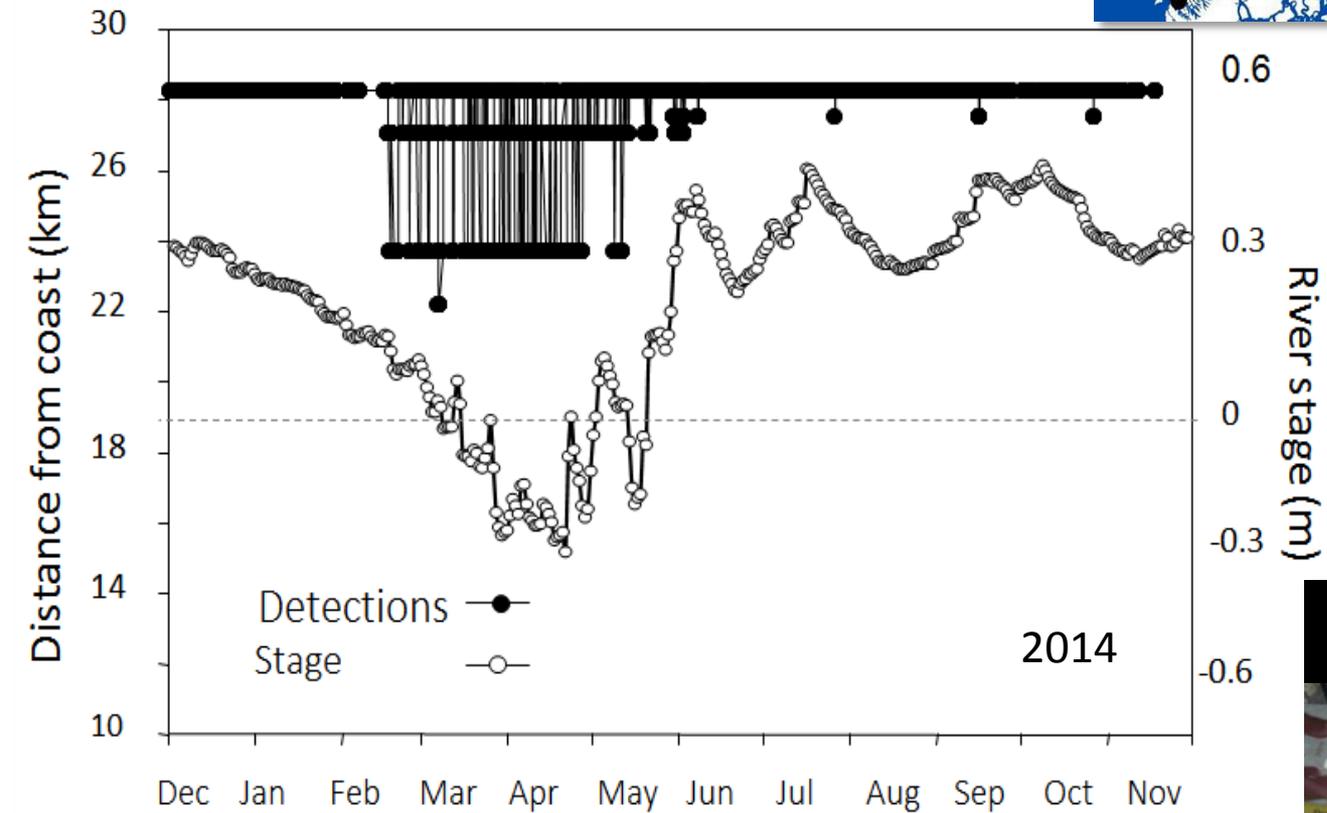
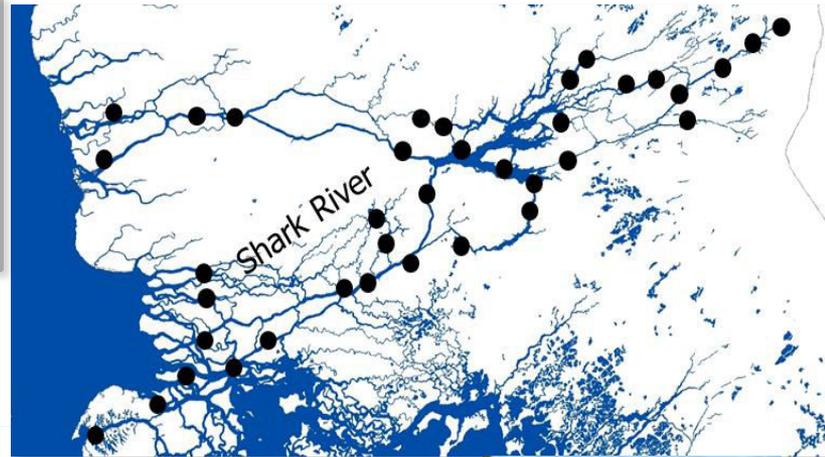
Acoustic Telemetry



