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PATUXENT ENVIRONMENTAL AND AQUATIC RESEARCH LABORATORY

A Pilot Study of Softshell Clam Culture in Subtidal Maryland Waters

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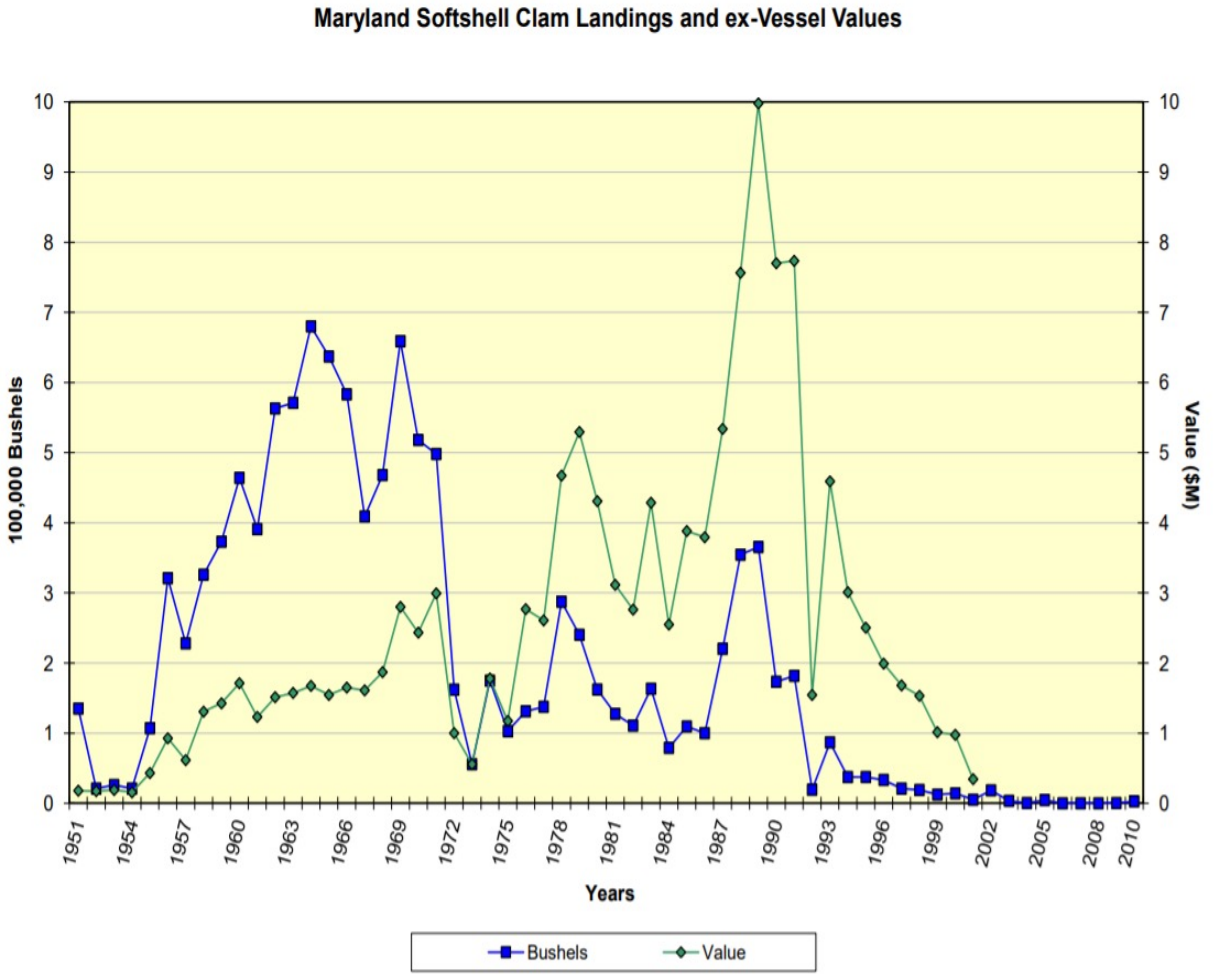
I. Background

1. Economic Value

- Softshell Clams are a historic fishery in Maryland
- Maryland aquaculture lacks diversity.
  - Bay side is low salinity which is perfect for softshell clams.



