



Restoration of oyster reefs in tidal creeks: Does landscape matter?

Marc Hanke, Martin Posey, Troy Alphin
University of North Carolina Wilmington,
Wilmington, NC 28403

Importance of Understanding Tidal Creek Landscape

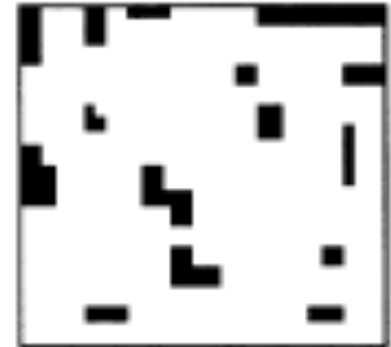
- Role of oysters in tidal creeks
- Decline of oyster populations
 - habitat loss



1



2



3



time

Research Objectives

- Overall objective is to understand importance of landscape for oyster reef restoration within tidal creeks
 - Oysters
 - Resident macrofauna
 - Nekton
- Specific objectives
 - Edge versus interior
 - Reef size
 - Patch versus fringing reefs
 - Development of created oyster reefs

Large Scale



Fringing

4 Small

4 Medium

3 Large

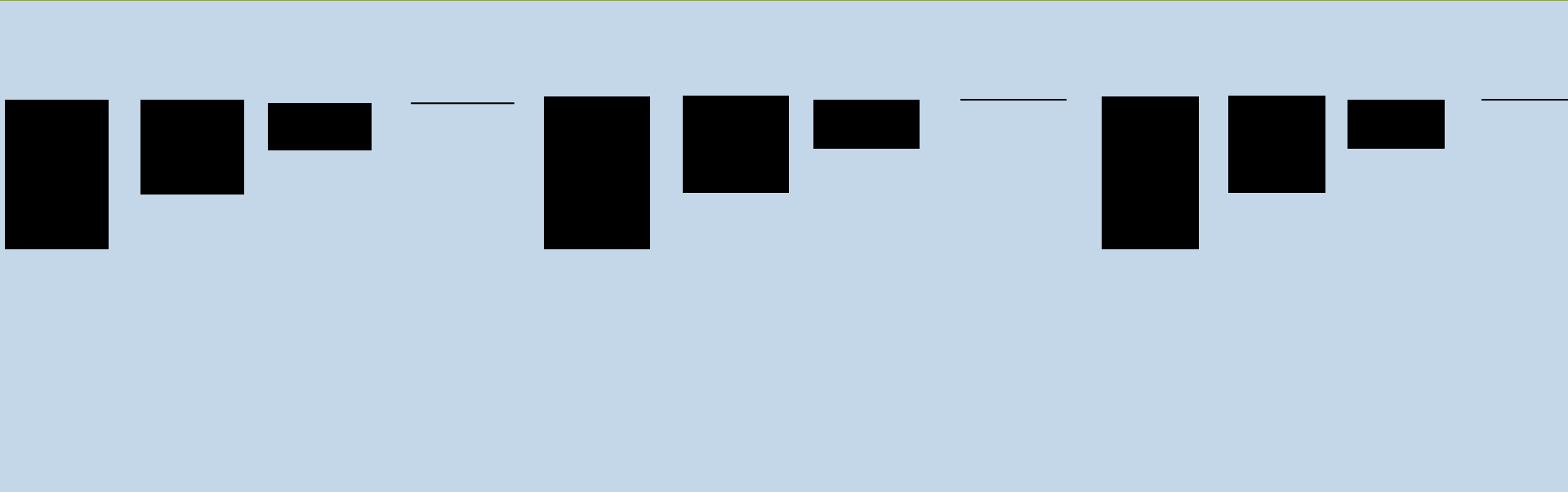
Patch

3 Small

5 Medium

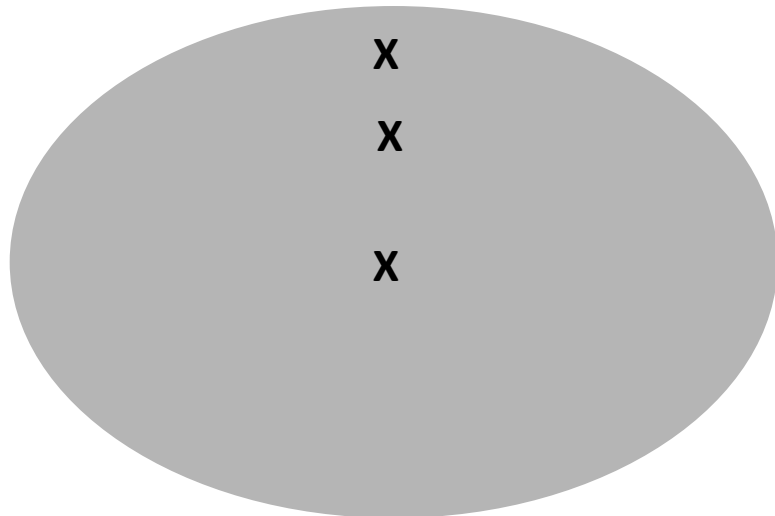
3 Large

Large Scale Experimental Study



Methodology

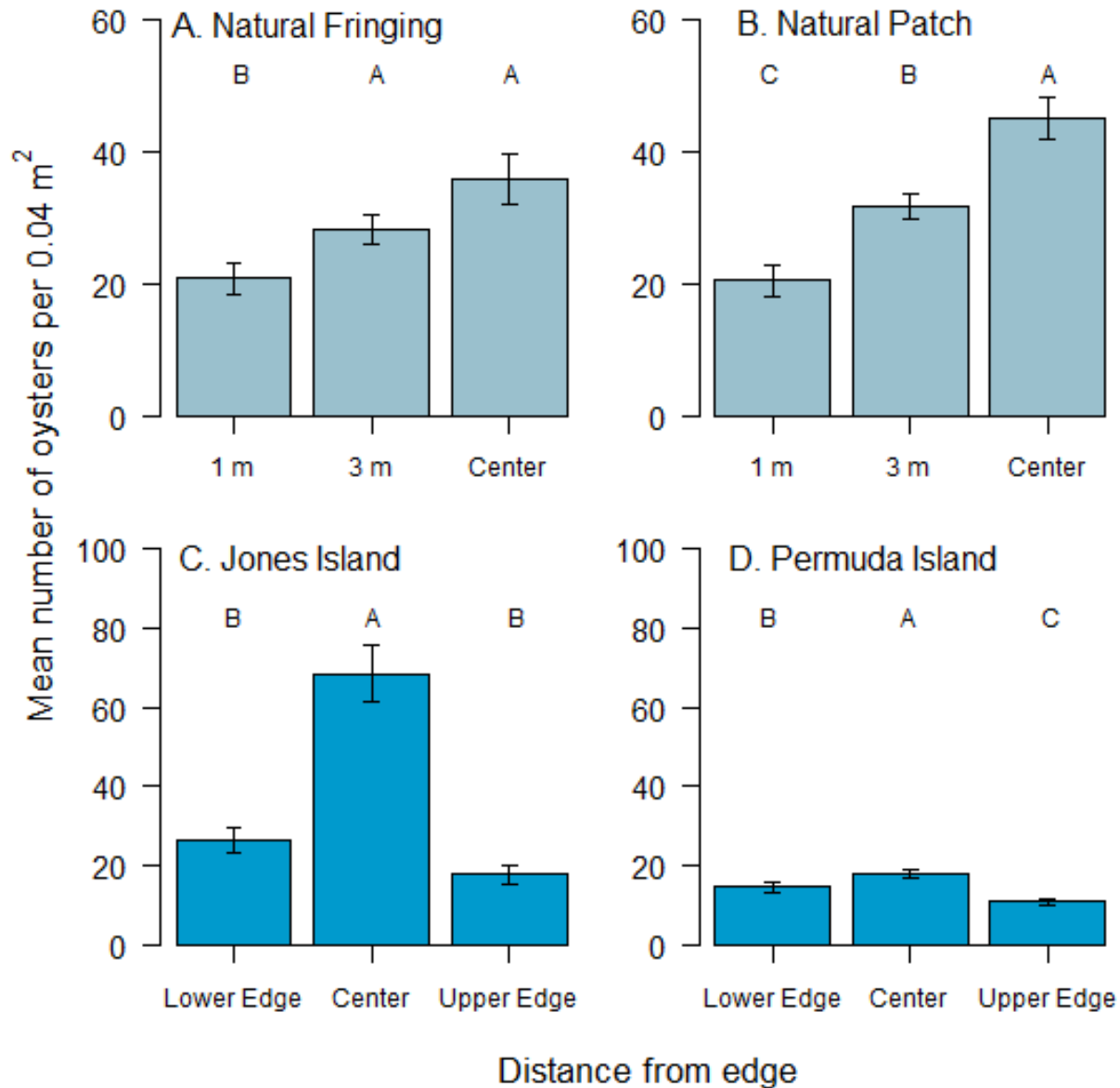
- Oyster Reef Characteristics
- Oyster Condition



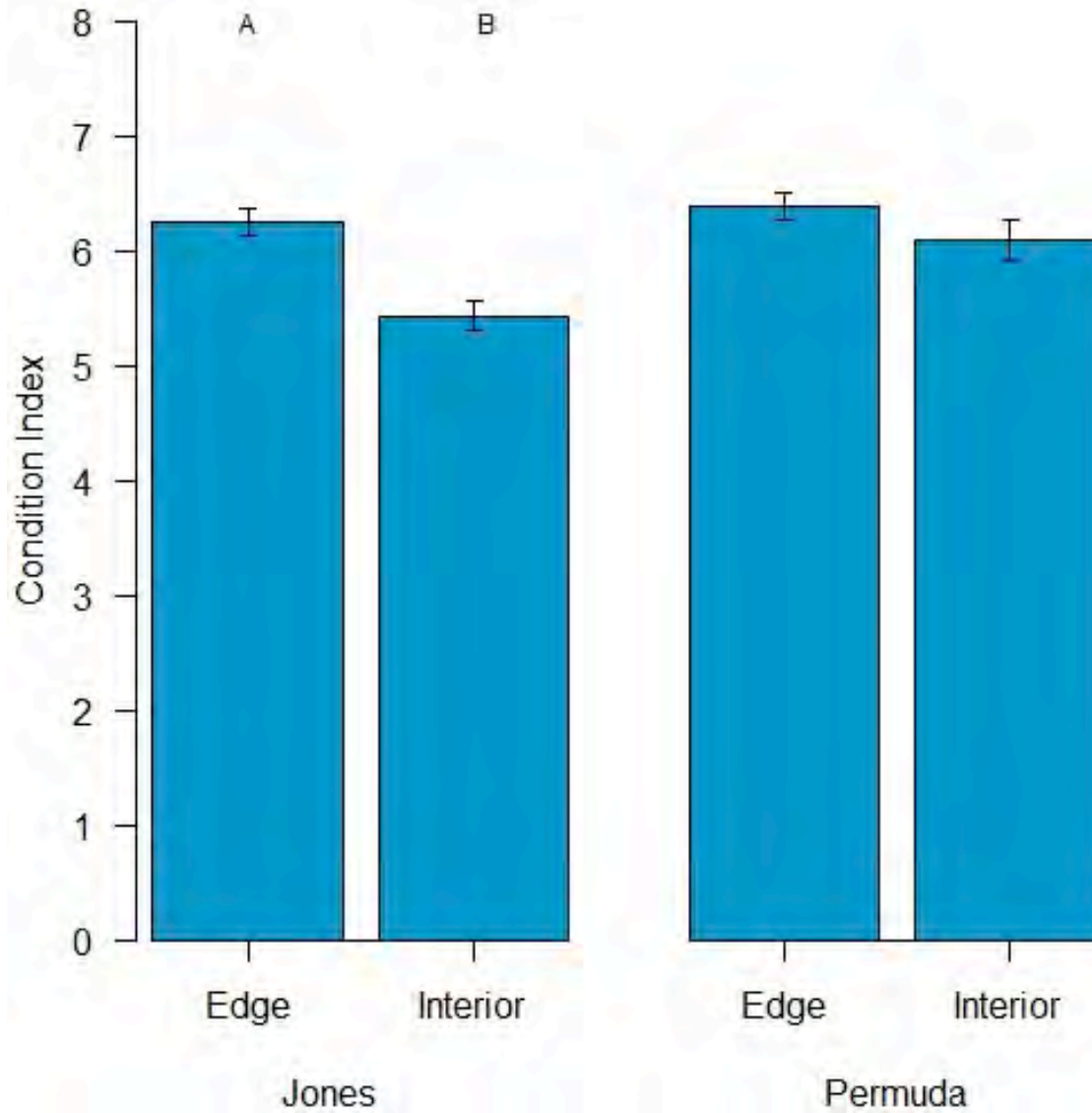
Preliminary Results

- Edge vs. Interior
 - Density
 - Varied by fringing and patch reefs
 - Greater densities at interior locations
 - Condition
 - Created reefs trended towards increase along edge

