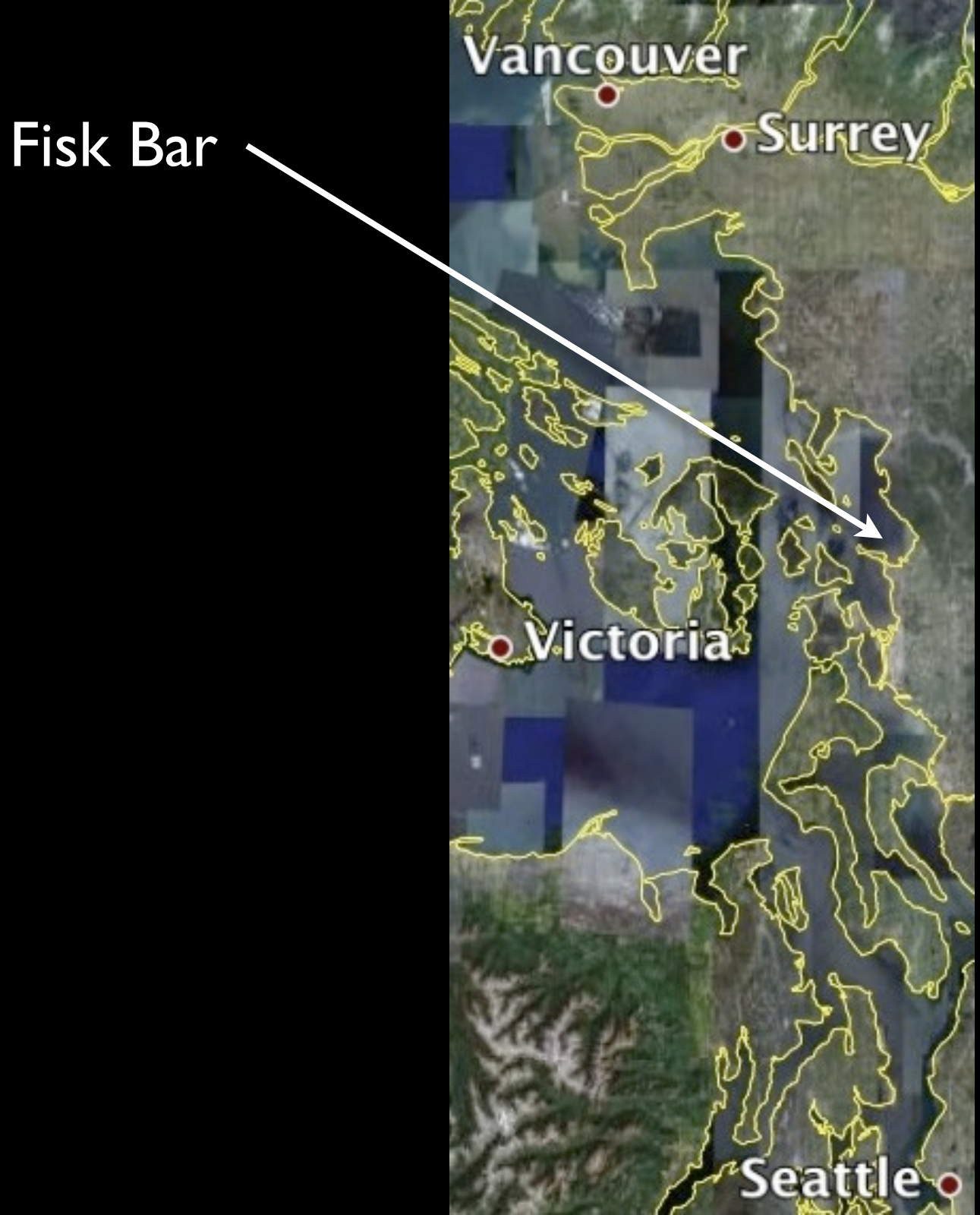
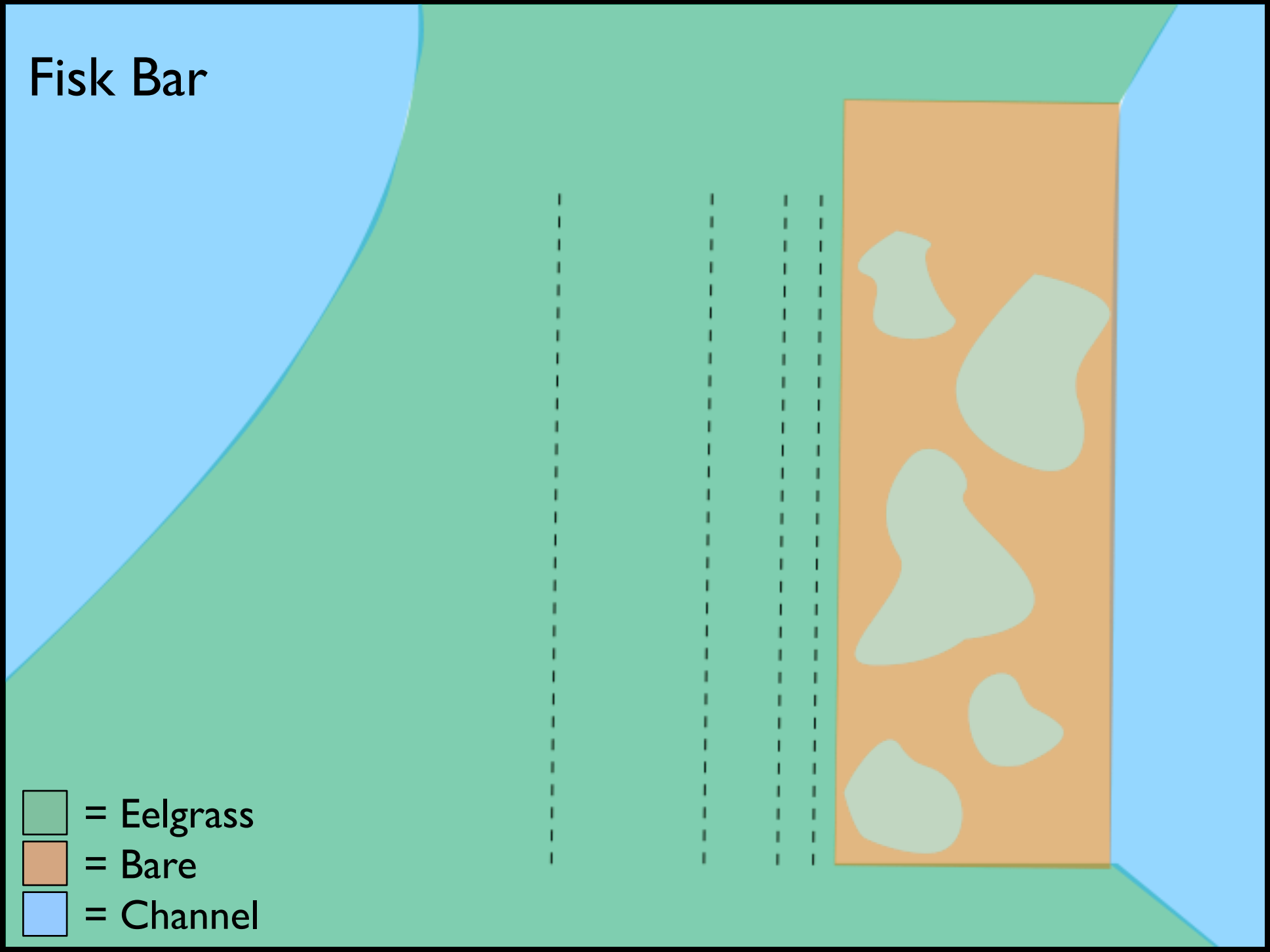
Resilience of Soft-Sediment Communities after Geoduck Harvest in Samish Bay, Washington

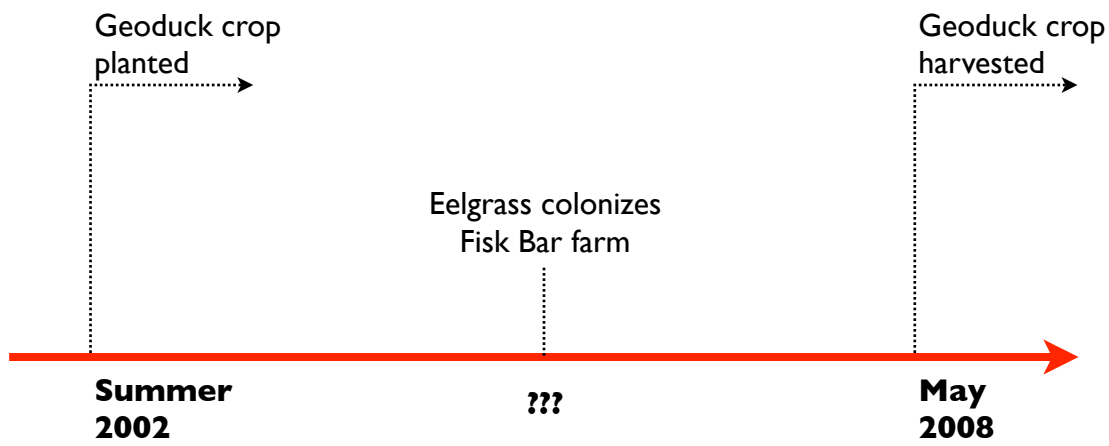
Micah Horwith, Department of Biology, University of Washington


