

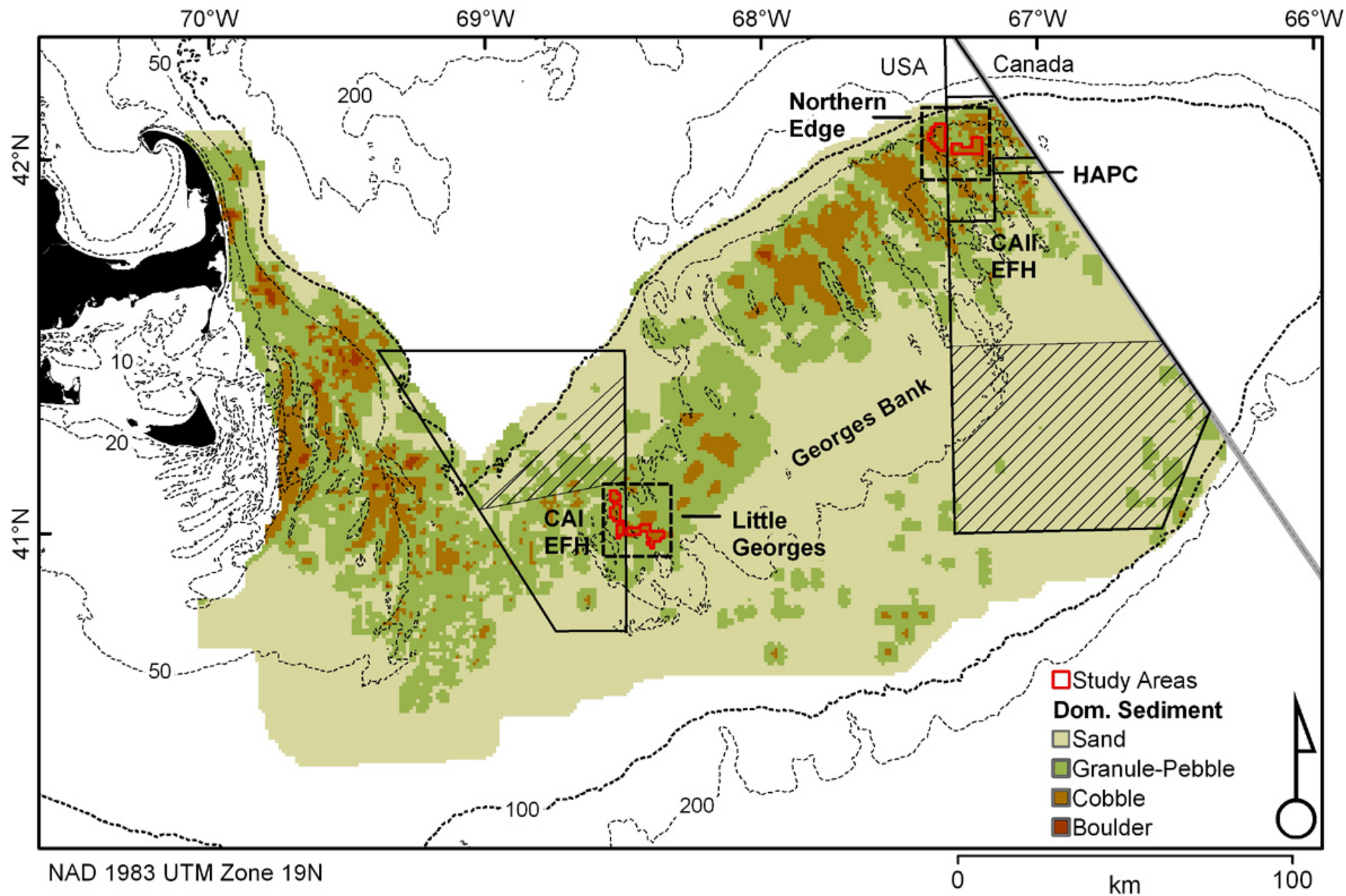
# Effects of mobile fishing gear on geological and biological structure: A Georges Bank closed versus open area comparison

