

# WELCOME!

# Everglades National Park

# Seagrass Workshop

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Krome Center Training Room  
Everglades National Park

**March 29, 2010**



# Workshop Outline

- Introductions
- Description of Events Leading to Concern
  - Fish kills, rafting seagrass
  - ENP small scale monitoring
  - More questions than answers...
- Workshop vision
- Presentation from experts
- Panel discussions



# Florida Bay





# Fish Kill July 21, 2009

First of several...

Reports included mullet, pinfish, mojarras, needlefish, redbfish, hard head catfish

# **Substantial Seagrass Sloughing: July 2009**



# Physical Measurements

\*Taken July 21, 2009 at 6 pm

- Low winds, little water exchange
- Temperature was extremely high:
  - 37.3 deg C (99 deg F) on the surface
  - 36.9 deg C (98 deg F) on the bottom).
- Salinity
  - 38.6 on surface
  - 40.3 on the bottom (about 2 ft deep)
- DO
  - 4.07 mg/L on the surface
  - 3.86 mg/L on the bottom

# Associated Rafting Seagrass

- Large amounts
- Unclear if this is common
- Concerns that this is a precursor to another seagrass die off event





Another Fish Kill:  
September 3, 2009  
Same Location, Smaller in Scale

# 2009 Events of Concern

- Potential Causes of Fish Kills
  - Low dissolved oxygen, high temps, light winds, borderline hypersalinity
  - Night time hypoxia
- Possibly intensified by ↑'d O<sub>2</sub> demand from decomposing seagrass
- No evidence of algal bloom or HAB

# 2009 Events of Concern

- Numerous fish kills
- Large amounts of rafting seagrasses
  - Snake Bight, Garfield Bight, and Buoy Key areas
    - Distribution/timing deviated from norms
- Possible broad trophic level impacts
  - Witnessing another seagrass die off?
- Prompted small scale monitoring plan

# State of Florida Bay

- ENP initiates small scale monitoring protocol
- Five Sites near the Fish Kill Area
  - Rankin Key, Buoy Key, Porpoise Point, Snake Bight, South side of Tin Can Channel
- Rhizome pulls
- Braun-Blaunquets
- Index of Blade Sloughing