Fisk Bar
Vancouver
Surrey
Victoria
Seattle


Fisk Bar
= Eelgrass
= Bare
= Channel

Timeline

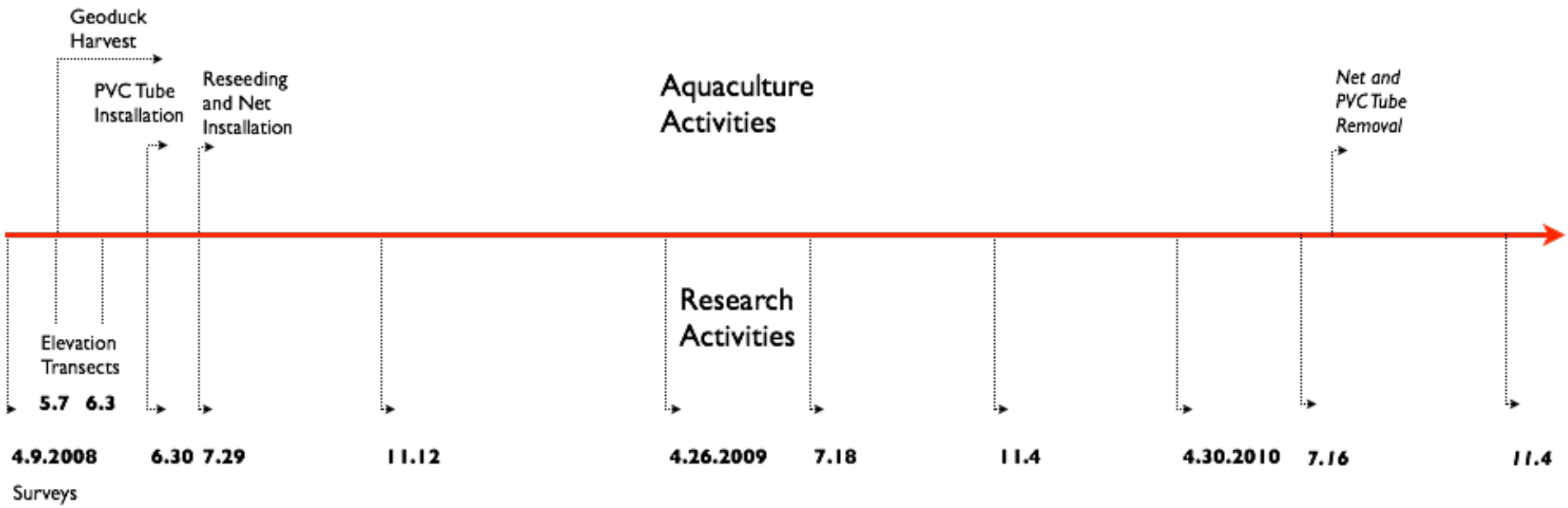
I - Pre-harvest



Timeline

1 - Pre-harvest

2 - Post-harvest



Geoduck harvest

May 2008

Tube installation

June 2008

Net installation

July 2008

How does geoduck farming affect eelgrass?

How does geoduck farming affect eelgrass?

1 - Reduced size

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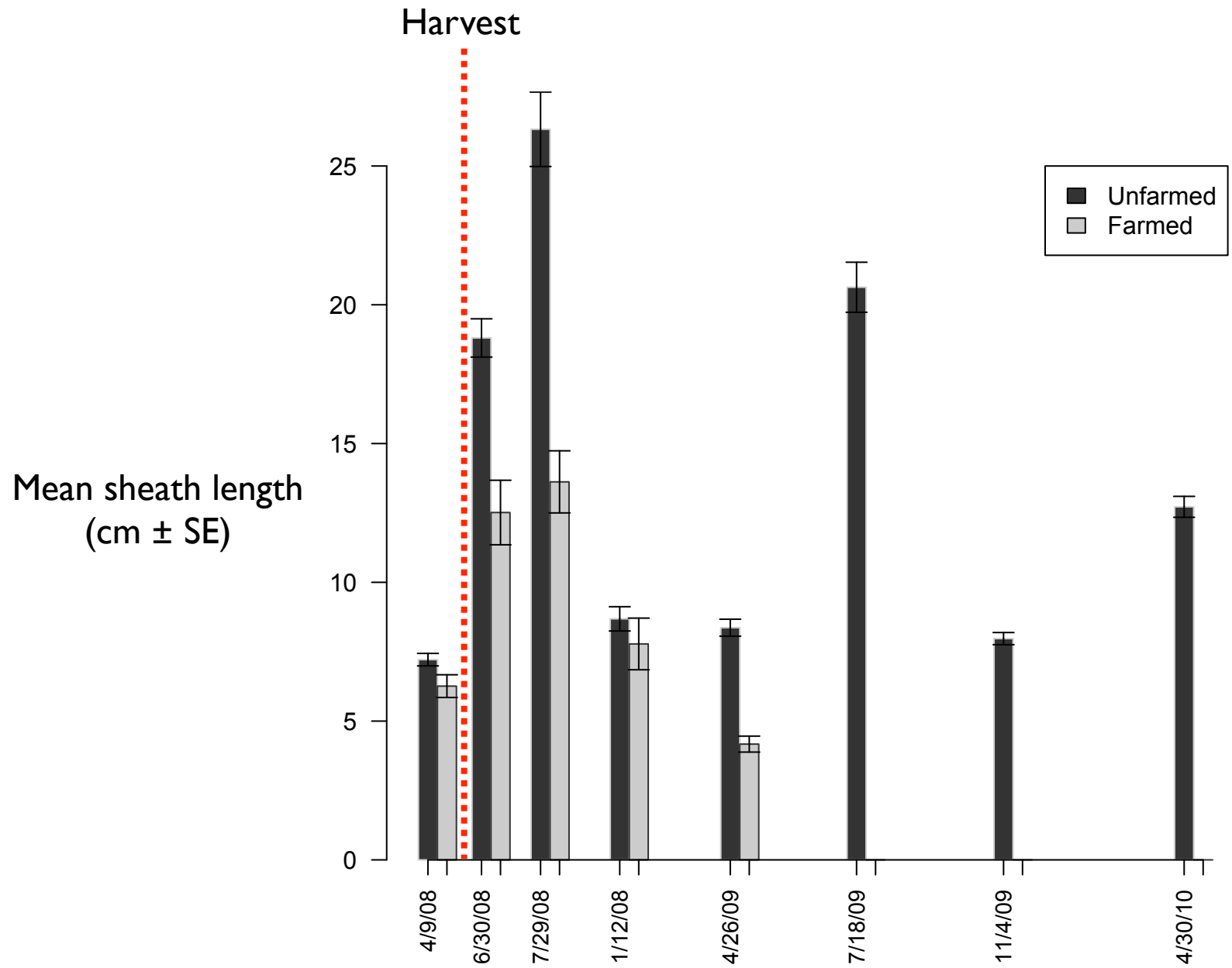
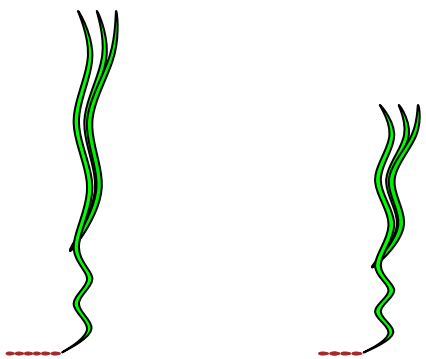
1 - Reduced size