Credit: Maryland Department of Natural Resources

2. Challenges

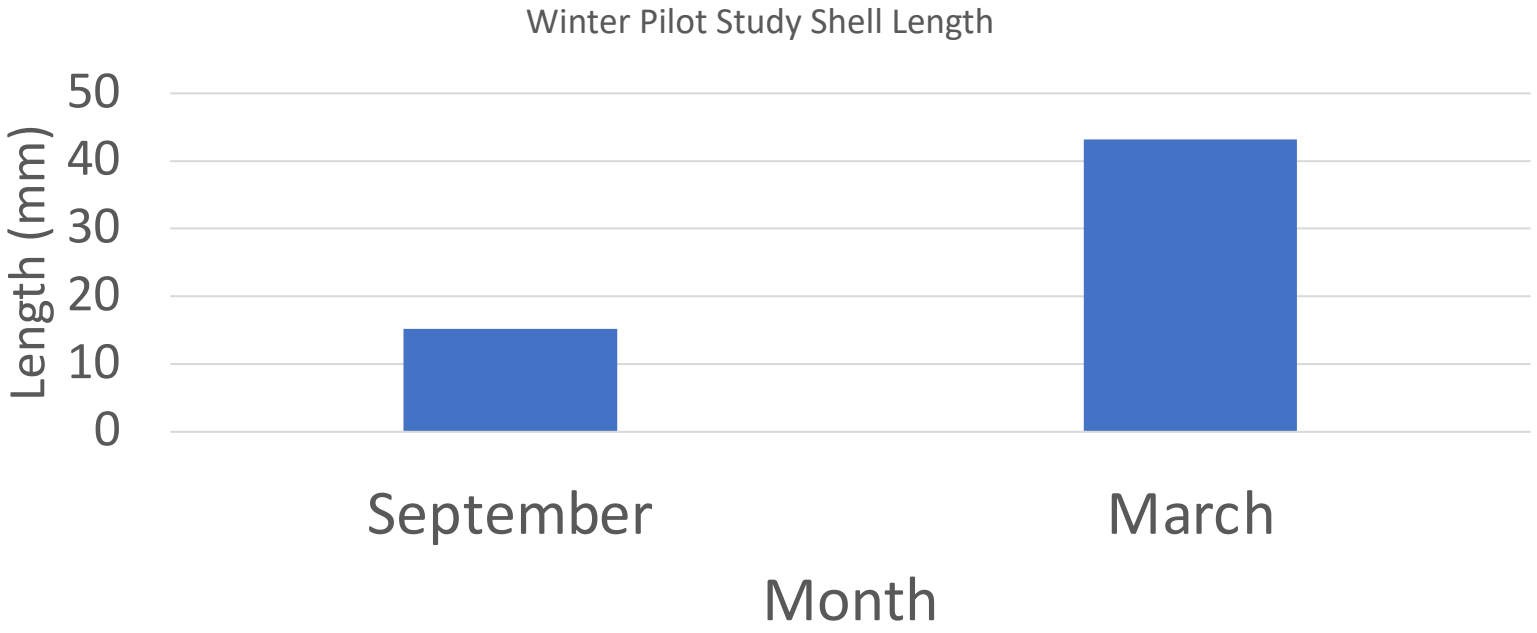
- No local Seed
  - Maine seed may be intolerant to high temperatures.

- Subtidal Culture Method
  - Culture methods used elsewhere are in intertidal zones.
  - Any new methods must balance operating cost and effectiveness.

3. Preliminary Work

(1) Oyster Polyculture

- A cold-water pilot study was conducted by Dr. Ming in the winter, where length increased 2.8 times.