Effect of Edge vs. Interior on Oyster Density



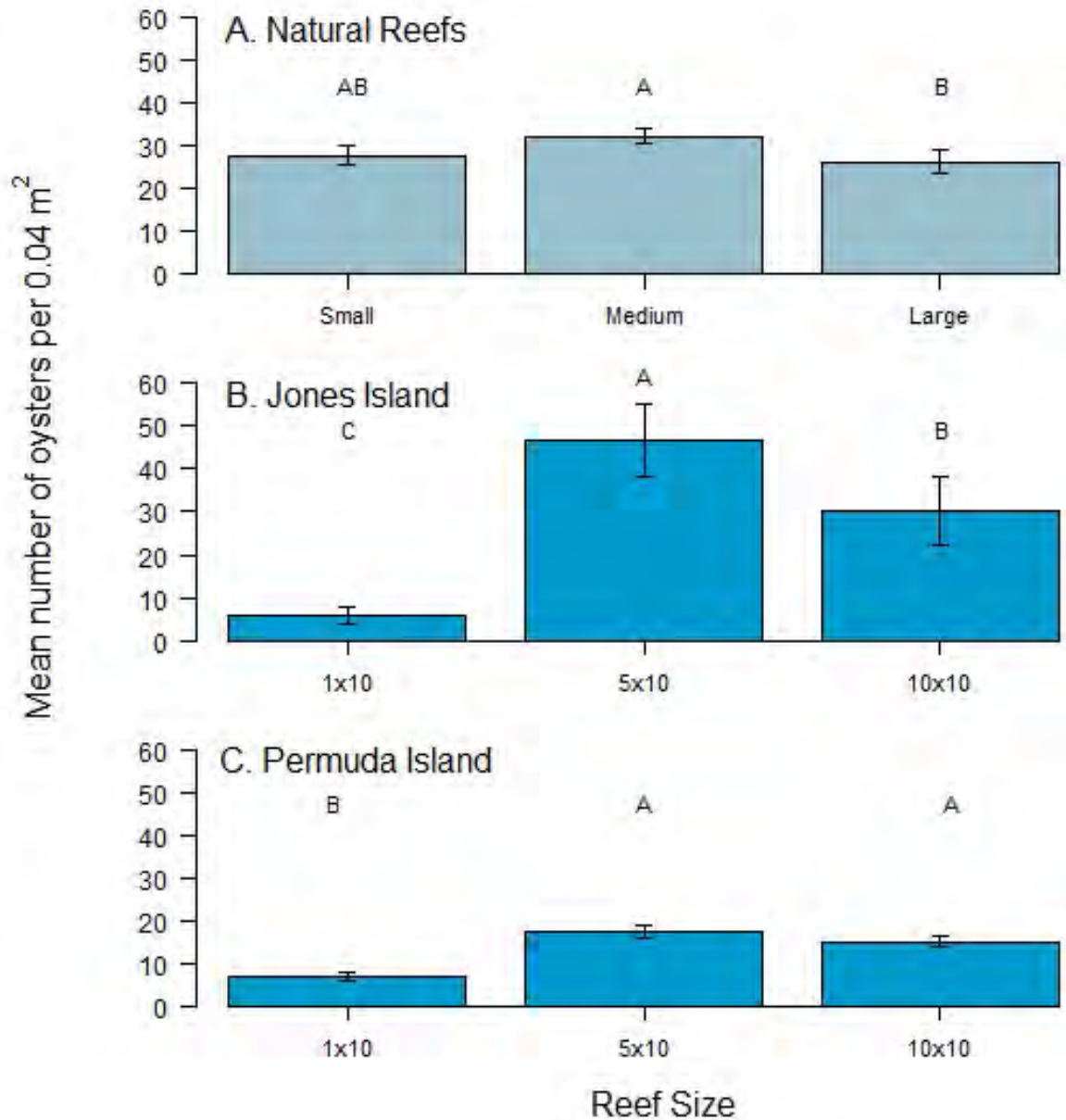
Effects of Edge vs. Interior Condition



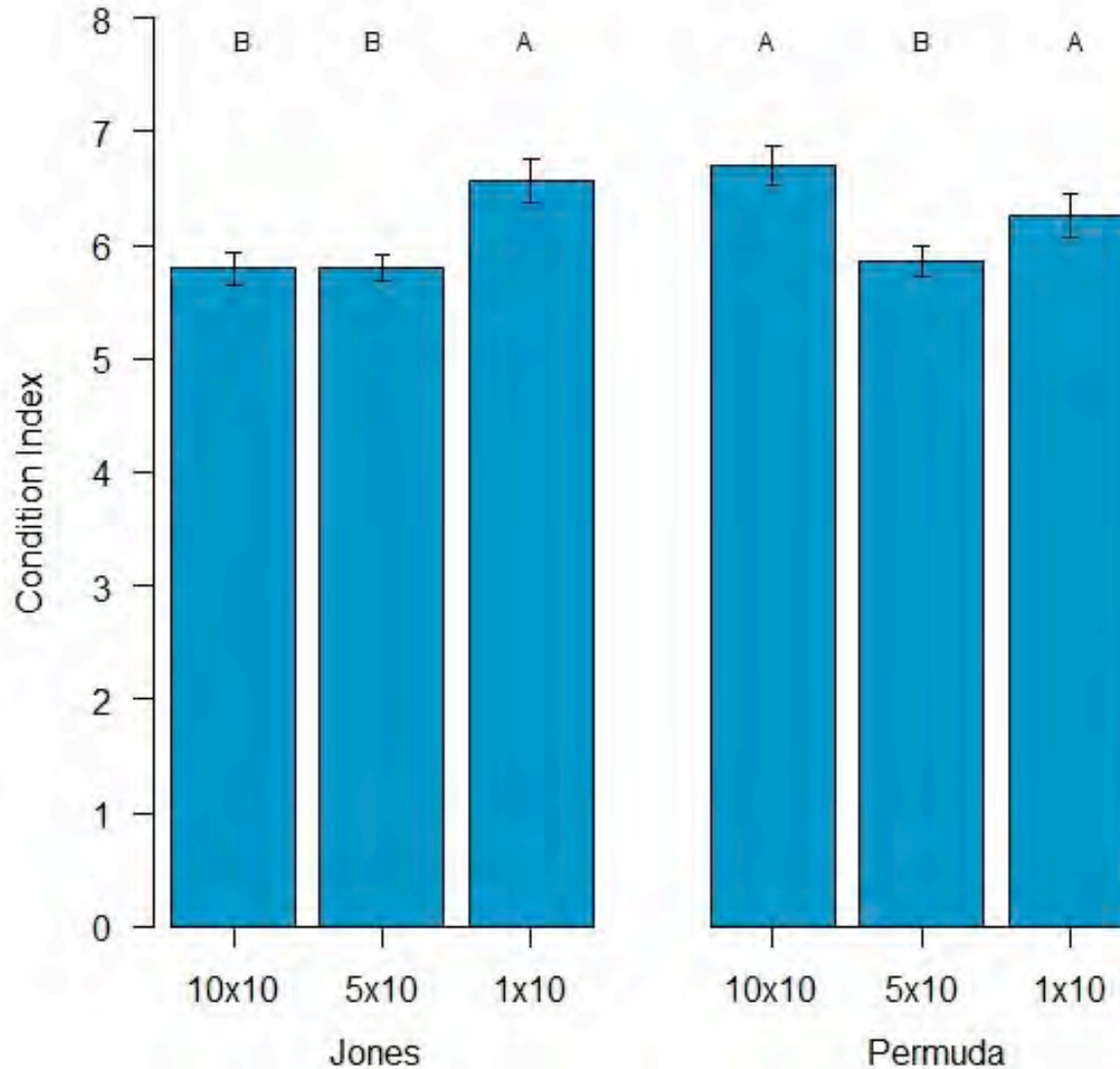
Preliminary Results

- Reef Size
 - Density
 - Greater densities on intermediate reef size
 - Condition
 - Trend towards increased condition with decreasing size