# Florida Bay





**Flamingo  
Visitor Center**

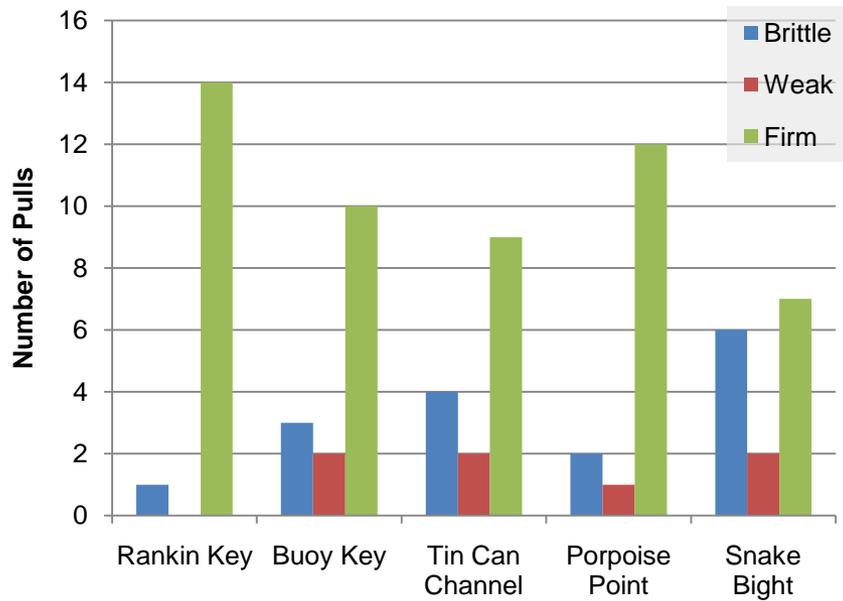


# Rhizome Pulls

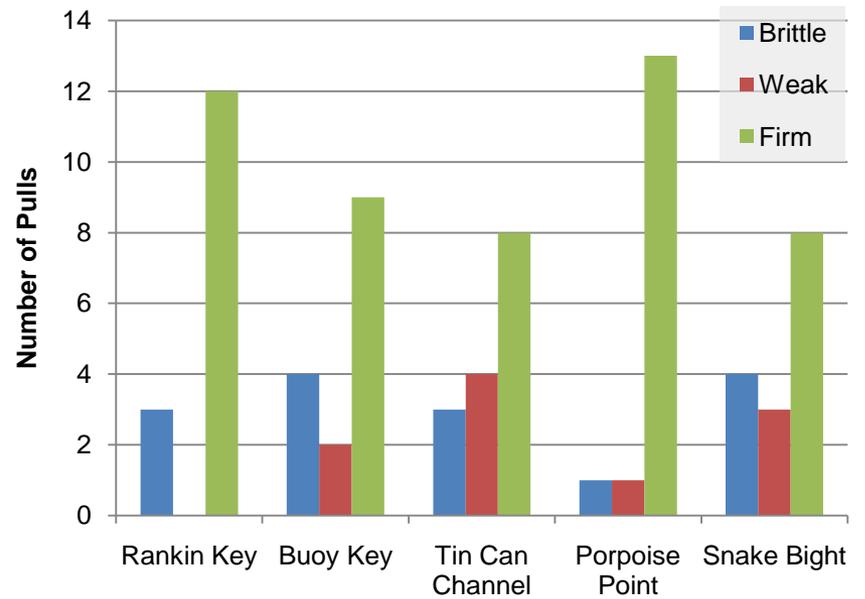
- Index of rhizome strength
  - 1 = firm/solid (healthy indicator)
  - 2 = weak (tears with strong force)
  - 3 = brittle (unhealthy – sign of die off)
- 15 pulls per site, along a fixed transect at each site
- \*\*Also – tried to conduct “Shoot Pulls”, but very few shoots pulled off during my entire sampling regime