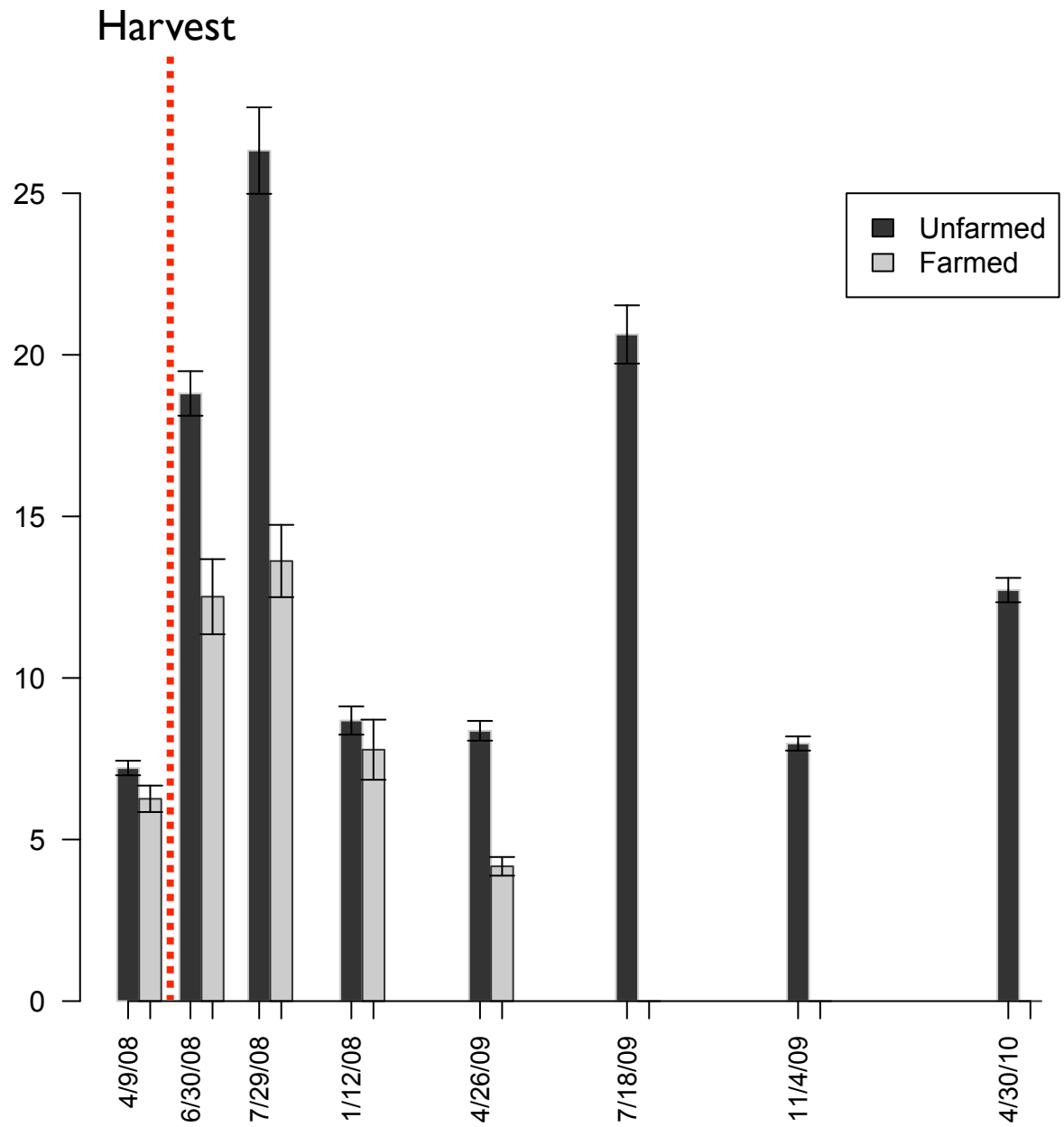
How does geoduck farming affect eelgrass?

1 - Reduced size

Unfarmed Farmed

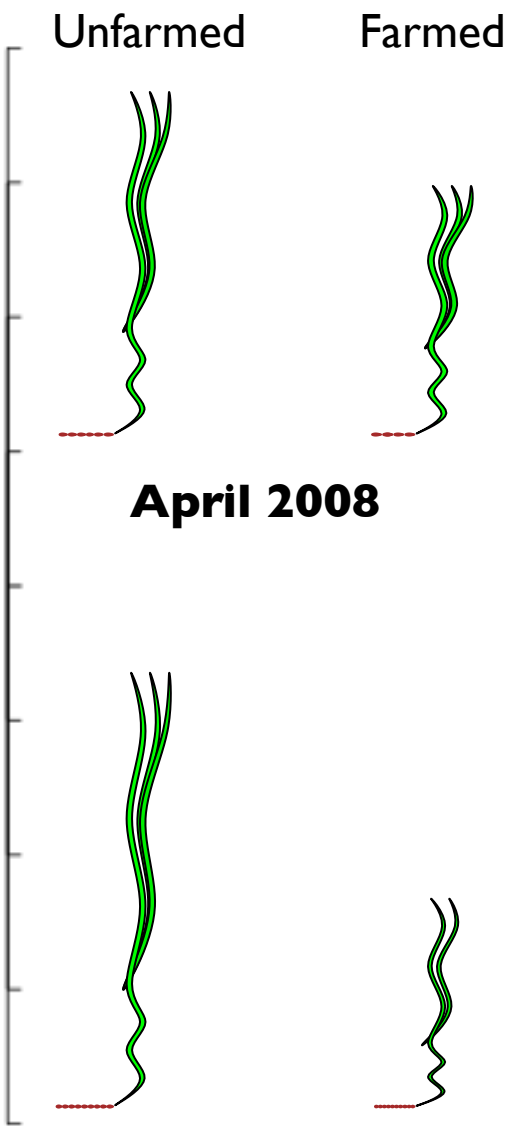


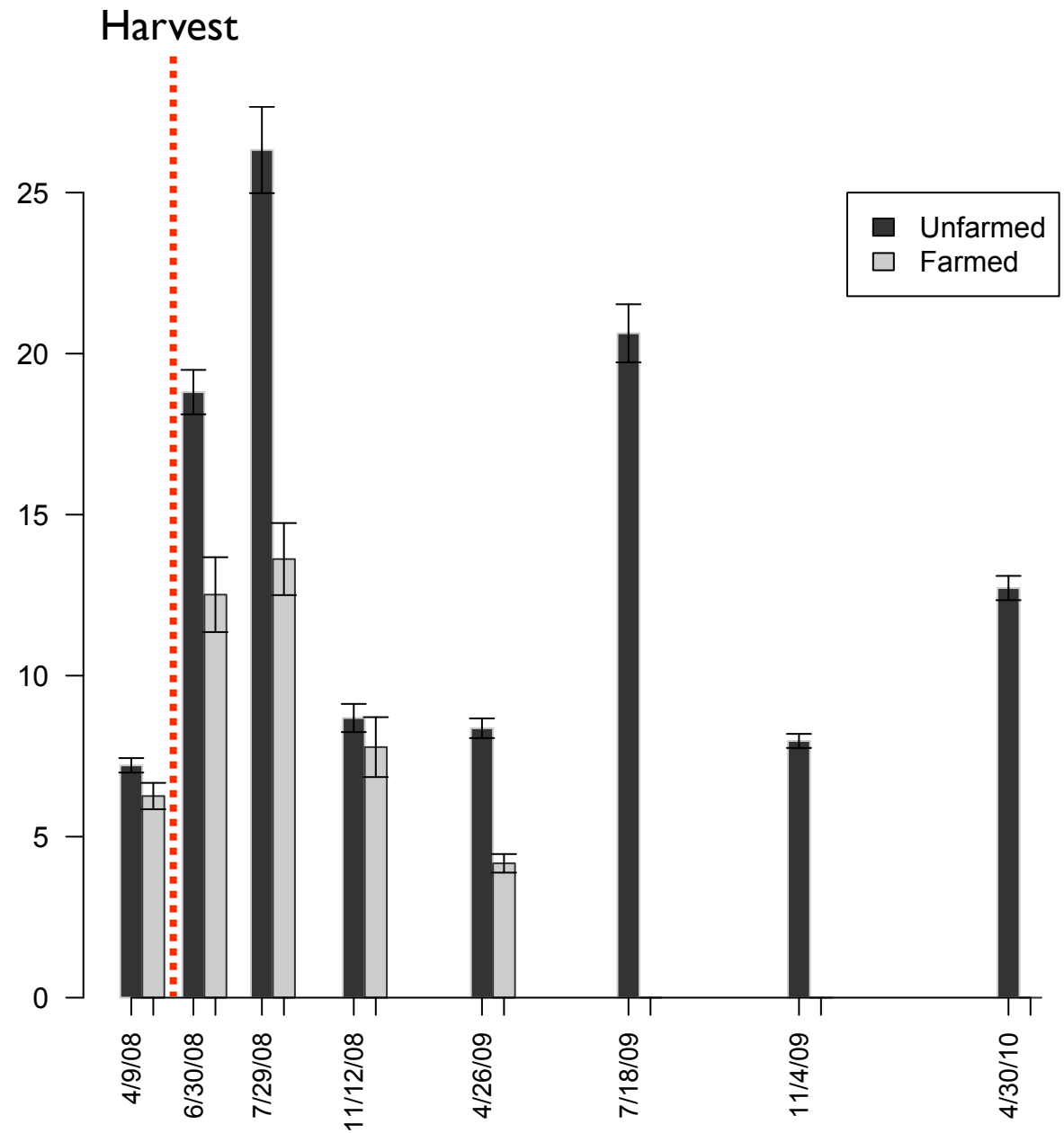
April 2008



How does geoduck farming affect eelgrass?