Effect of Reef Size on Oyster Density



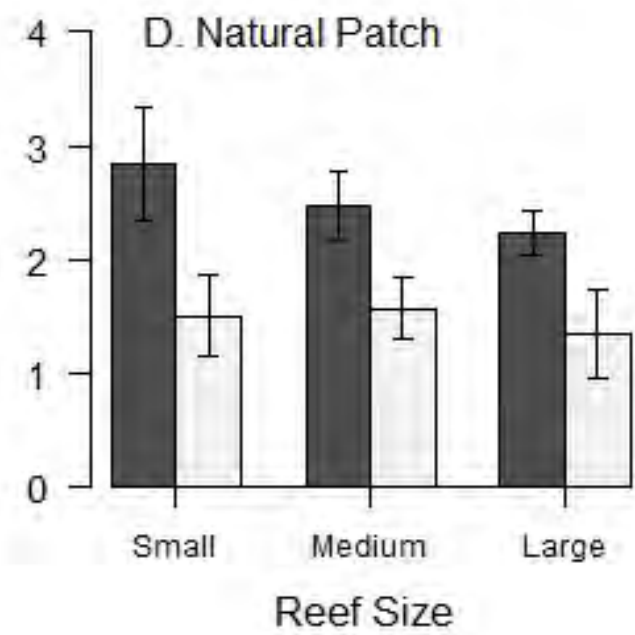
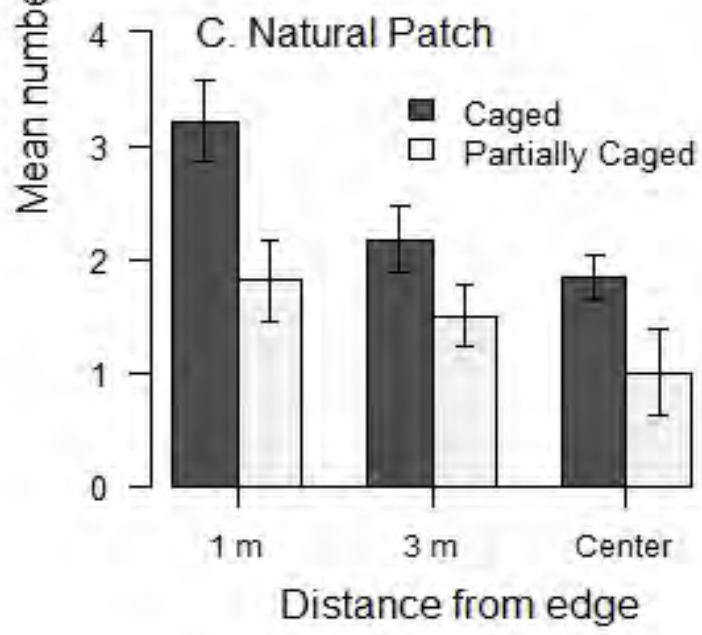
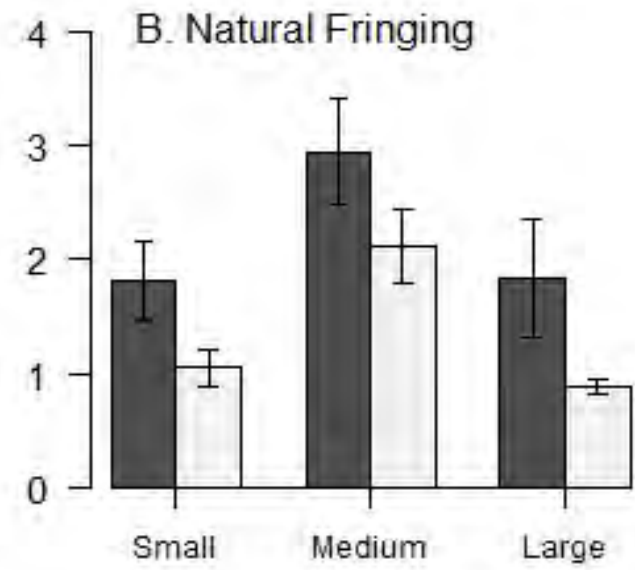
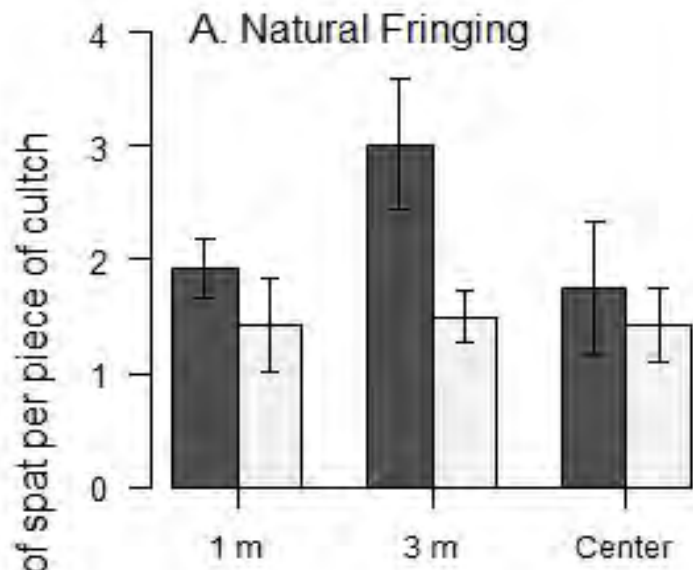
Effect of Reef Size Condition