Tag# 32925, 1 kg, 35cm



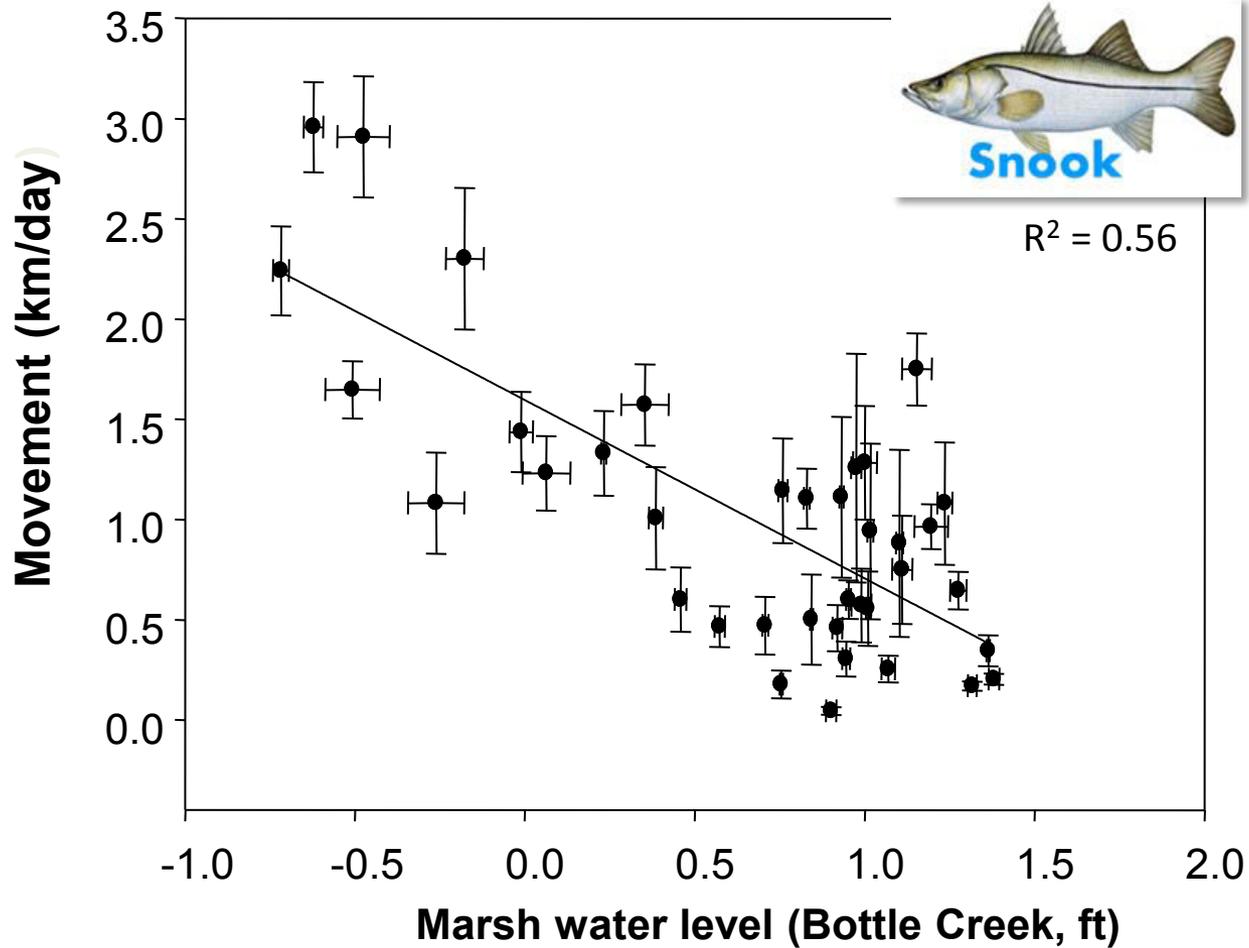
Movement
increases at low
water



Boucek et al. in prep

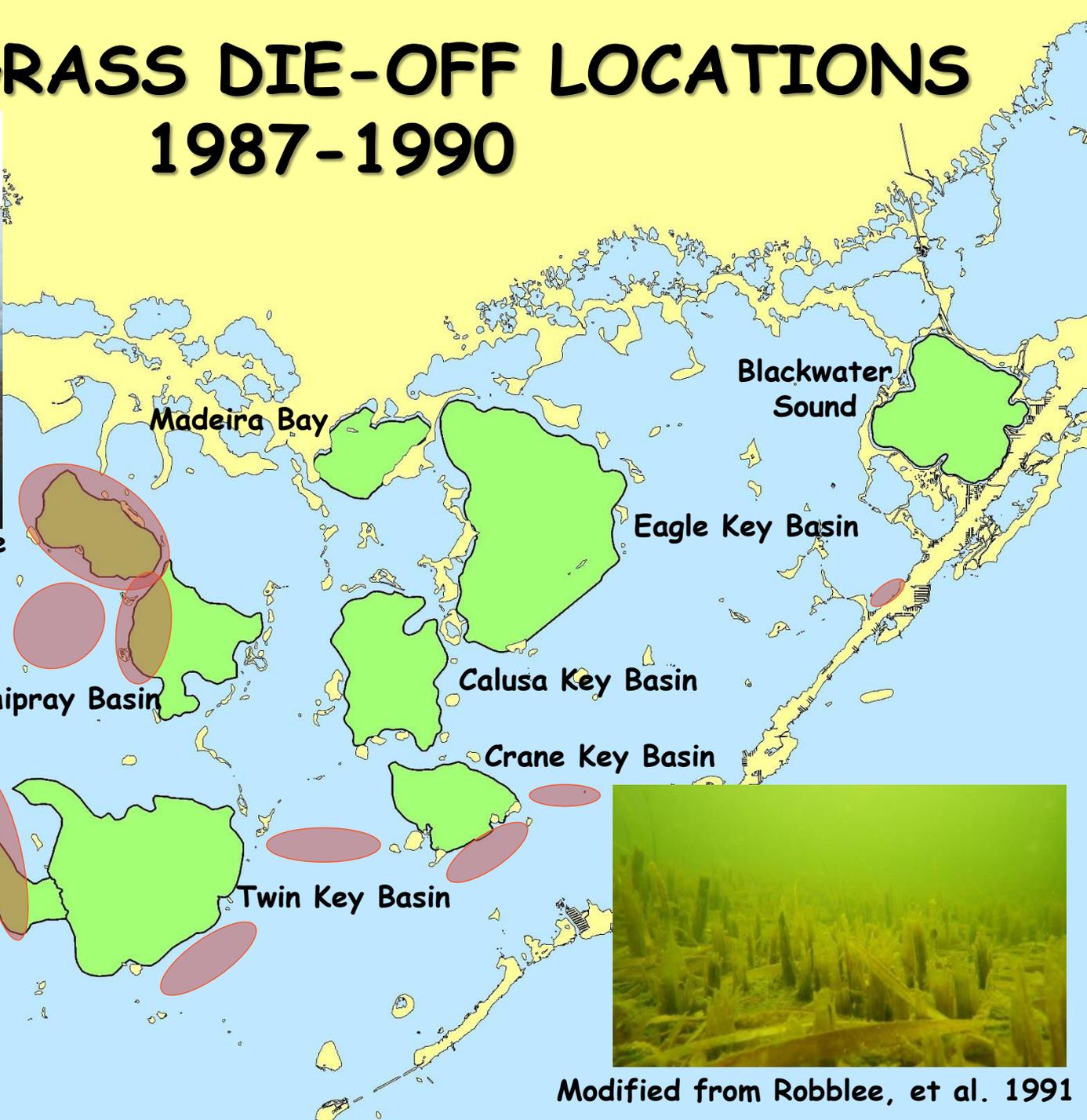
Lower water levels drive snook movement

Switch from sit & wait to cruising forager



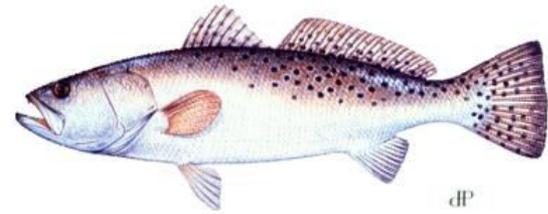
TURTLEGRASS DIE-OFF LOCATIONS 1987-1990

FHAP (P. Hall)