1 - Reduced size





How does geoduck farming affect eelgrass?

1 - Reduced size

2 - Reduced reproductive activity

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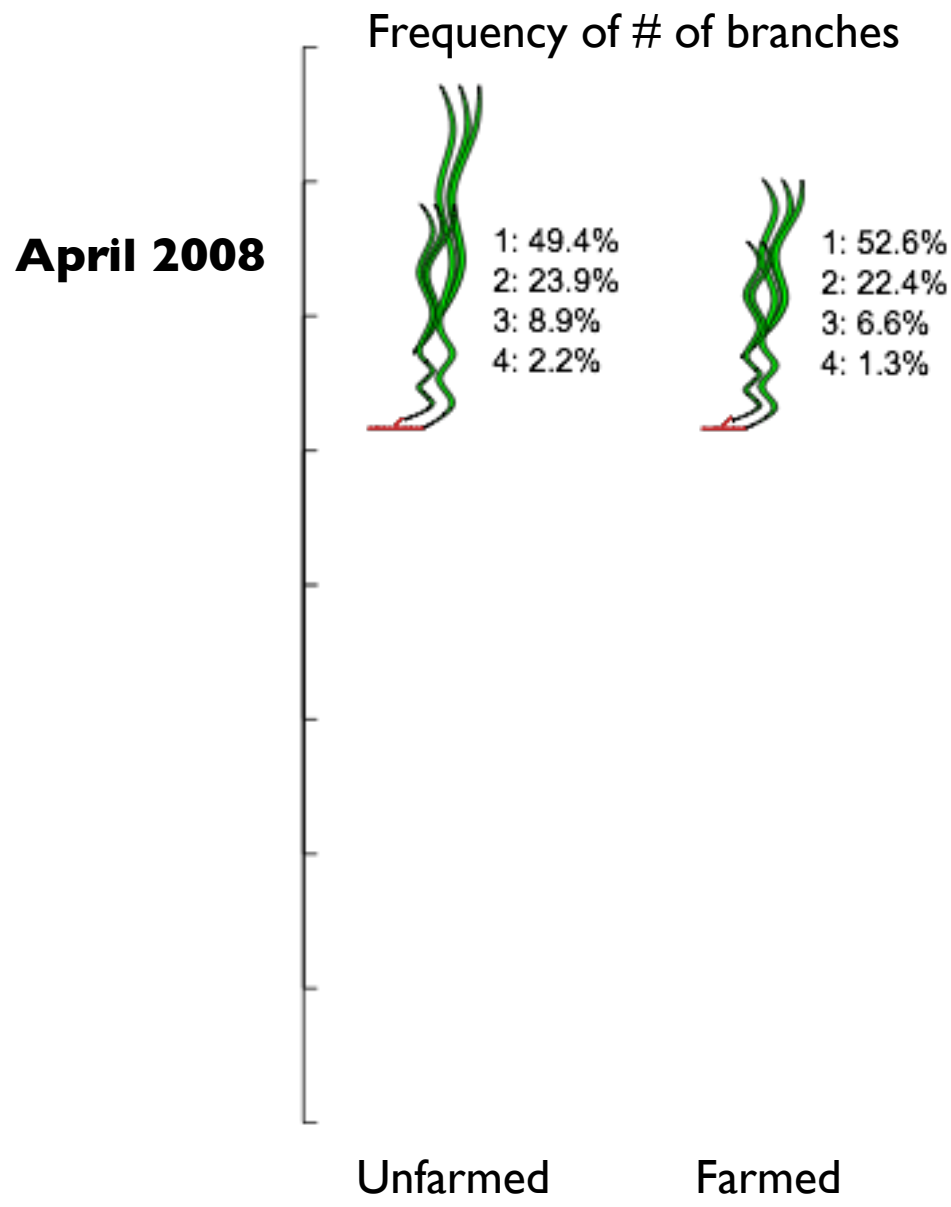

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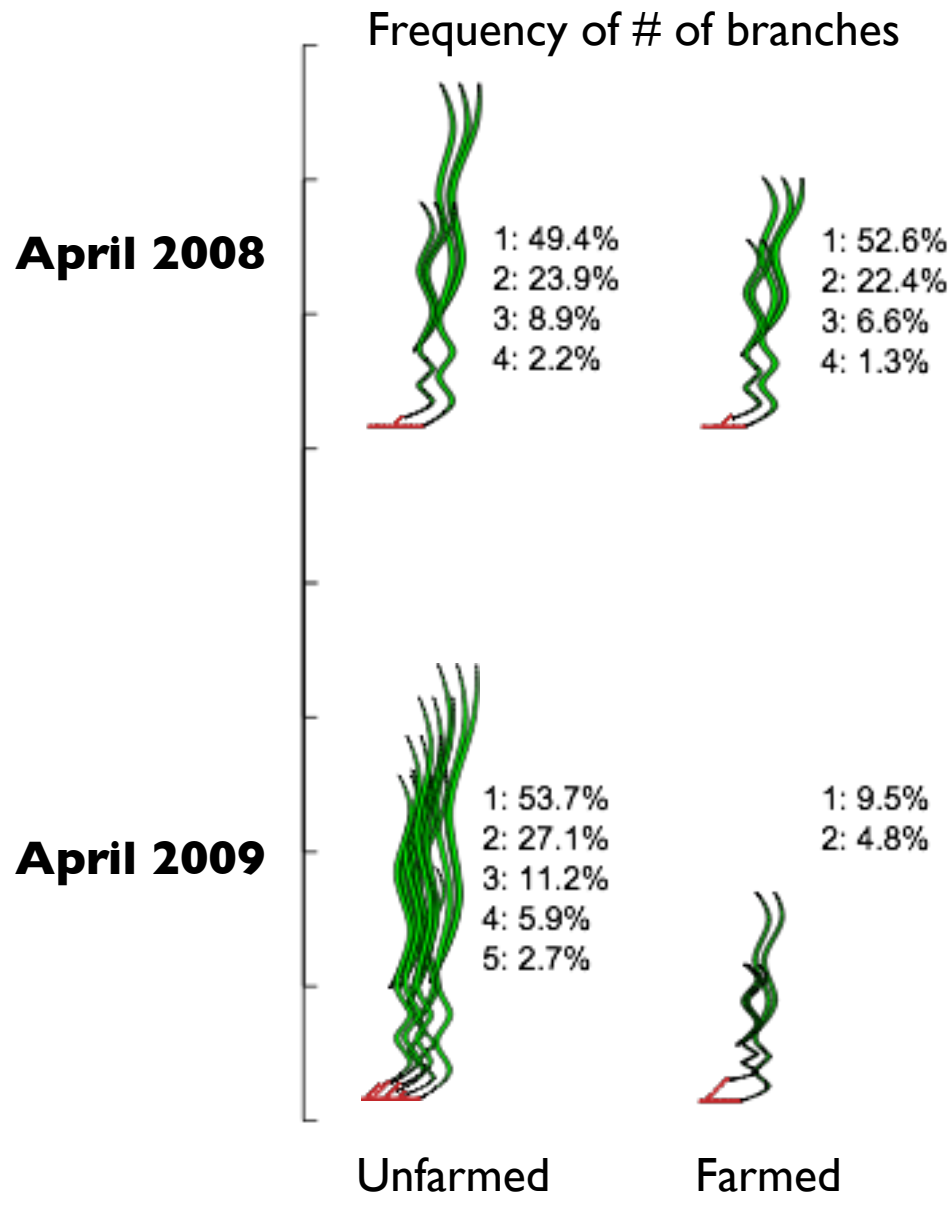


How does geoduck farming affect eelgrass?