# Rhizome Pulls

## July 2009

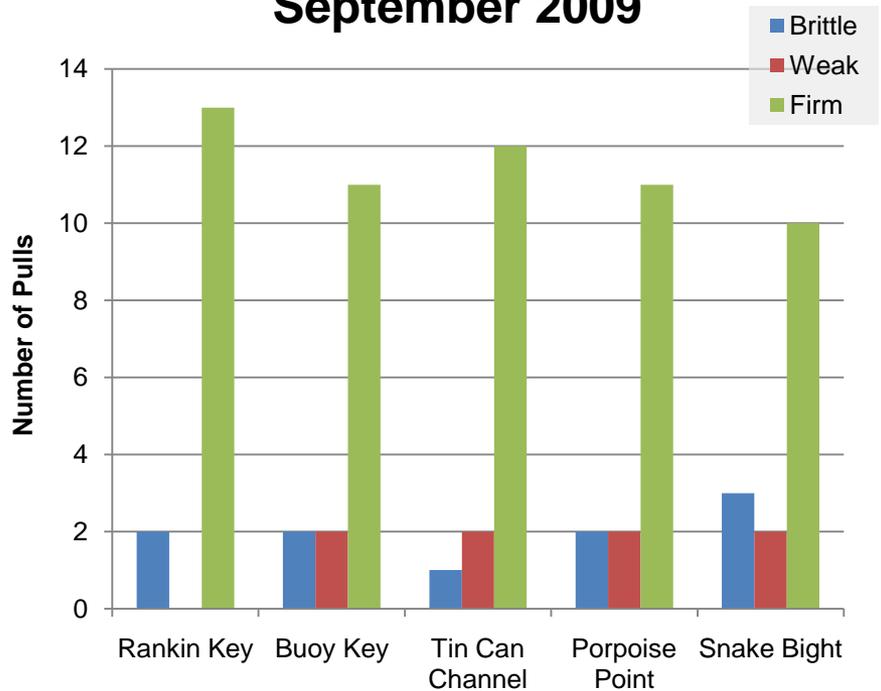


## August 2009

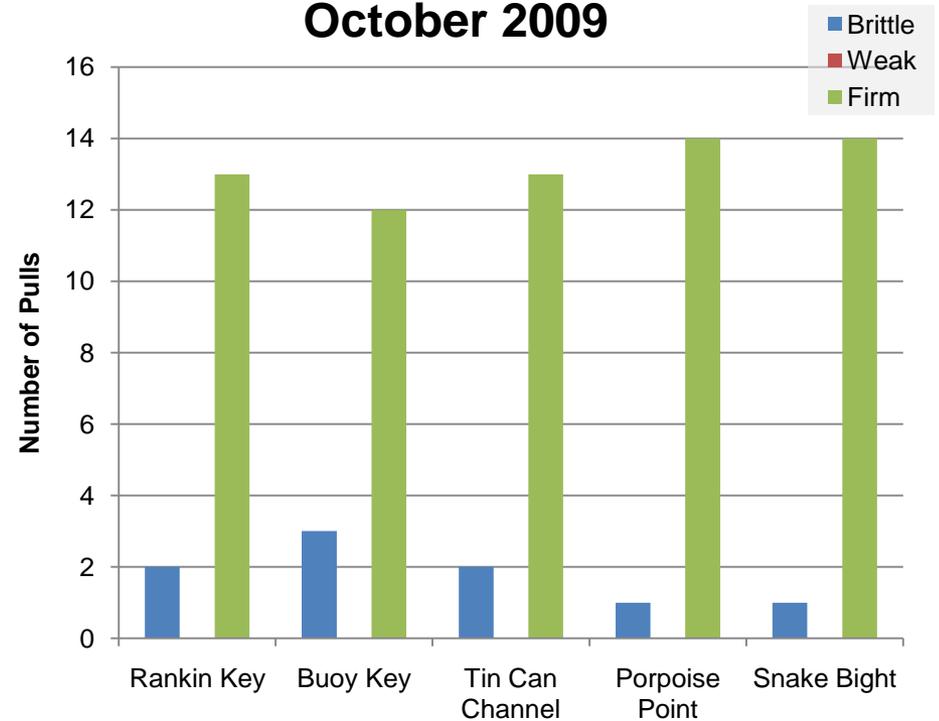


# Rhizome Pulls

## September 2009



## October 2009

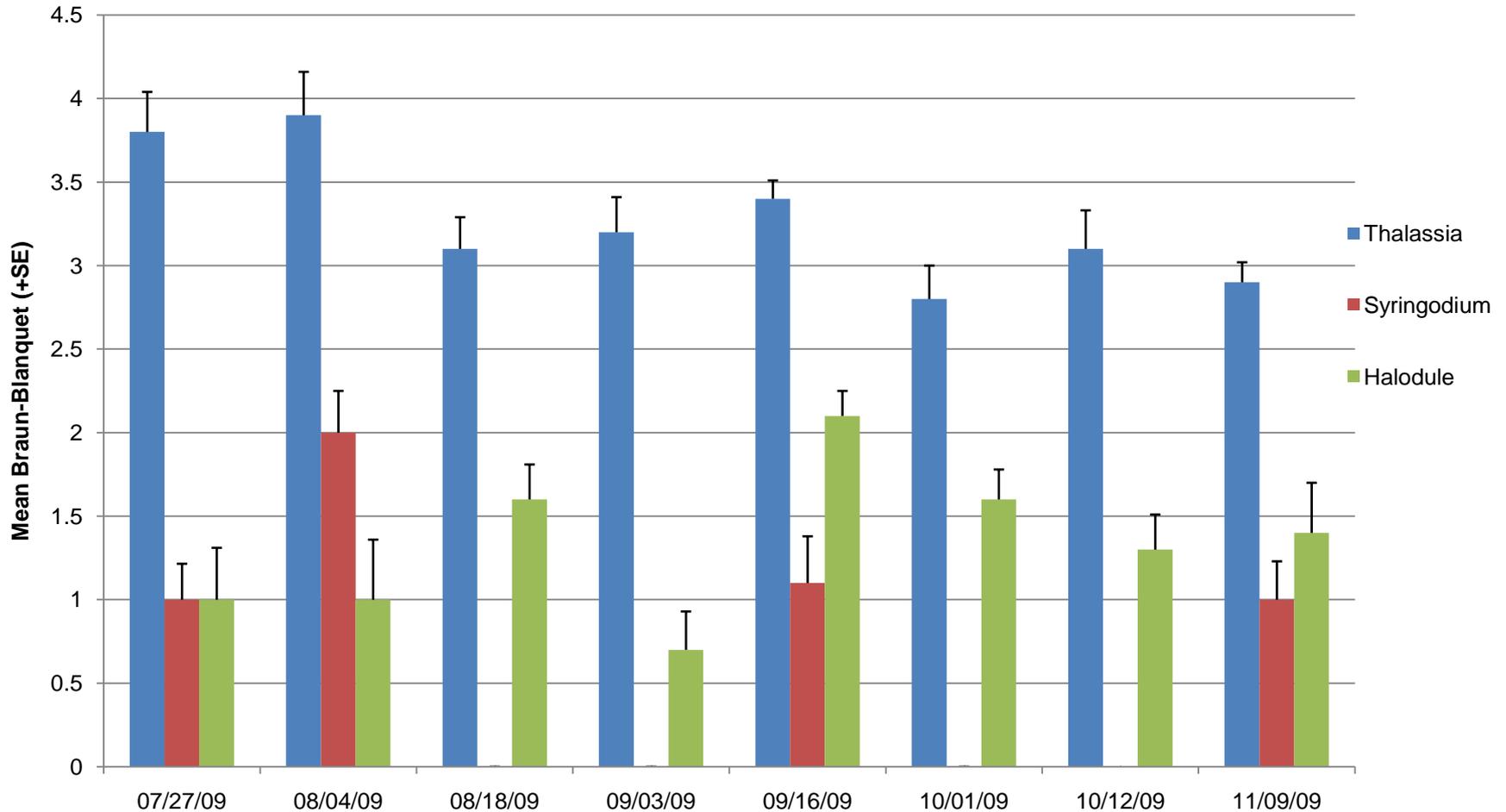


# Modified Braun-Blaunquets

- Visually quantified seagrass distribution and abundance
- Percent cover estimates per species
- 0.25m<sup>2</sup> quadrat
- BB Score (scale):
  - 0 = absent
  - 1 = 1%-5%
  - 2 = 5%-25%
  - 3 = 25%-50%
  - 4 = 50%-75%
  - 5 = 75%-100%