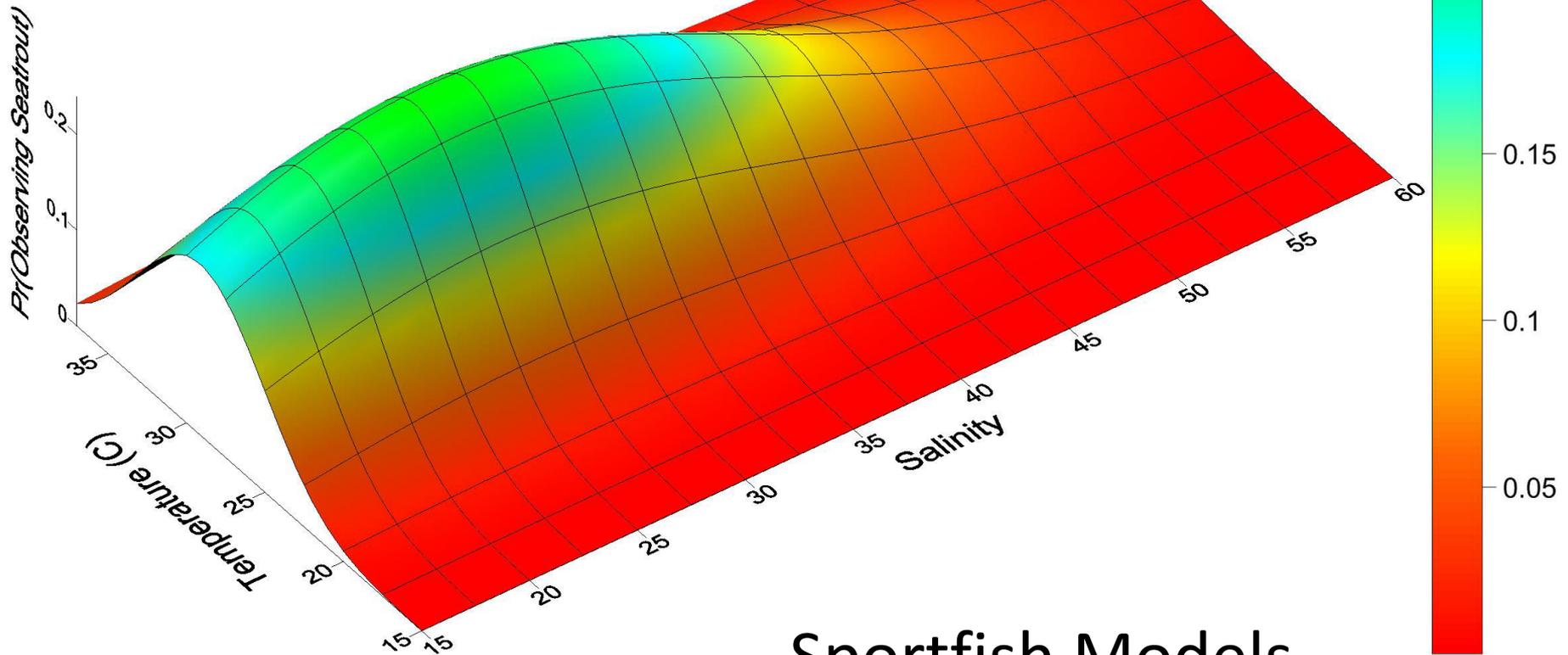


Modified from Robblee, et al. 1991

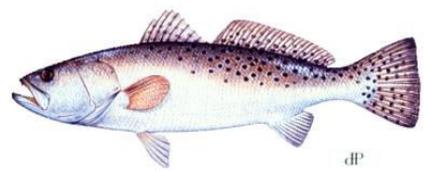