1 - Reduced size

2 - Reduced reproductive activity

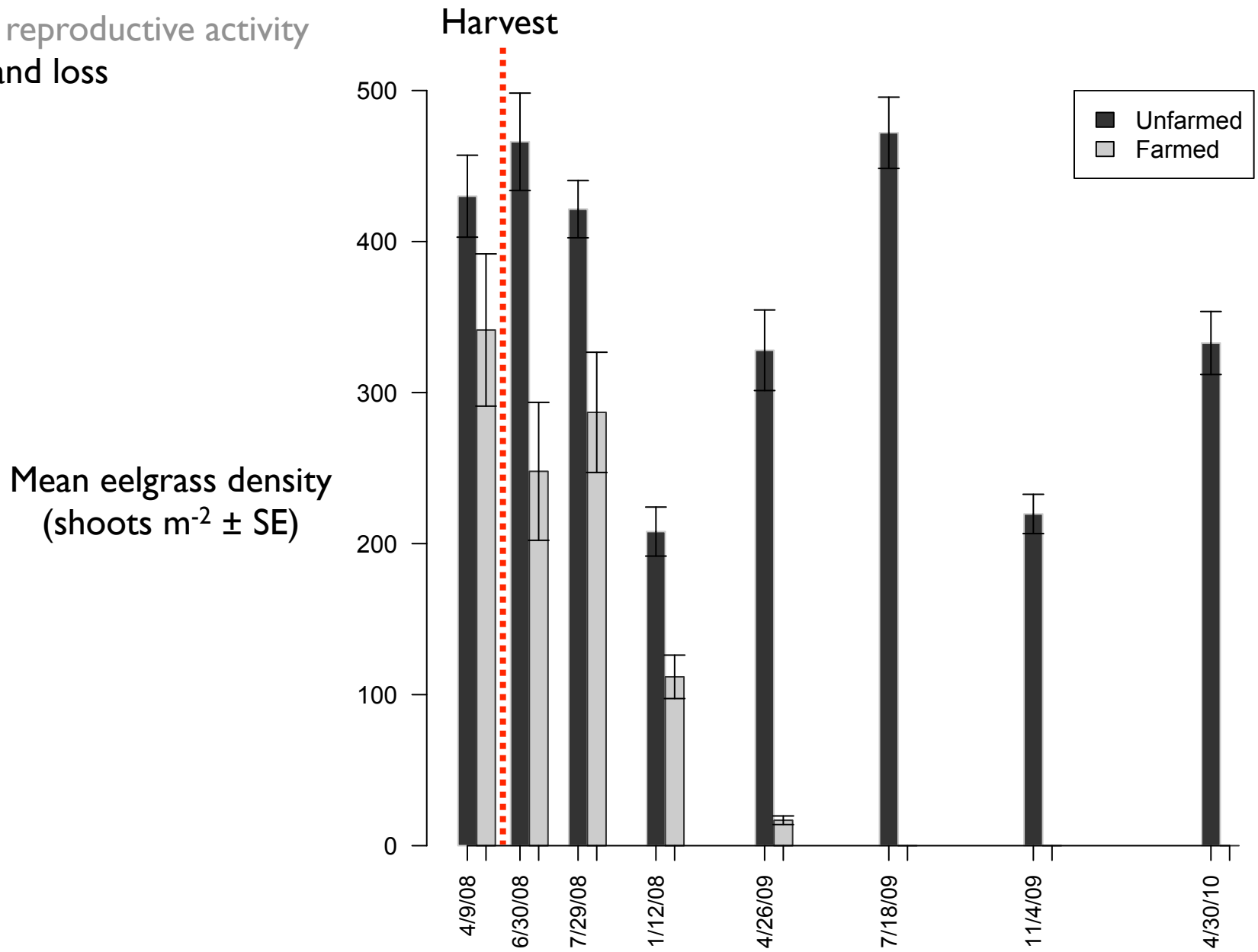
3 - Decline and loss

How does geoduck farming affect eelgrass?

1 - Reduced size

2 - Reduced reproductive activity

3 - Decline and loss



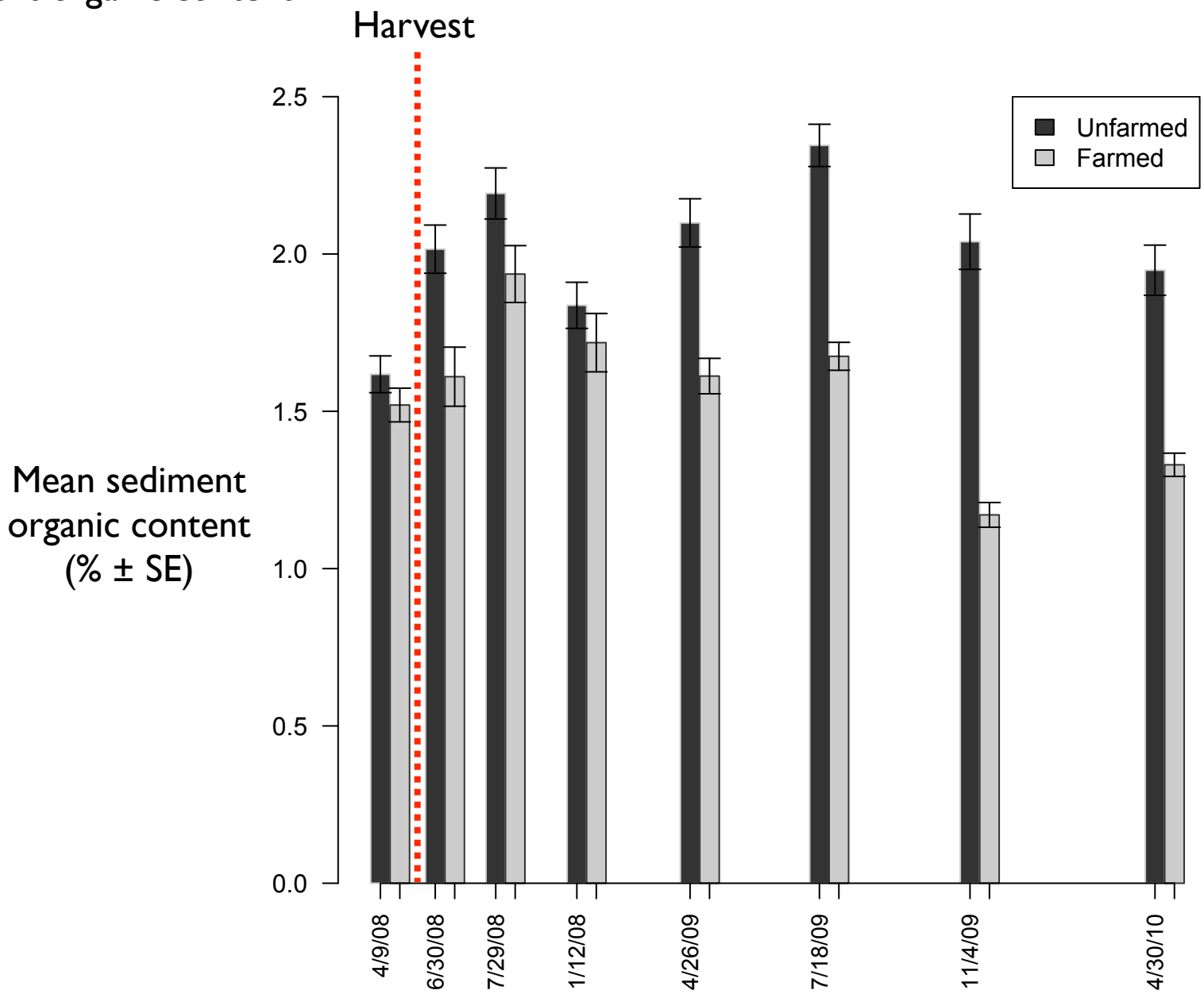
How does geoduck farming affect sediment?

How does geoduck farming affect sediment?

1 - Reduced sediment organic content

How does geoduck farming affect sediment?

1 - Reduced sediment organic content



How does geoduck farming affect sediment?