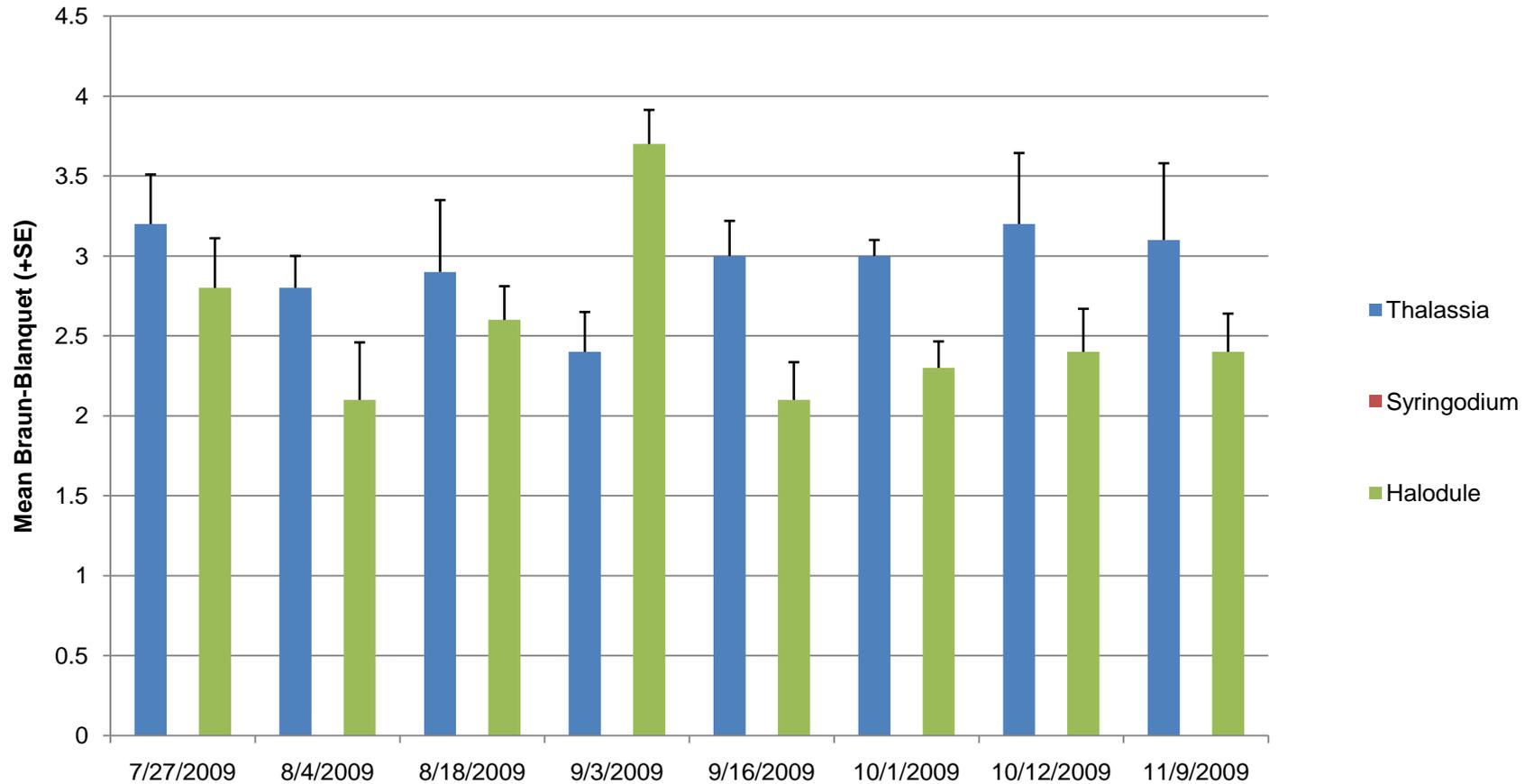
# Modified Braun-Blanquet

## Rankin Key



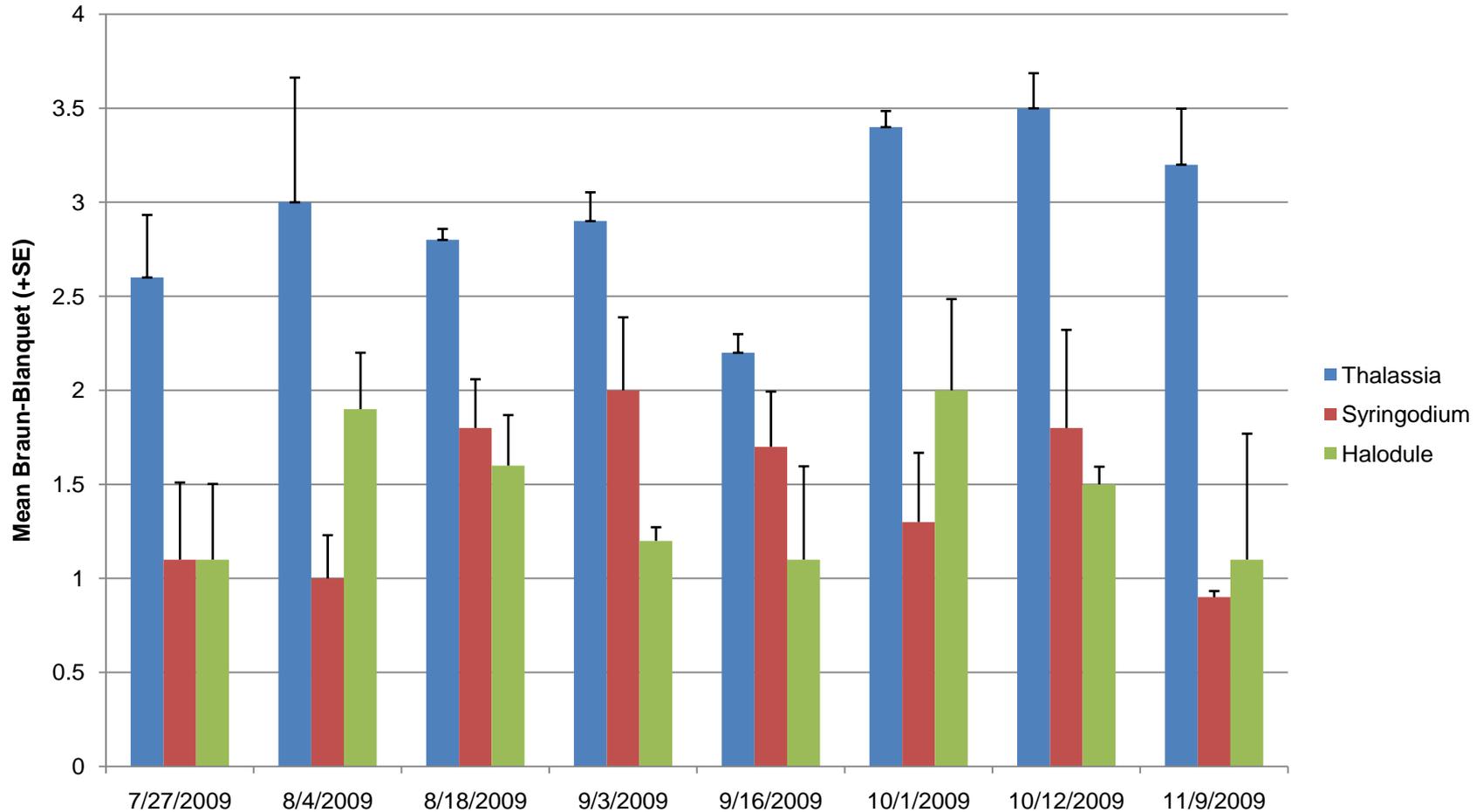
# Modified Braun-Blanquets

## Buoy Key



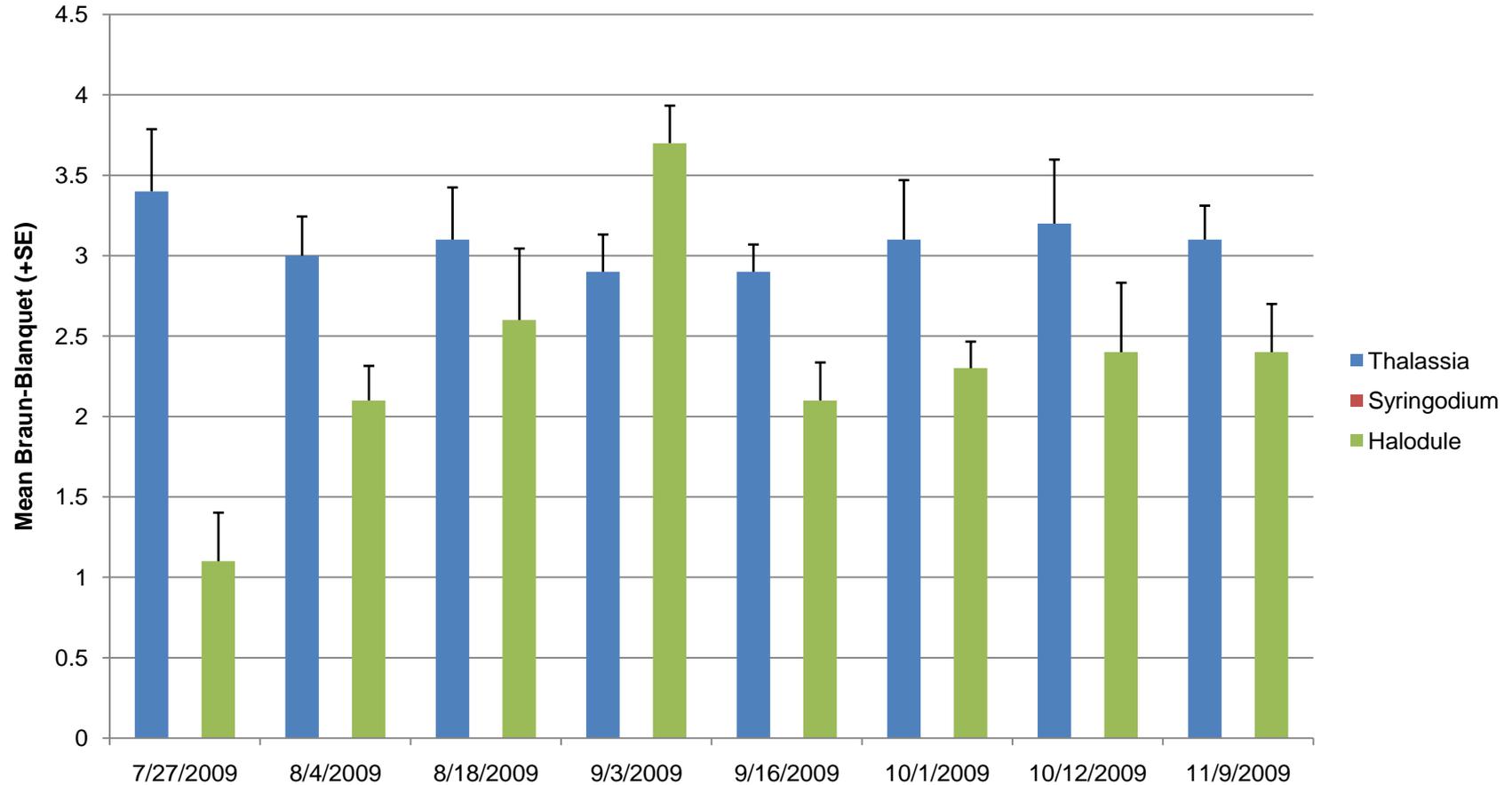
# Modified Braun-Blanquets

## Porpoise Point



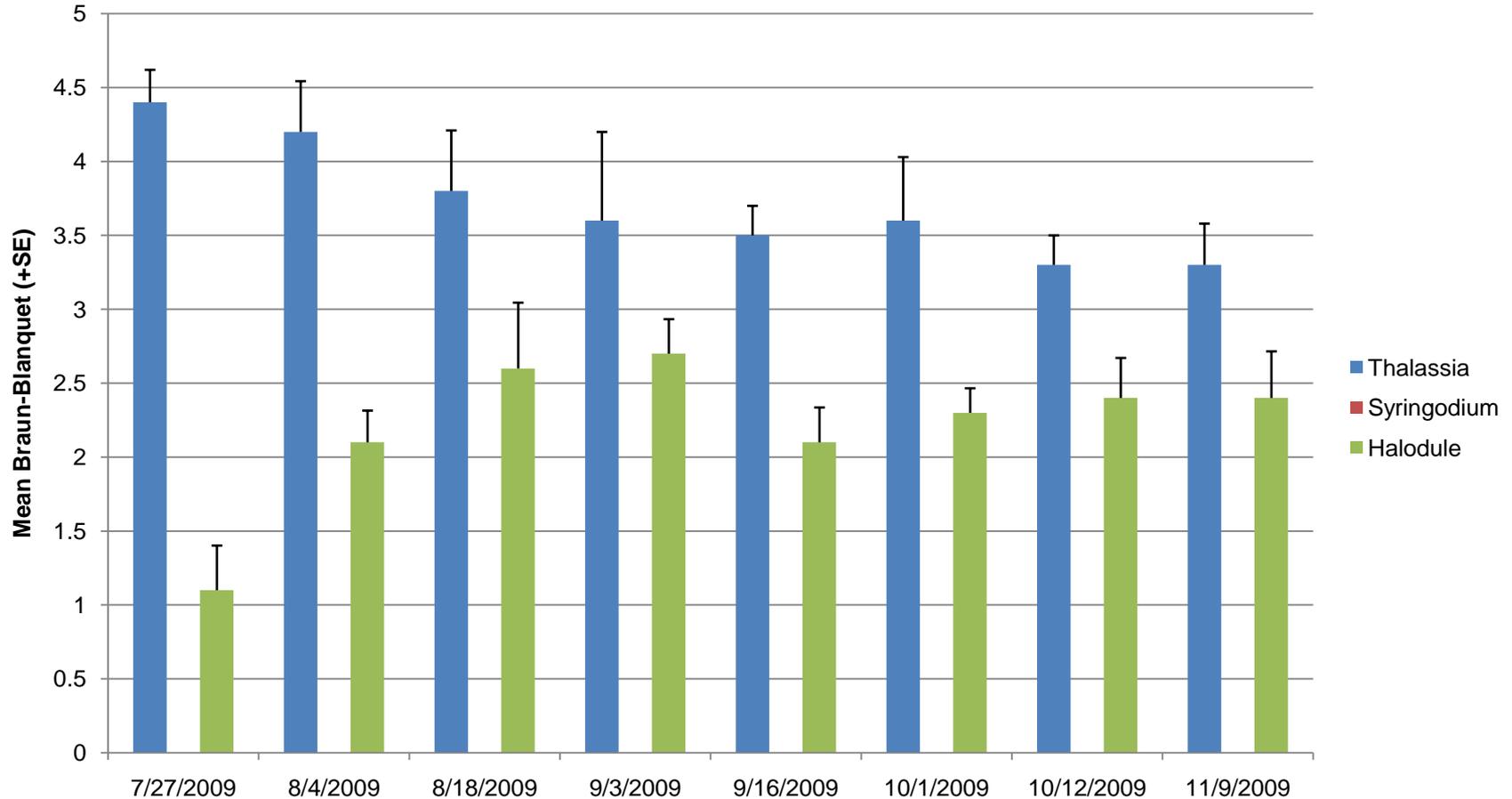
# Modified Braun-Blanquets

## Tin Can Channel



# Modified Braun-Blanquet

## Snake Bight



# Index of Blade Sloughing

- Same sites
- Ran transect tapes over floating seagrass blades (fixed one end with PVC)
- Counted 5 - 10 m transects
- Tape strung tight across the area
- Recorded the beginning and endpoints of vegetation
- Calculated percent cover

# Index of Blade Sloughing

<b>July 2009 Site</b>	<b>Transect Length</b>	<b>Total % Cover</b>
<b>Rankin Key</b>	10 m	42.4 %
<b>Buoy Key</b>	10 m	45.1 %
<b>Porpoise Point</b>	10 m	75.8 %