Juvenile Sportfish Monitoring (Kelble & Browder)



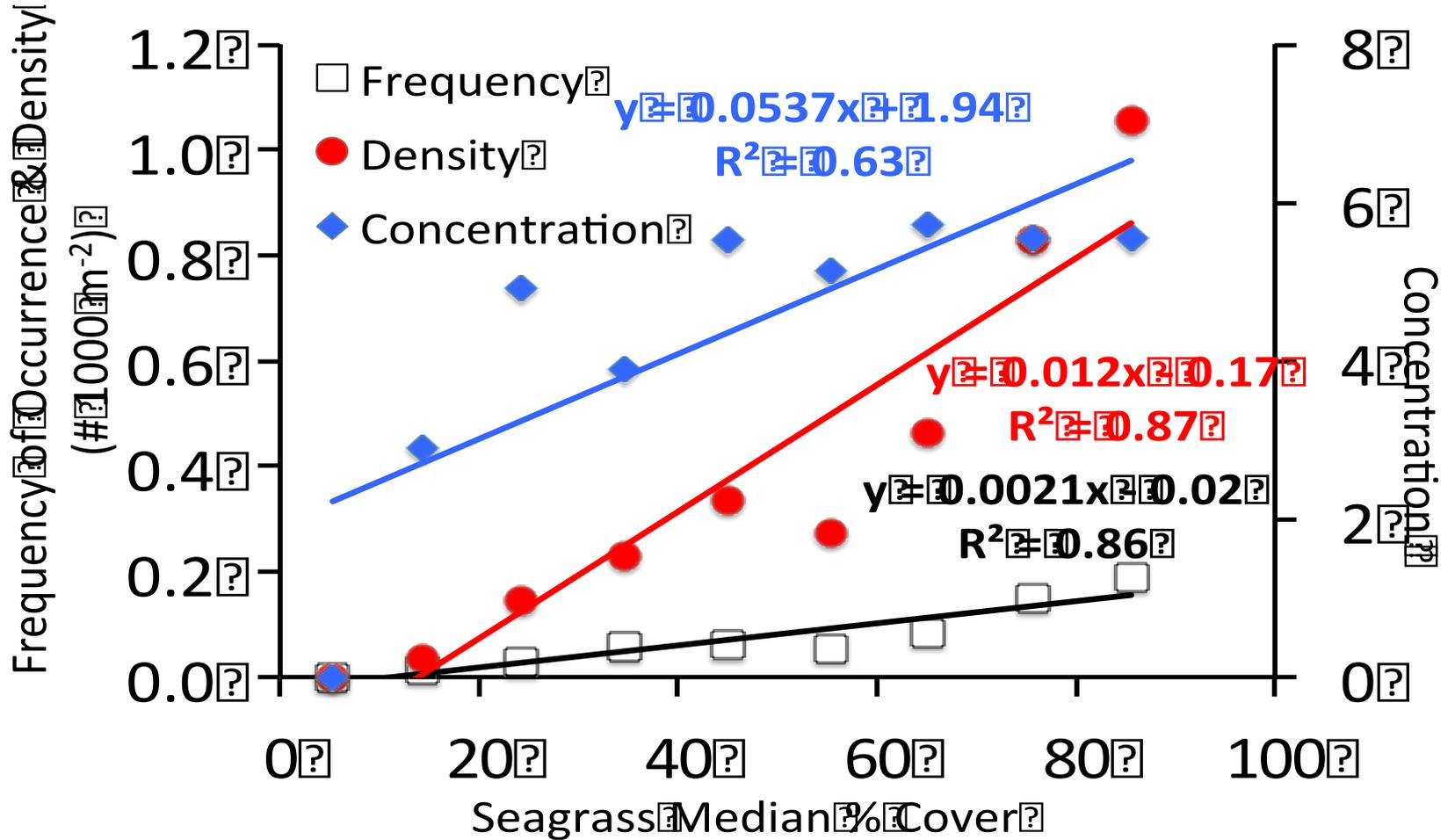
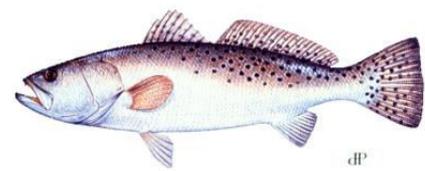
dP