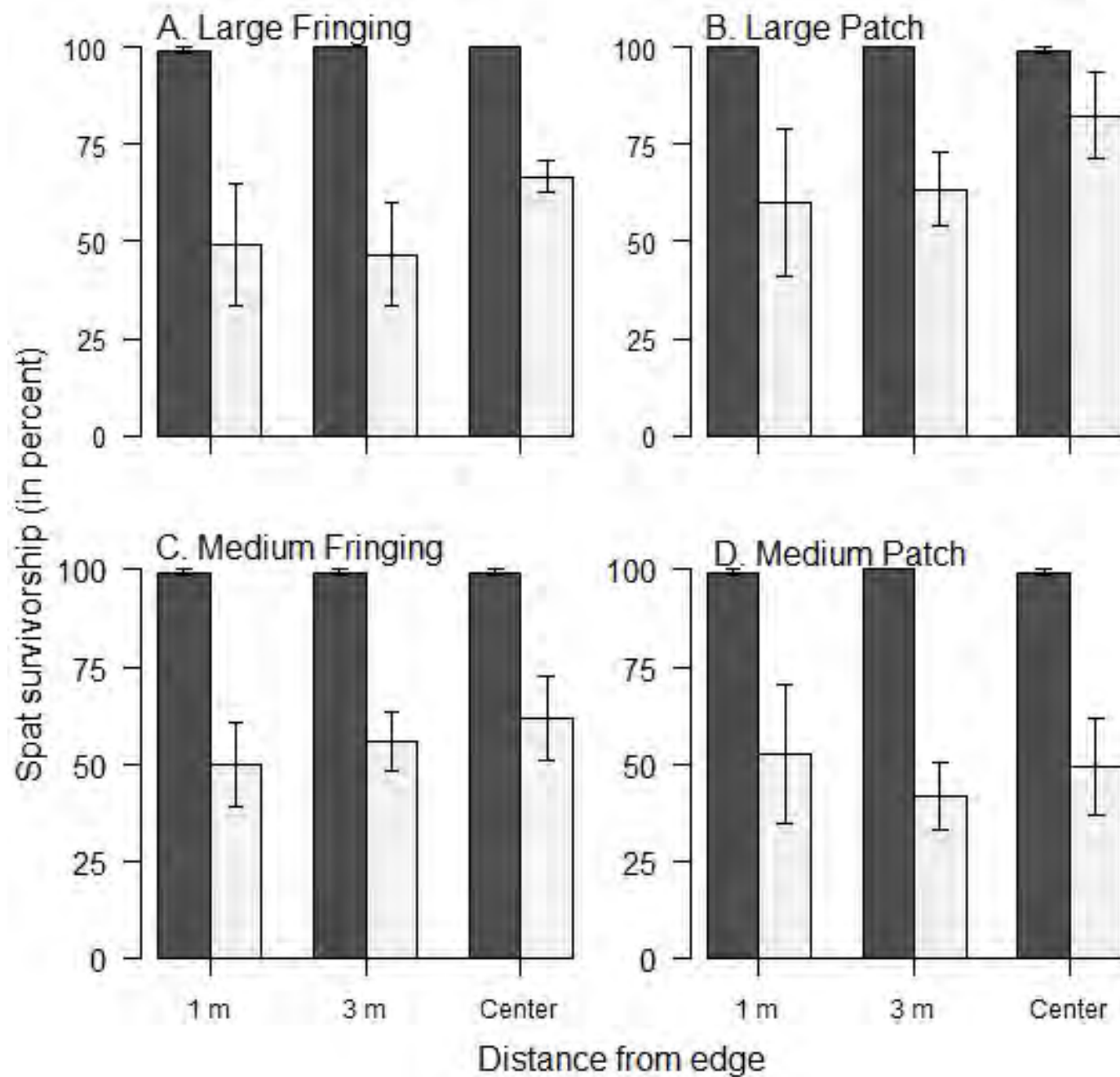


Deterministic Factors for Landscape Patterns

- Recruitment
 - 2 replicate caged and open top trays
 - Deployed May
 - Retrieved October/November
- Predation
 - 2 replicate caged and open top trays
 - Deployed low tide
 - Retrieved high tide



























