## Proposed Work:

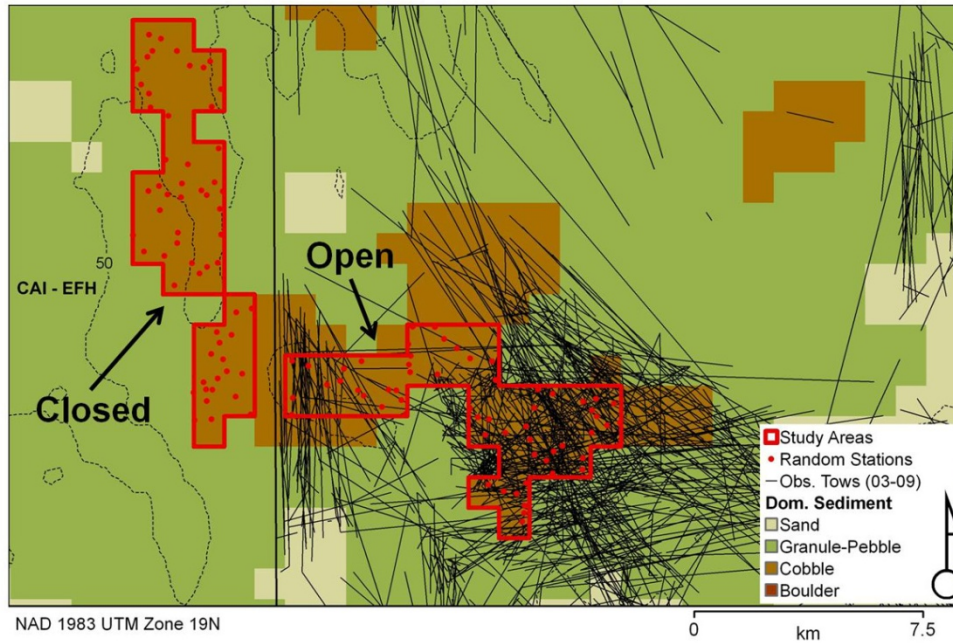
We will test the null hypothesis of no difference in the open versus closed sites by comparing the geological and biological structures in gravel outcrops on the Northern Edge and on Little Georges which are bisected by Essential Fish Habitat (EFH) Closed Area boundaries.

Fishing with trawls and dredges has been prohibited in the EFH closed areas since 1994. Adjacent fished and closed study sites (30 km<sup>2</sup> each) were chosen based on NOAA observed otter trawl and scallop dredge tows from 2003 - 2009 and the EFH Closed Area boundaries respectively.

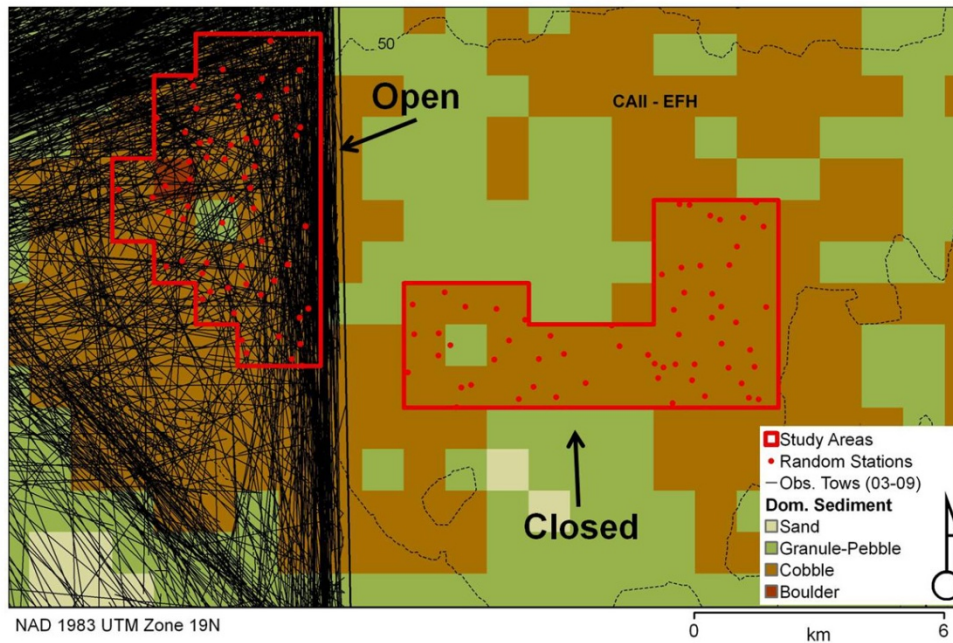
Data collected on a 6-day video survey during the summer of 2011 will be used to assess and compare the geological and biological structures in these sites.