Sportfish Models



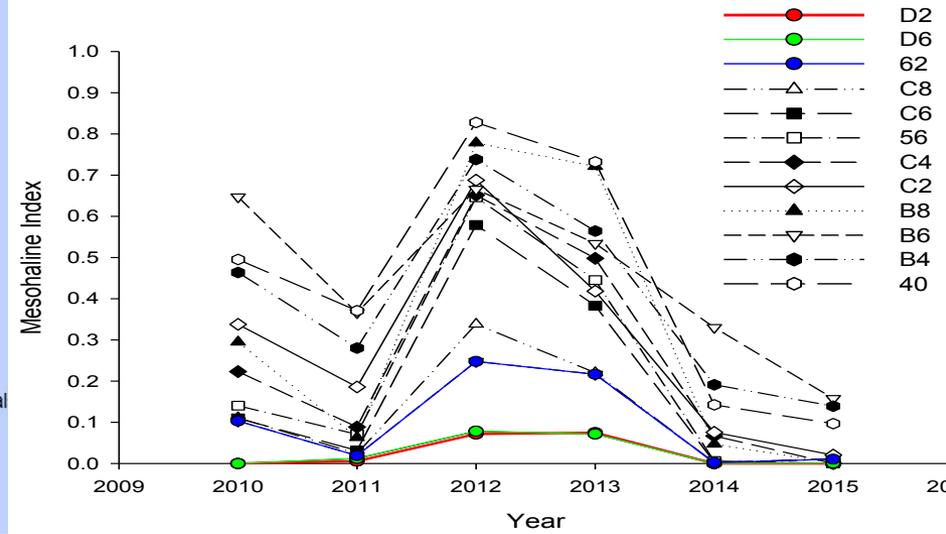
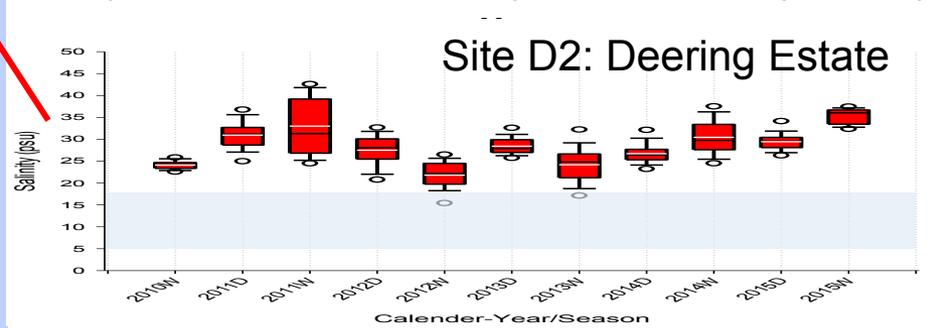