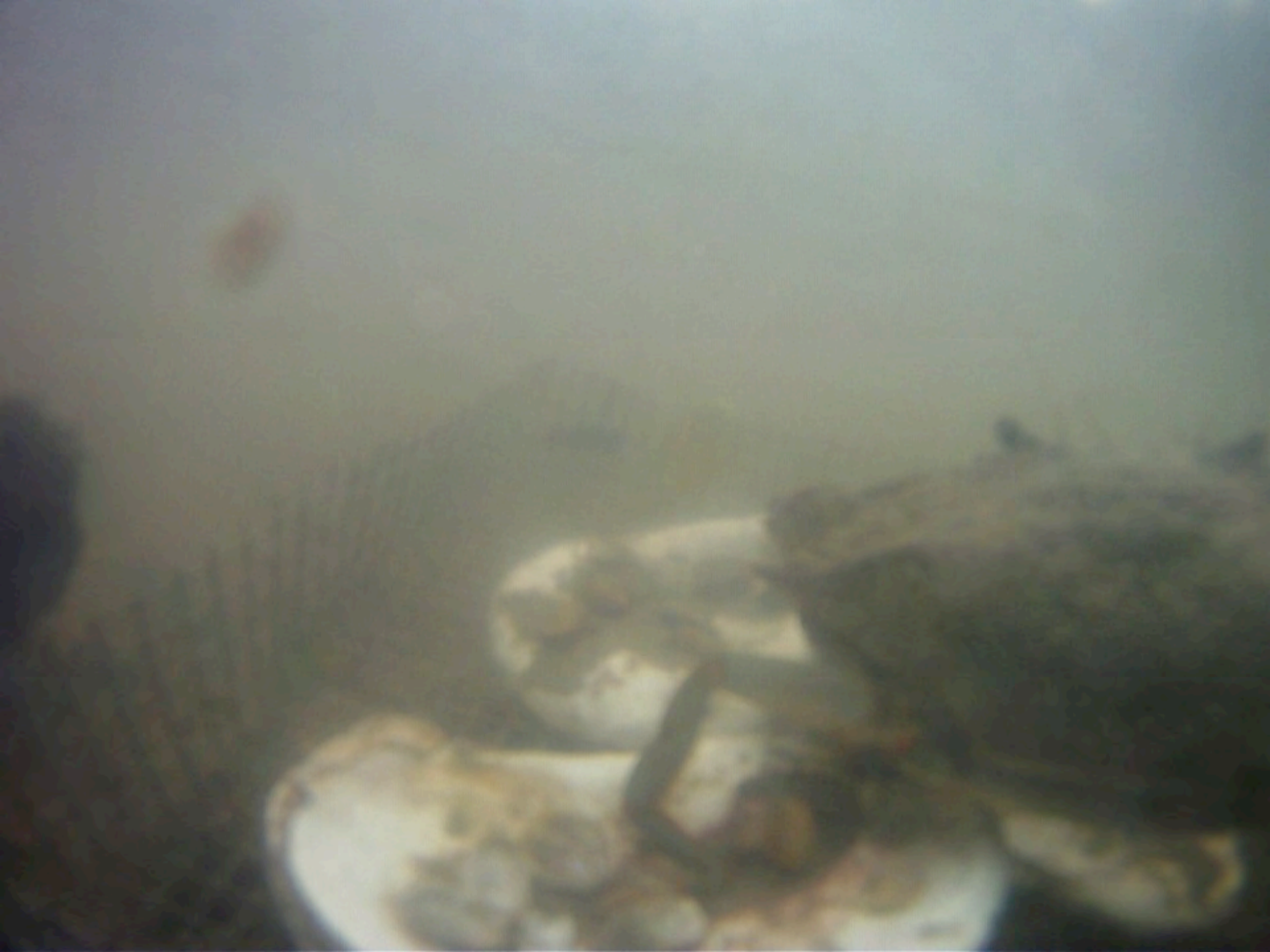












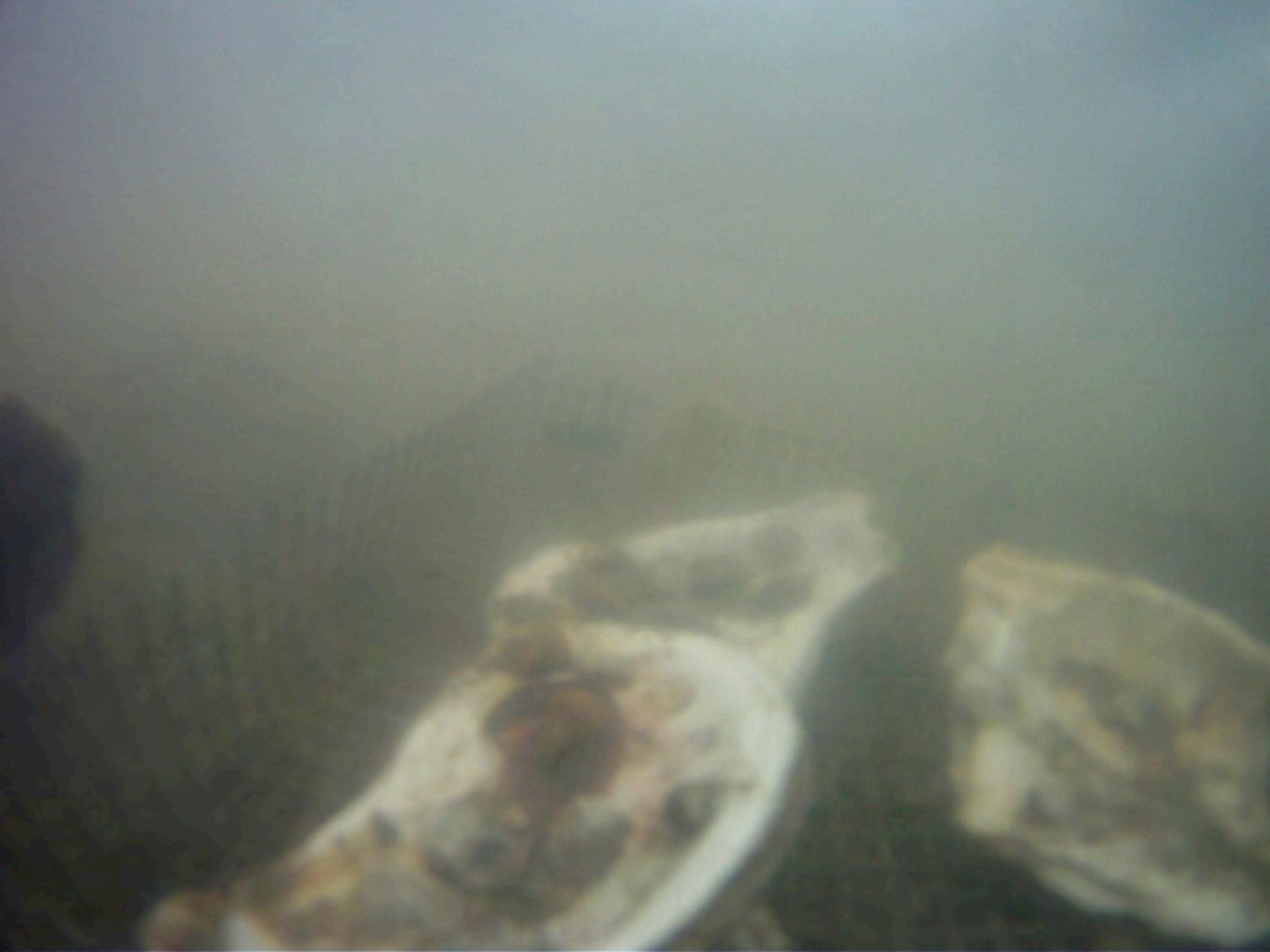




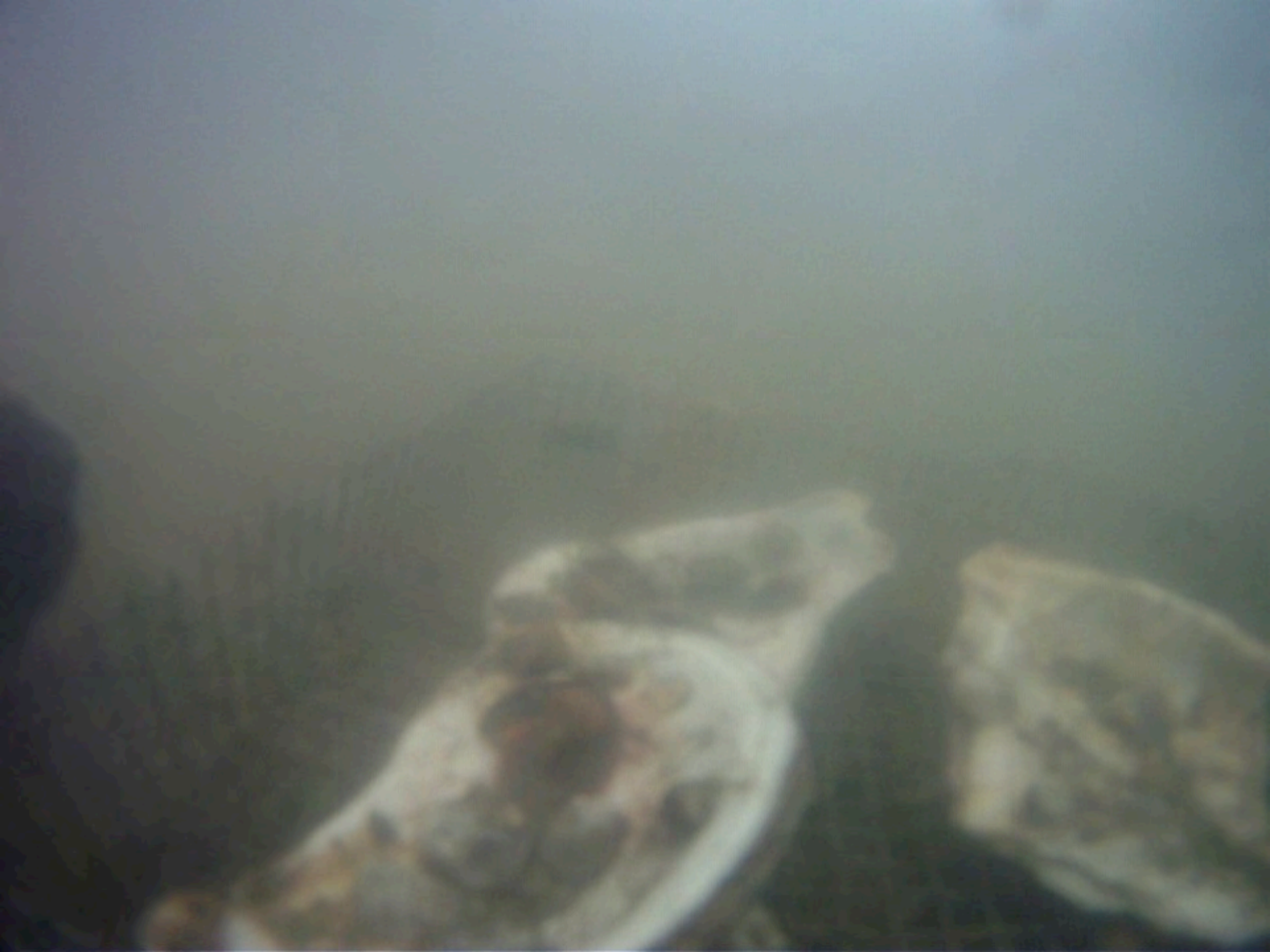


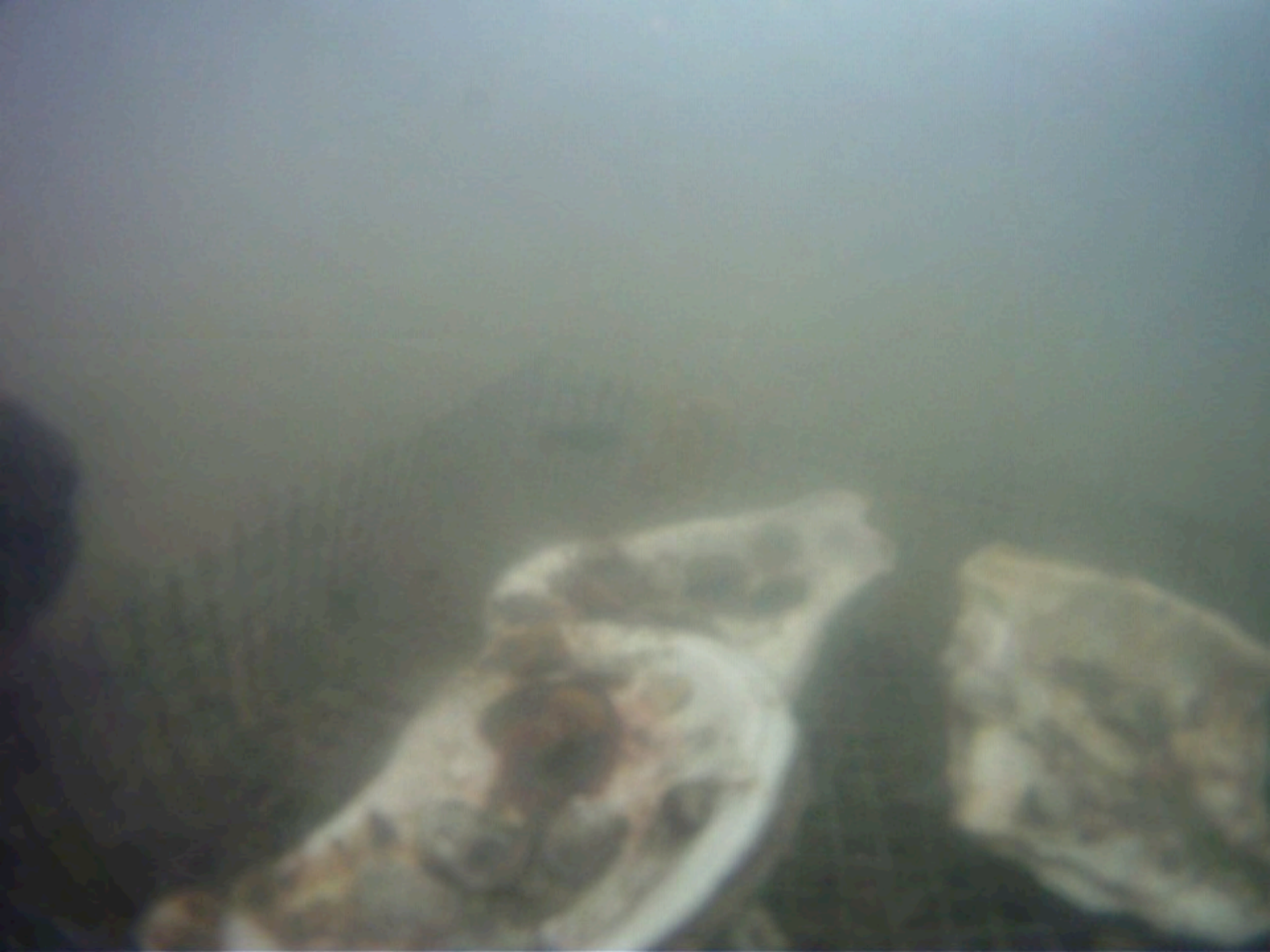