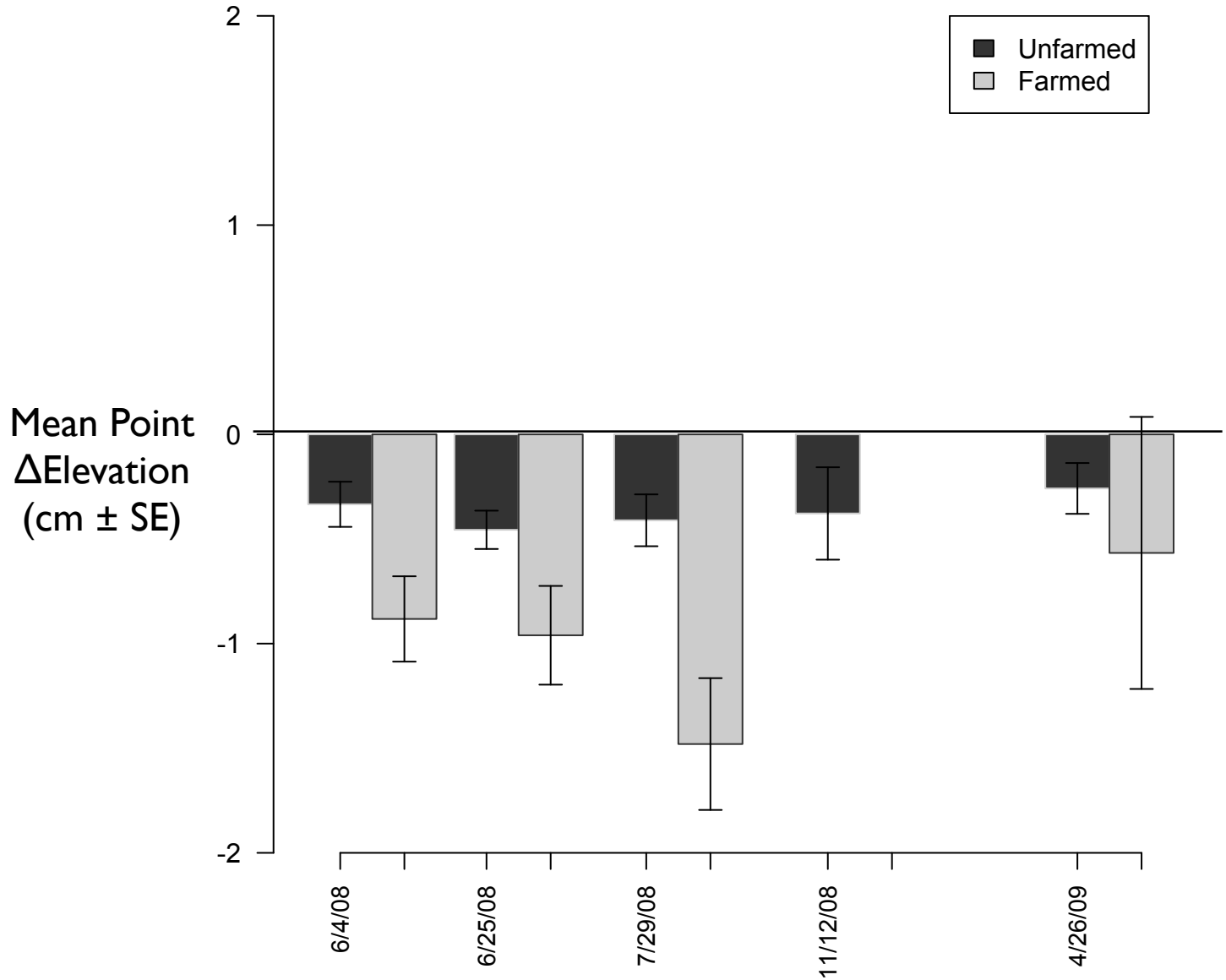
1 - Reduced sediment organic content

2 - Elevation loss and recovery

How does geoduck farming affect sediment?

1 - Reduced sediment organic content

2 - Elevation loss and recovery



Does geoduck farming have ‘spillover’ effects?

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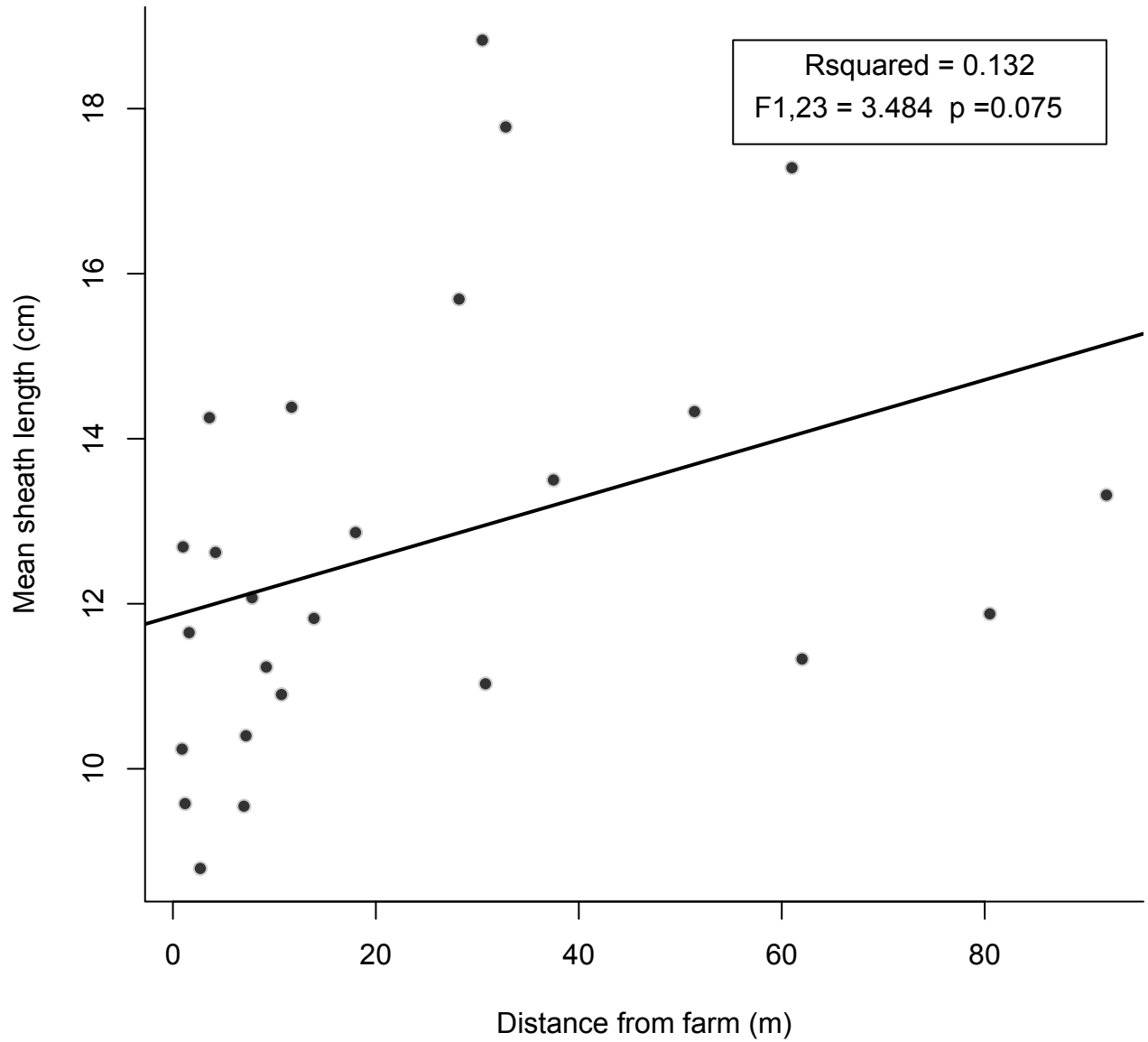
1 - Reduced eelgrass size near farm

Does geoduck farming have 'spillover' effects?

1 - Reduced eelgrass size near farm

4/9/08
6/30/08
7/29/08
11/12/08
4/26/09
7/18/09
11/4/09
4/30/10



Does geoduck farming have ‘spillover’ effects?

1 - Reduced eelgrass size near farm

2 - Increased eelgrass density near farm

Does geoduck farming have 'spillover' effects?

1 - Reduced eelgrass size near farm

2 - Increased eelgrass density near farm

4/9/08
6/30/08
7/29/08
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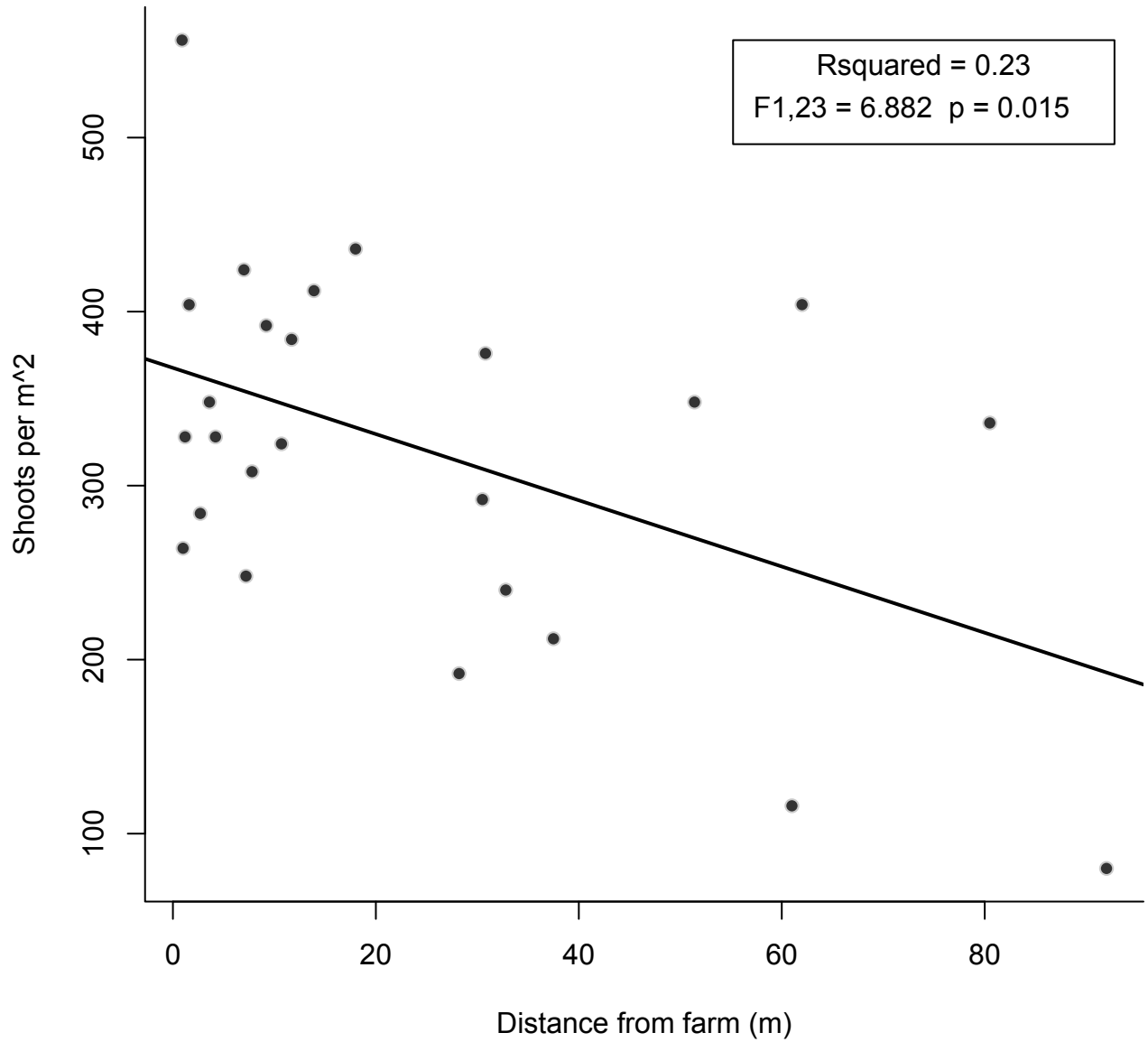
4/26/09
7/18/09
11/4/09
4/30/10