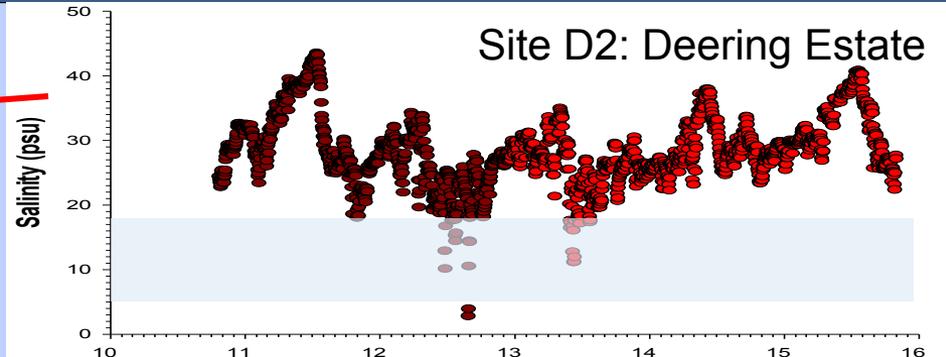
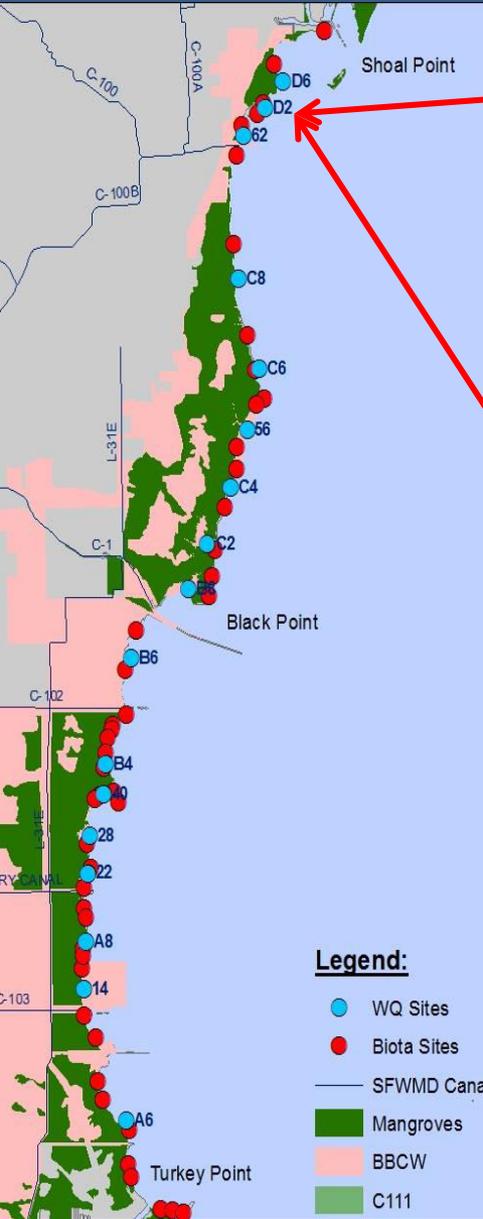
Seagrass Relationship