<b>Snake Bight</b>	10 m	77.6 %
<b>Tin Can Channel</b>	10 m	59.2 %

<b>August 2009 Site</b>	<b>Transect Length</b>	<b>Total % Cover</b>
<b>Rankin Key</b>	10 m	36.1 %
<b>Buoy Key</b>	10 m	41.6 %
<b>Porpoise Point</b>	10 m	63.2 %
<b>Snake Bight</b>	10 m	68.4 %
<b>Tin Can Channel</b>	10 m	48.1 %

# Index of Blade Sloughing

<b>Sept 2009 Site</b>	<b>Transect Length</b>	<b>Total % Cover</b>
<b>Rankin Key</b>	10 m	23.1 %
<b>Buoy Key</b>	10 m	22.1 %
<b>Porpoise Point</b>	10 m	34.7 %
<b>Snake Bight</b>	10 m	44.7 %
<b>Tin Can Channel</b>	10 m	46.0 %

<b>Oct 2009 Site</b>	<b>Transect Length</b>	<b>Total % Cover</b>
<b>Rankin Key</b>	10 m	9.0 %
<b>Buoy Key</b>	10 m	11.7 %
<b>Porpoise Point</b>	10 m	21.1 %
<b>Snake Bight</b>	10 m	8.2 %
<b>Tin Can Channel</b>	10 m	7.3 %

# State of Seagrass in West FL Bay

- Rhizome pulls indicate that grass is healthy