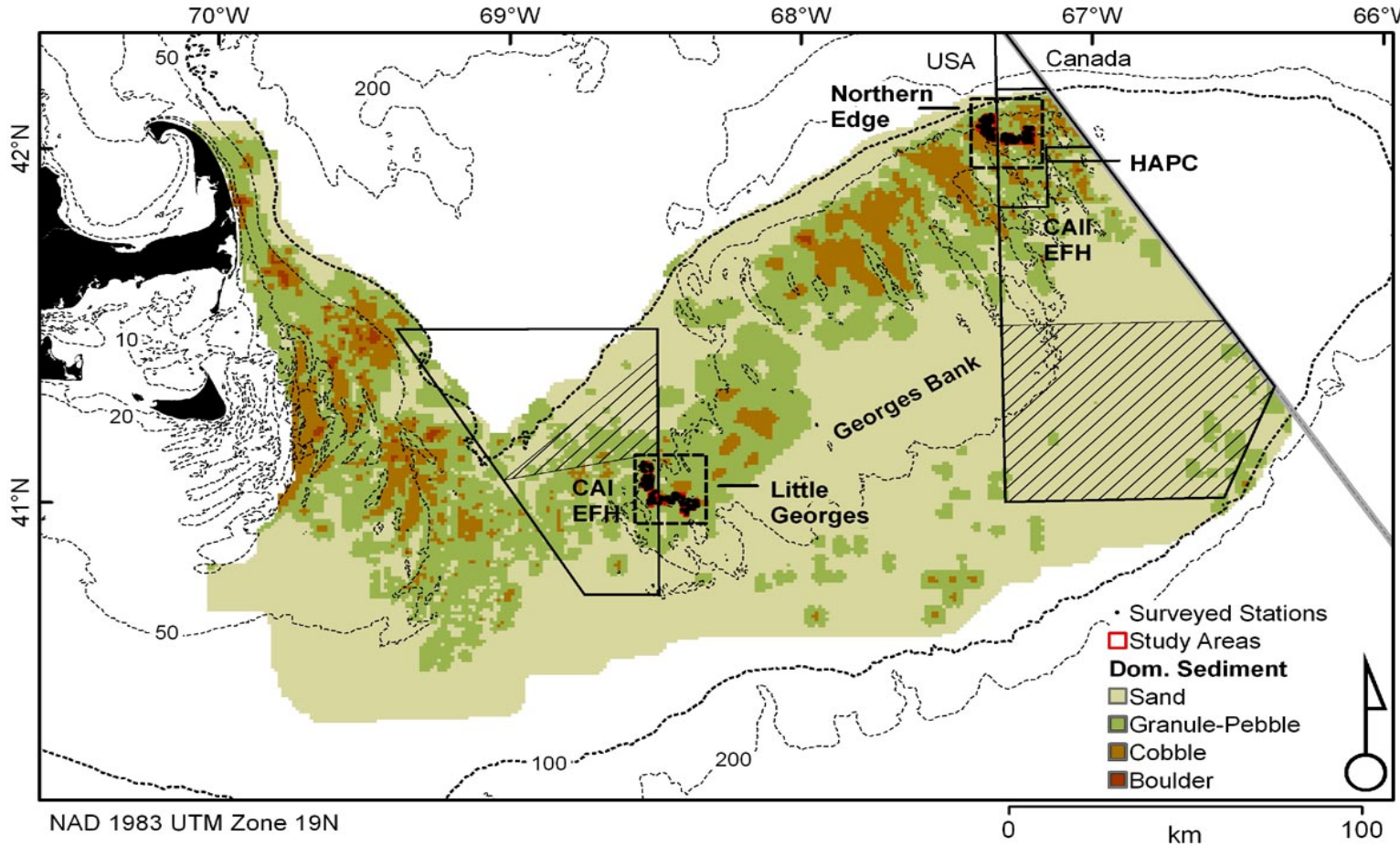


# Little Georges

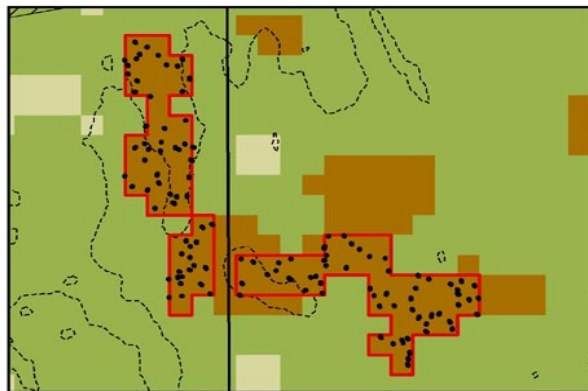


# Northern Edge

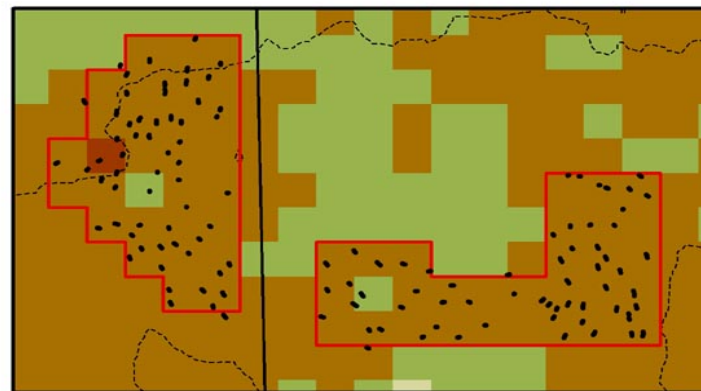