IBBEAM

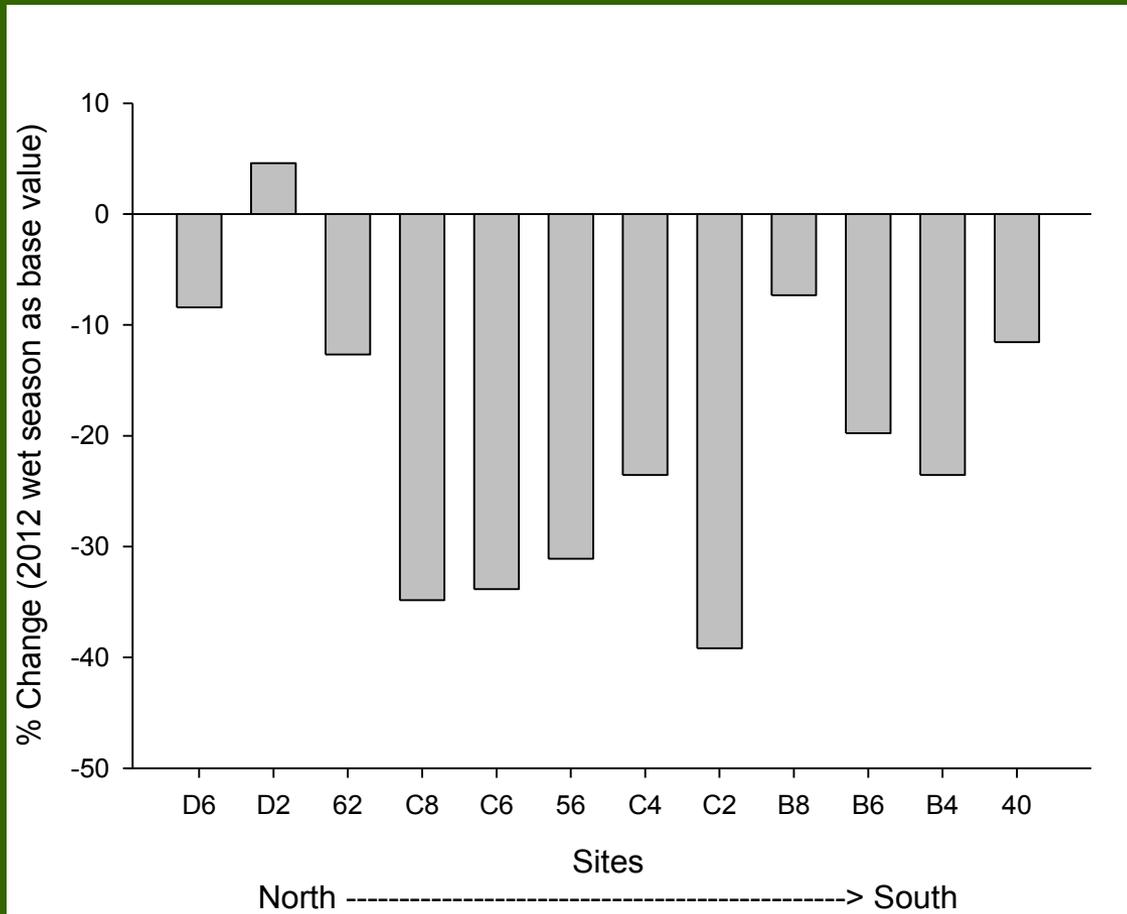
- Poor Salinity conditions Wet Season 2014 and 2015
- Improvement in 2013 noted by IBBEAM during test delivery of water to C-I, C-100, and Deering Estate Features
- Rapid Changes in salinity which return to pre-event levels over short periods of time
- Develops an estuarine zone every year which may be more or less persistent depending on operations



Wet Season Mesohaline Index Value 2010 to 2015, for all sites from Deering Estate to Black Point (D2 to B4), and one site south of Black Point (Site 40). Colored lines sites near Deering Estate.

IBBEAM Sample Sites

Wet 2013 Gain in Mesohaline Index at IBBEAM Salinity Site D2



The improvement over Wet 2012 seen in Site D2 was not seen at other IBBEAM salinity sites in Wet 2013.

No comparable improvement in Mesohaline Index at Site D2 was observed in Wet 2014 or 2015.

Two recent papers:

1. Rehage et al. 2015.
Laboratory study examining salinity preference/avoidance of the non-native African Jewelfish using methods developed by the IBBEAM team for native coastal fishes.

2. Dolan et al. 2016.
Evaluation of the statistical adequacy of the southern subset of the IBBEAM sampling domain for detecting change associated with the Turkey Point Nuclear Power Plant.



Contents lists available at ScienceDirect

Journal of Experimental Marine Biology and Ecology

journal homepage: www.elsevier.com/locate/jembe

On the mismatch between salinity tolerance and preference for an invasive fish: A case for incorporating behavioral data into niche modeling

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Environ Monit Assess (2016) 188:184

DOI 10.1007/s10661-016-5177-7

Statistical power to detect change in a mangrove shoreline fish community adjacent to a nuclear power plant

T. E. Dolan  • P. D. Lynch • J. L. Karazsia • J. E. Serafy