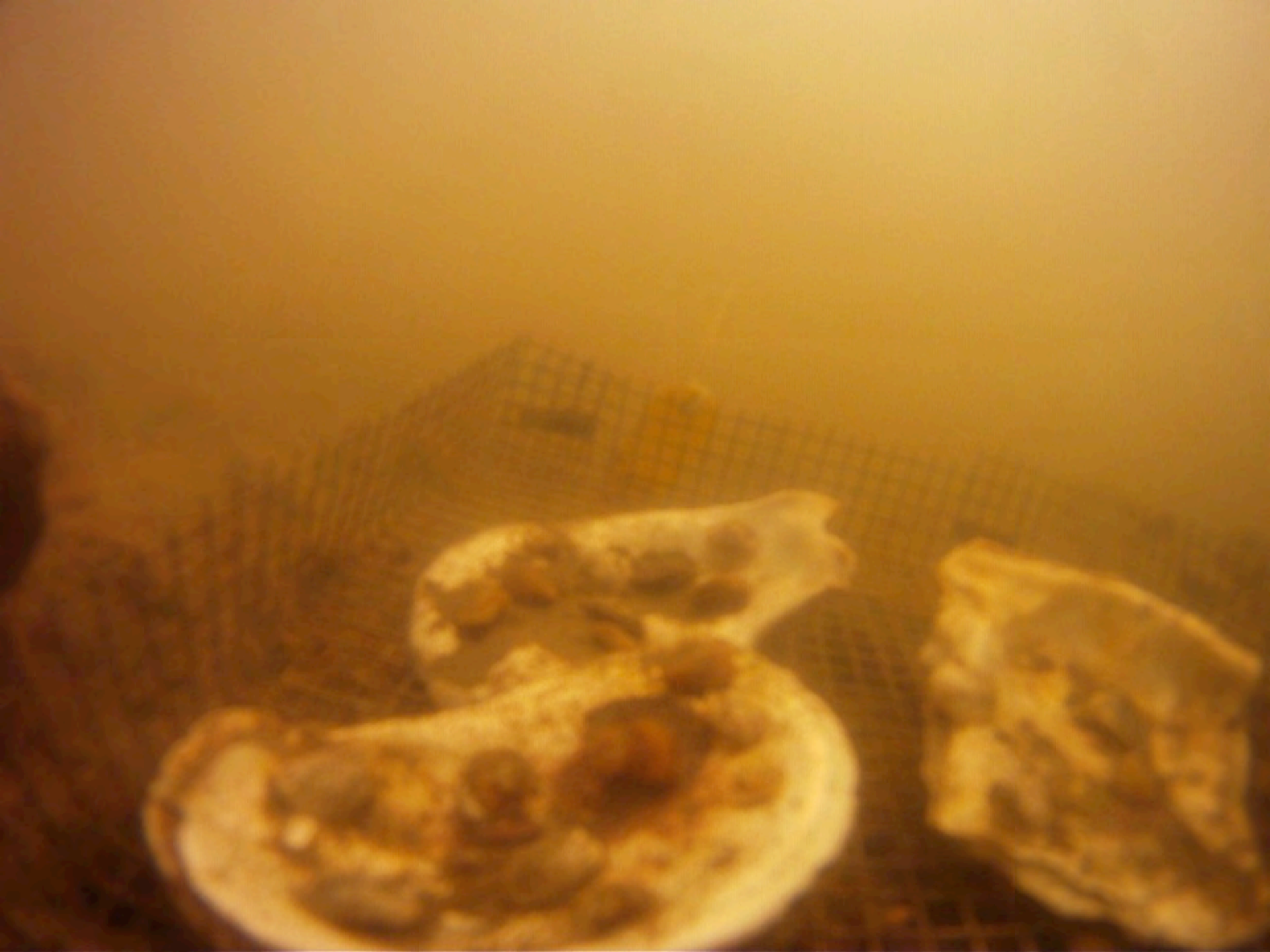






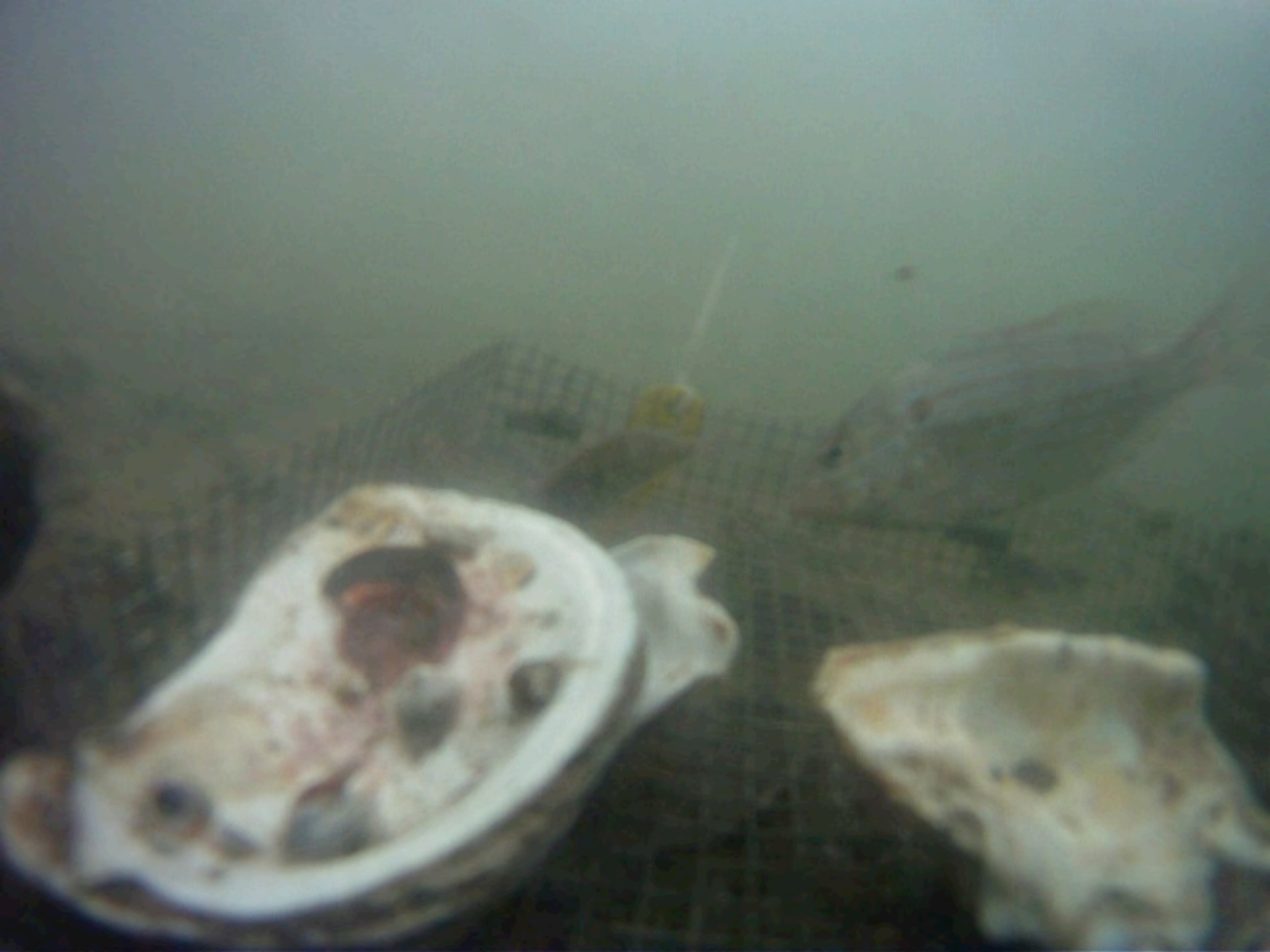












Conclusion of Results

- Initial results indicate importance of landscape for intertidal oyster reefs
- Implications for intertidal oyster reef function, management, and restoration
- Implications for tidal creek ecosystems



Acknowledgements



- Field assistance and processing
 - Benthic Lab
 - Volunteers

- Funding Sources



Mitch Baker