Little Georges Study Area

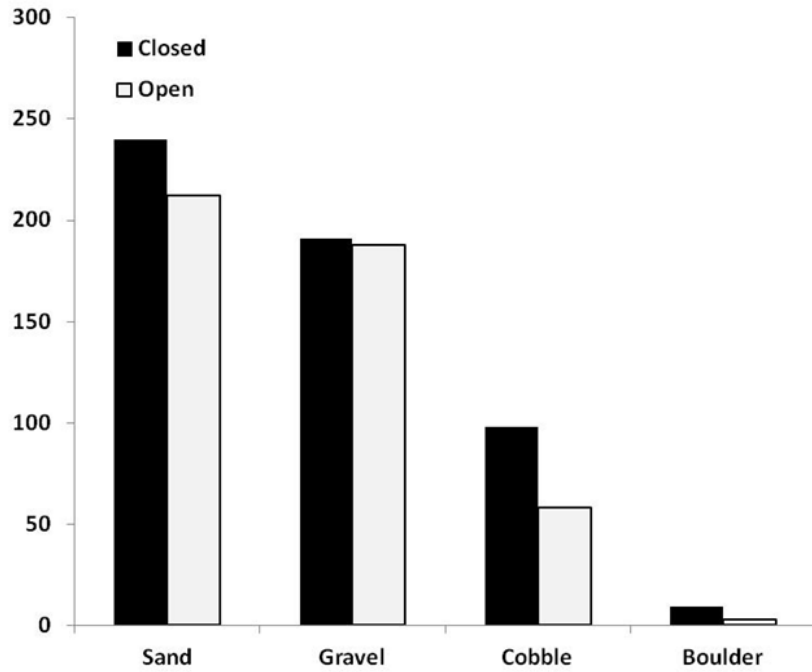


Northern Edge Study Area



### Little Georges

$\chi^2 = 4.21$ ,  $df = 3$ ,  $p = 0.239$