Does geoduck farming have 'spillover' effects?

1 - Reduced eelgrass size near farm

2 - Increased eelgrass density near farm

3 - Possible increased sediment organic content, reduced standing biomass near farm

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1 - Reduced eelgrass size near farm

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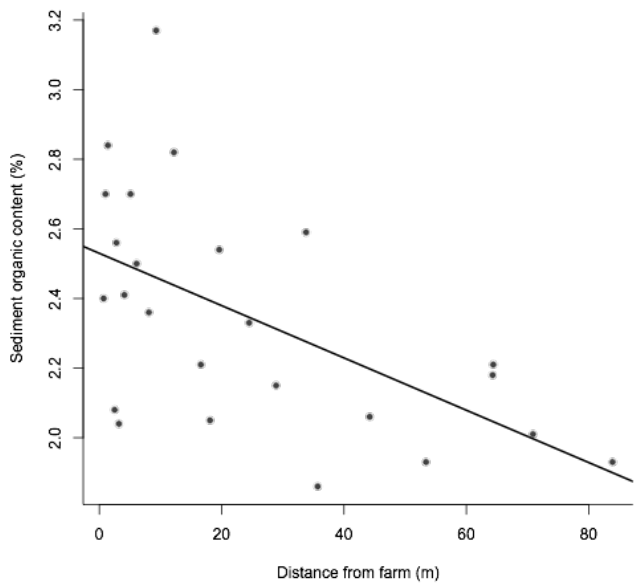
3 - Possible increased sediment organic content, reduced standing biomass near farm

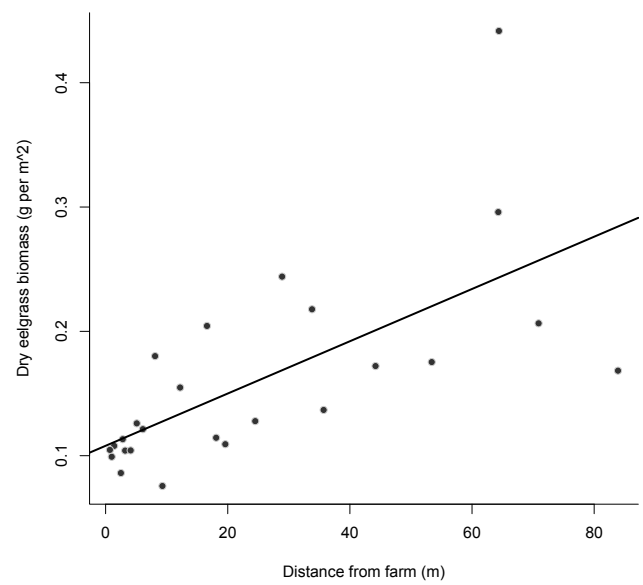
4/9/08
6/30/08
7/29/08
11/12/08
4/26/09
7/18/09
11/4/09
4/30/10

Sediment organic content



Rsquared = 0.319
F1,23 = 10.792 p = 0.003

Standing biomass



Rsquared = 0.443
F1,23 = 18.27 p = 0

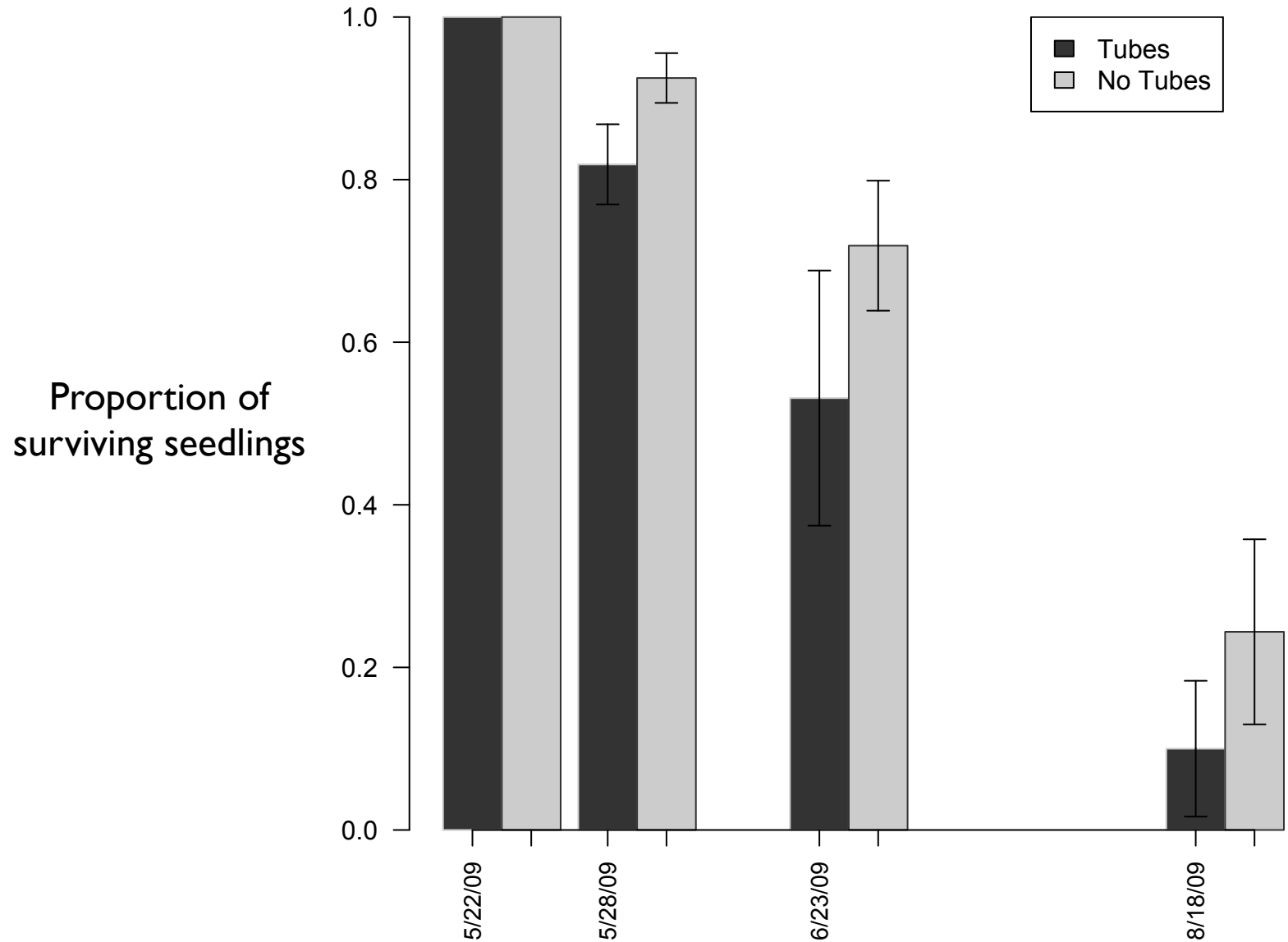
How do predator-exclosure tubes affect eelgrass?

How do predator-exclosure tubes affect eelgrass?

1 - Reduced eelgrass seedling success

How do predator-exclosure tubes affect eelgrass?

1 - Reduced eelgrass seedling success



How do predator-exclosure tubes affect eelgrass?