- No significant changes in seagrass % cover or distribution



# Historical Reports are Limited

- Several efforts to find information in literature
- “Causes of fish kills in Flamingo...” abstract
  - Fall 1990: 3 fish kills reported in Snake Bight
  - 38 fish kills have occurred in ENP (1944-1990)
    - 31 occurred between March & November
    - 7 due to cold snaps
      - Over ½ of fish kills in Florida or Whitewater Bays
      - 24% of fish kills in Snake Bight area alone
- Information is limited
- Organize a workshop!



# Life Cycle Dynamics of Dieback

- What are the causes of seagrass sloughing?
- What stressors induce abnormal sloughing?
- How much sloughing is considered “normal”?
- What time of year does this normally occur?

# Workshop Vision

- Learn from experts
- Open discussions - panel session
- Expand our in-house monitoring efforts
- List priorities for short- and long-term science needs



# Workshop Vision

- Discuss recent developments in Florida Bay
- Answer questions associated with seagrass community health
- Promote investigations that will refine models for seagrass dieback, improve the understanding of seagrass leaf dynamics, and the broader trophic effects of seagrass dieback events
- Understand the biology of the seagrass community, including the range of natural variation



A close-up, slightly blurred photograph of a dense field of green grass. The blades are long and narrow, with some showing signs of wear or discoloration. The overall color is a vibrant green. Overlaid in the center of the image is the text "Any Questions?" in a large, white, sans-serif font.

Any Questions?