### Northern Edge

$\chi^2 = 1.26$ ,  $df = 3$ ,  $p = 0.739$

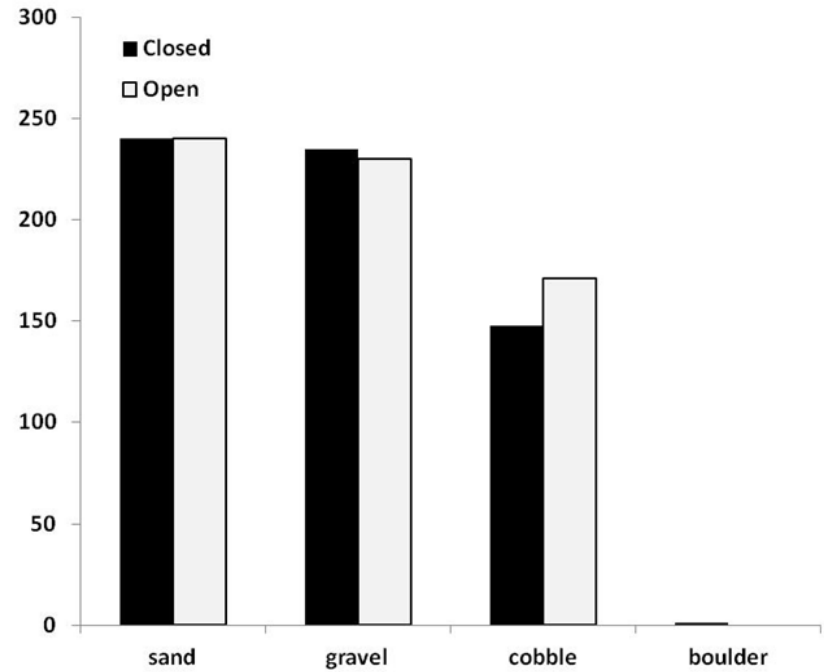
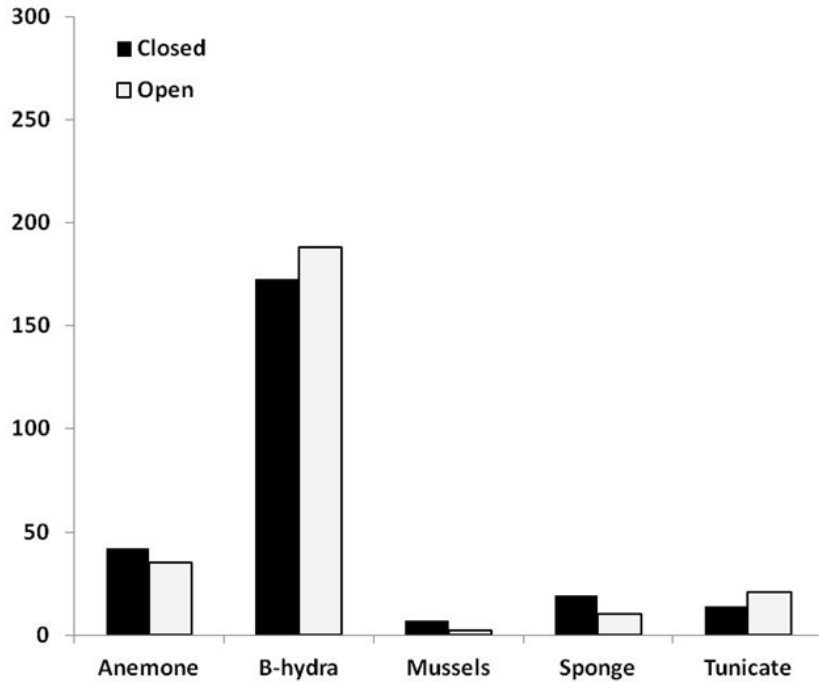