1 - Reduced eelgrass seedling success

2 - No effect on sediment organic content

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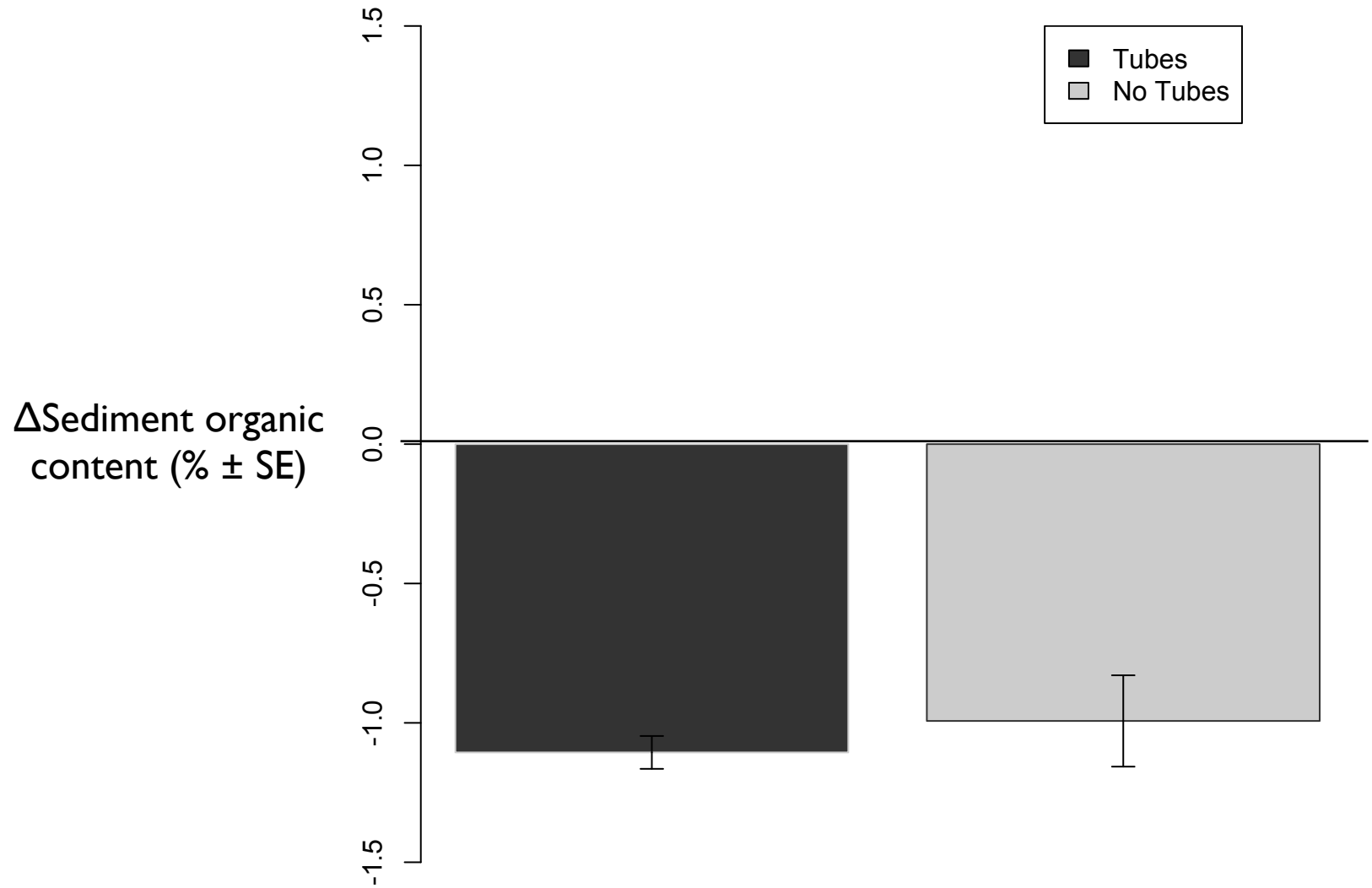

How do predator-exclosure tubes affect eelgrass?

1 - Reduced eelgrass seedling success

2 - No effect on sediment organic content

3 - No effect on sediment stability

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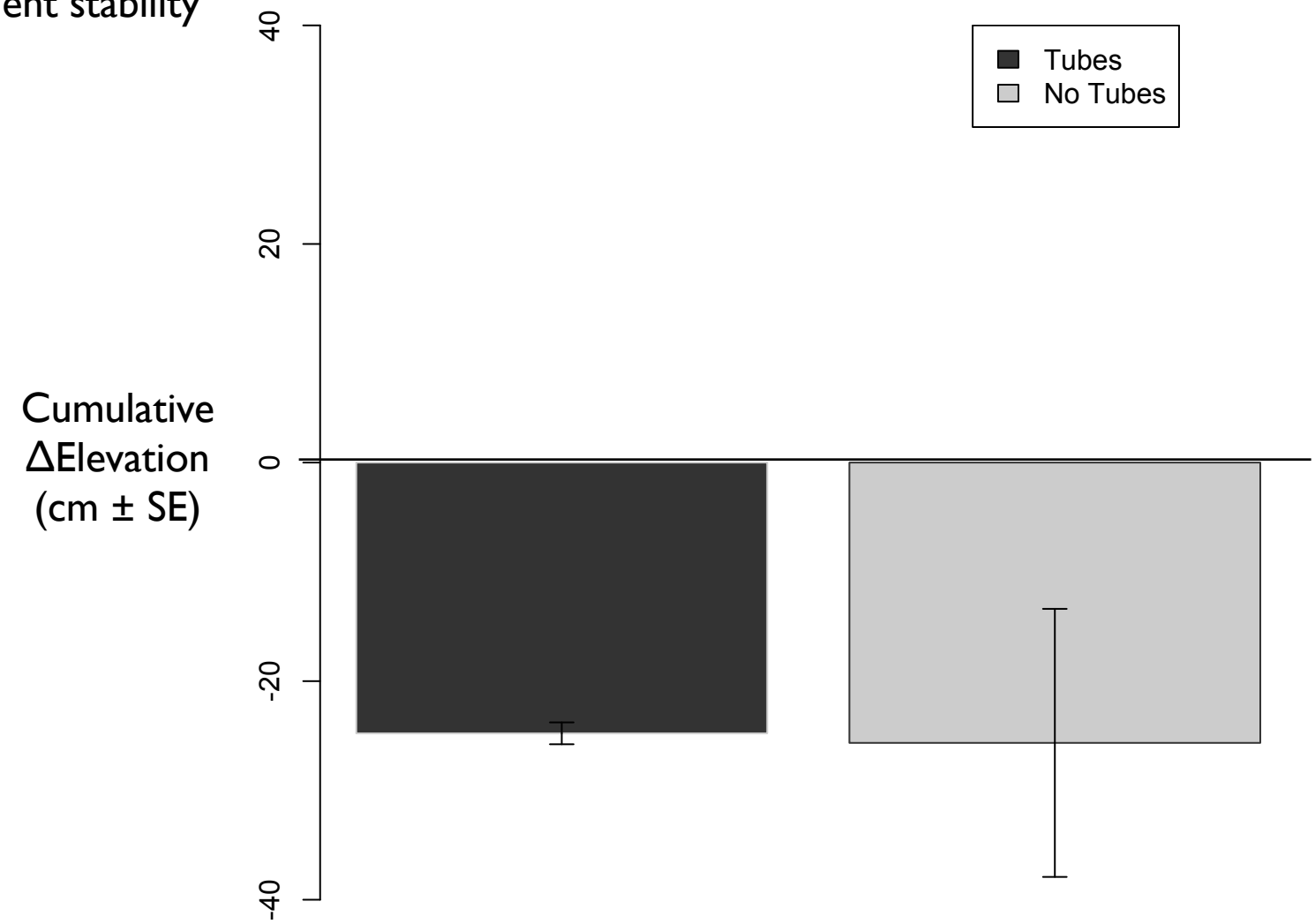

Geoduck farming effects to date

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<u>Within farm</u>

- Loss of eelgrass
  - Reduced size and reproductive activity prior to loss
- Reduced sediment organic content
- Short-term loss of elevation

Geoduck farming effects to date

Within farm

- Loss of eelgrass
  - Reduced size and reproductive activity prior to loss
- Reduced sediment organic content
- Short-term loss of elevation

Spillover

- Reduced eelgrass size
- Increased eelgrass density
- Possible increase in sediment organic content and decrease in standing biomass

Support

Sea Grant
Washington

Field Assistance

Julianna Chen
Katie Cochrane
Audrey Djunaedi
Giorgio Guerra
Caleb Hecker
Kelsey Hinton
Isaac Horwith
Henry Howes
Sarah Jubinski
Ailene Kane
Satprit Kaur
Max Maliska
Claire Miccio
Gia Nguyen
Julie Nicol
Dr. Fernanda Oyarzun
Emily Palm
Adam Parast
Sascha Troiano
Chaochung Tsai
Chaowei Tsai
Dr. Ursula Valdez
Brady Walkinshaw
Kyle Wataya
Inness Wragg
Sylvia Yang
Dr. Jae-Won Yoo

Guidance

Dr. Janneke Hille Ris Lambers
Dr. Jennifer Ruesink