Figure 1. Number of stations with Sand, Gravel, Cobble and/or Boulder in Closed and Open areas in the Little Georges and Northern Edge Study Areas.

## Little Georges

$\chi^2 = 2.02$ ,  $df = 4$ ,  $p = 0.732$



## Northern Edge

$\chi^2 = 64.15$ ,  $df = 3$ ,  $p < 0.001$

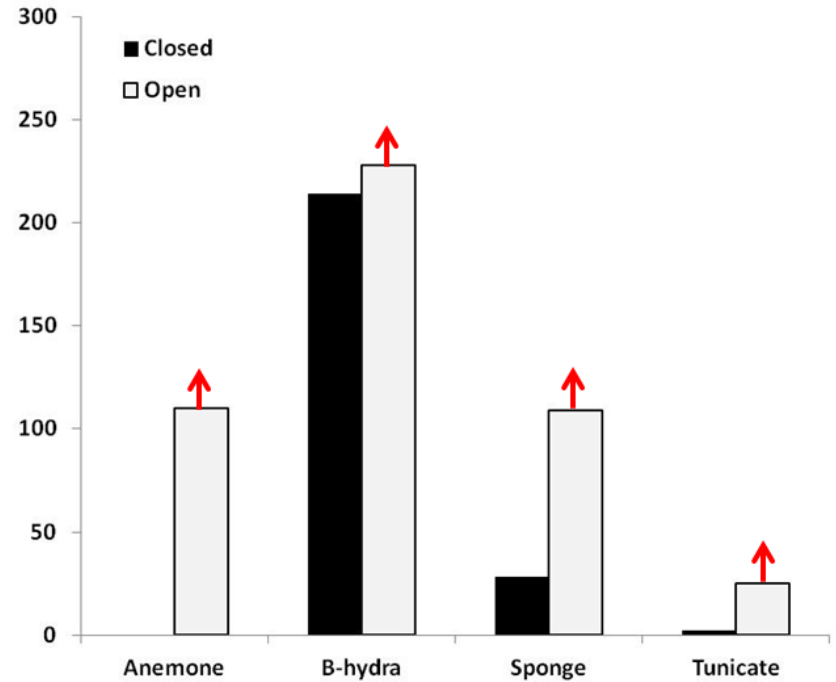
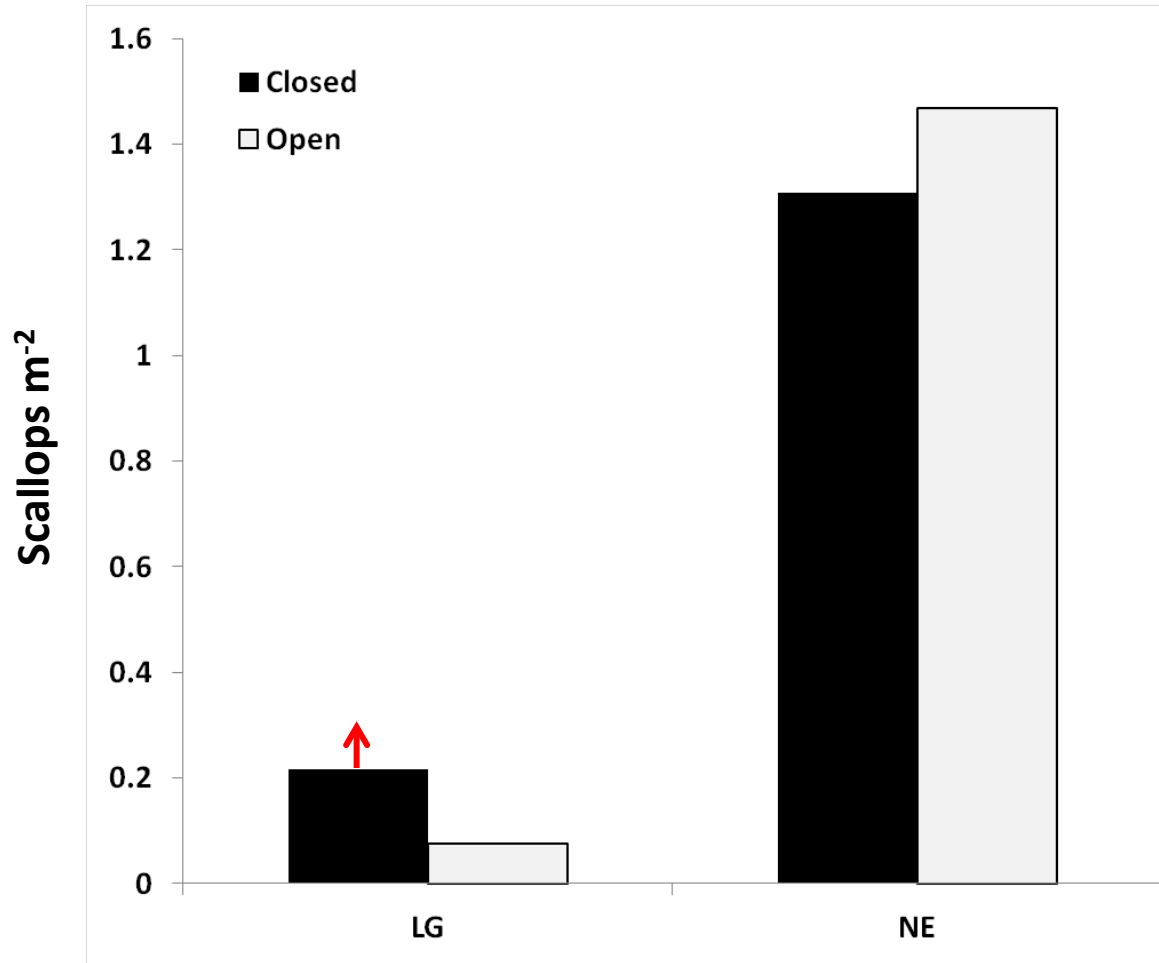


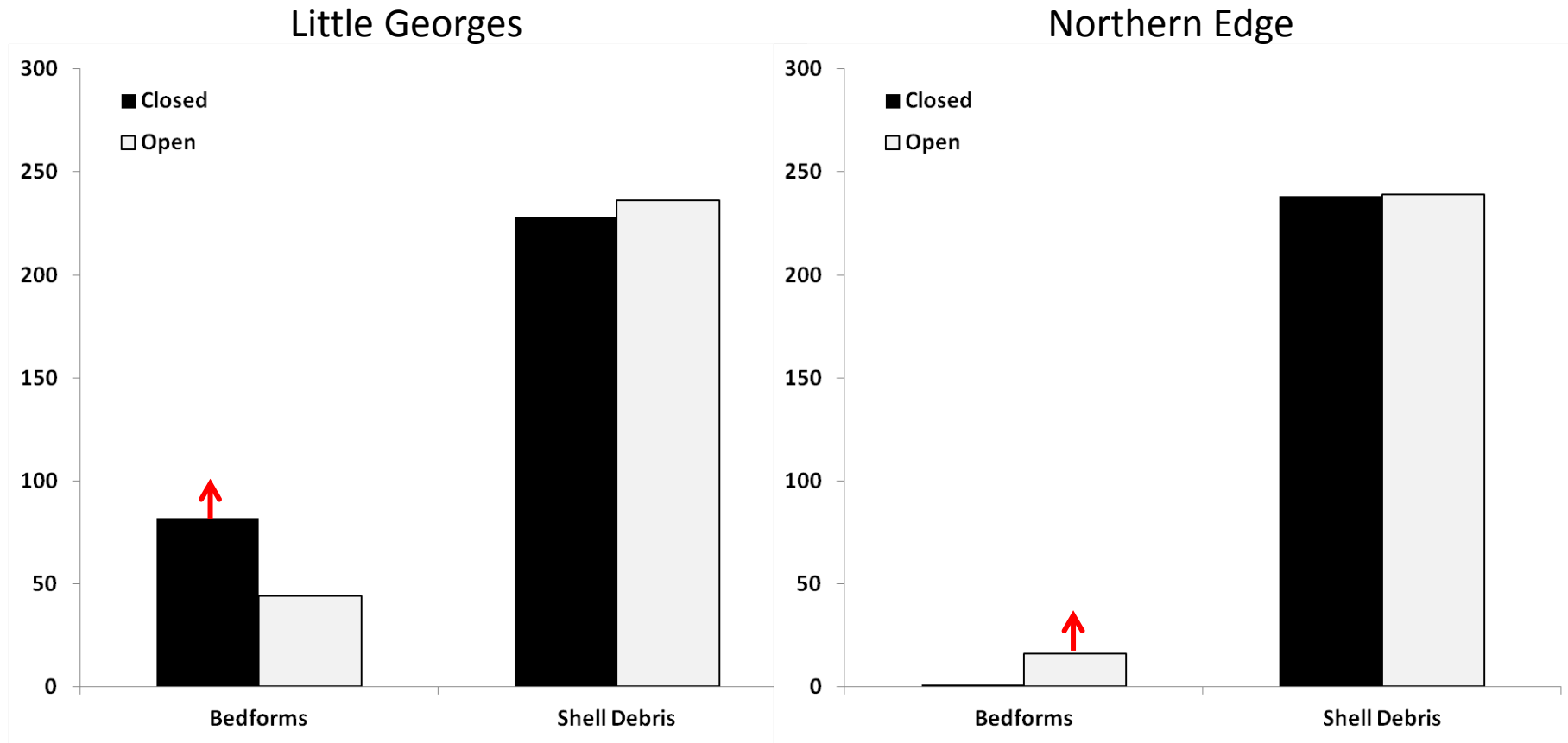
Fig 2. Graphs showing the number of stations with structure-forming biota observed in the Open and Closed areas in the LG and NE study areas.

# Georges Bank Study: Prelim Results



***Scallop density higher in LG Closed. No difference in NE.***

# Georges Bank Study: Prelim Results



***Higher prevalence of Bedforms in Closed at LG and in Open at NE  
No difference in Shell debris***



# Georges Bank Study: Discussion

**SASI Model → ↓30% geological- 40% biological structure**  
**Trawl and Dredge Intensity → High Impact**

**Why didn't we see the expected impacts?**

- ? Susceptibility (geological and biological structures, gear components)
- ? Recovery (too fast or slow)
- ? Natural Disturbance

**Future Work:**

Percent coverage

Fragmentation

Vertical height.

Proportion of attached epifauna using each substrate type.



# Acknowledgements

## **SASI Model**

Habitat PDT (C. Demarest, J. Grabowski, S. Eayrs, M. Bachman and D. Stevenson)

## **Field work and video/ image analysis**

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**The USA commercial sea scallop industry provided in-kind support included the vessels, food, fuel and expertise.**

An underwater photograph showing a diverse and colorful coral reef ecosystem. The seabed is covered with various types of coral, including branching and table corals in shades of brown, orange, yellow, and purple. Several sea urchins are visible, some with their spines extended. The water is clear, and the overall scene is vibrant and healthy.

**Thank you!**