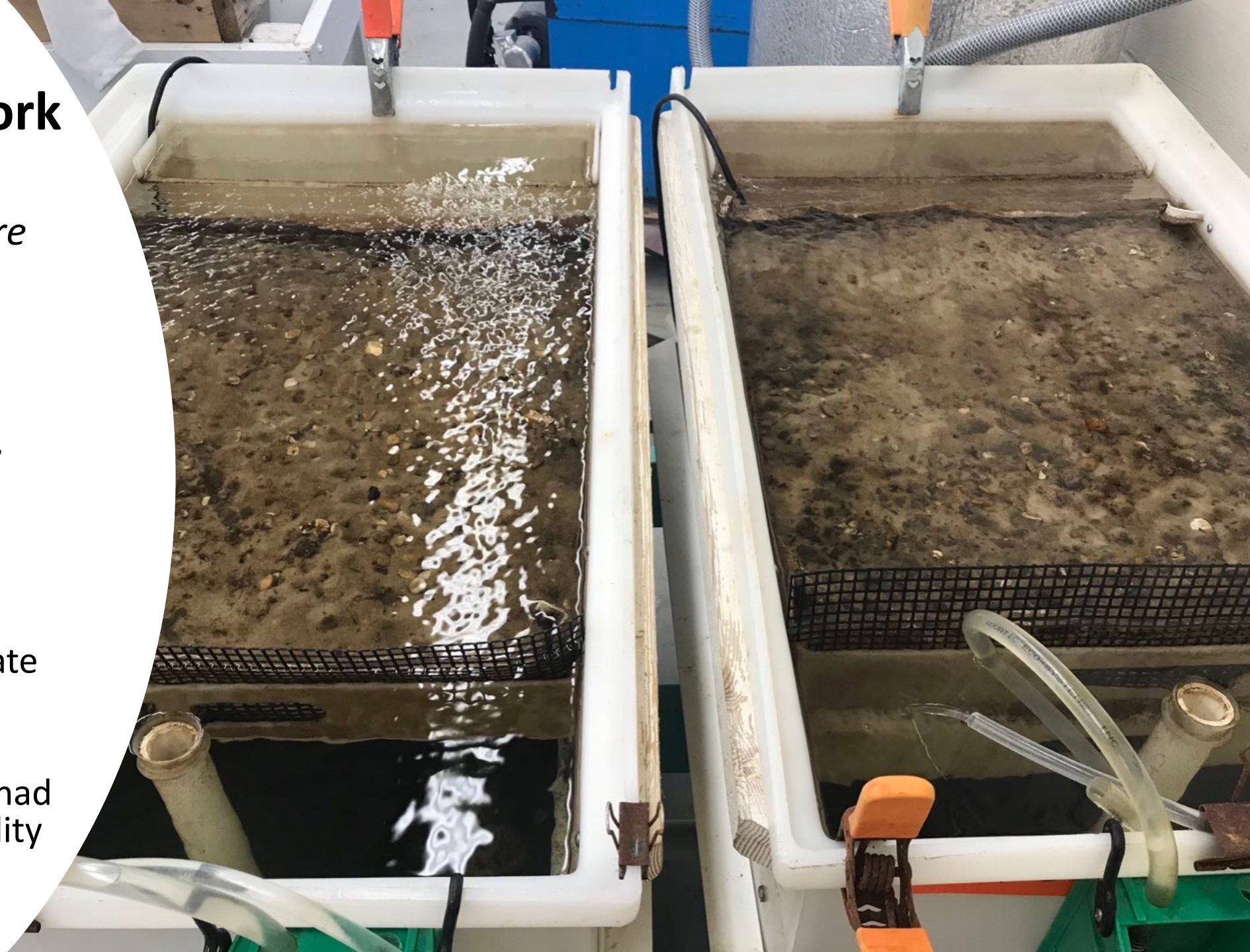


3. Preliminary Work

(2) Sand-based culture

- Maine Seed Clams
- May 6, 2021, to July 6, 2021
- Initial Average Length: 11.79mm
- End Length: 20.33mm
- Combined mortality rate was 5.2%

- Clams both grew and had a relatively low mortality rate.



II. Study Objectives

1. Test if Maine seed can survive Maryland summer water.

2. Determine which method is most successful.

III. Methods and Results

1. Oyster polyculture

Method:

- Combined Clams with oysters.
  - May allow for symbiosis.
- Three horizontal bags:
  - 300 Clams
  - 300 Clams + 300 Oysters
  - 300 Clams + 1000 Oysters

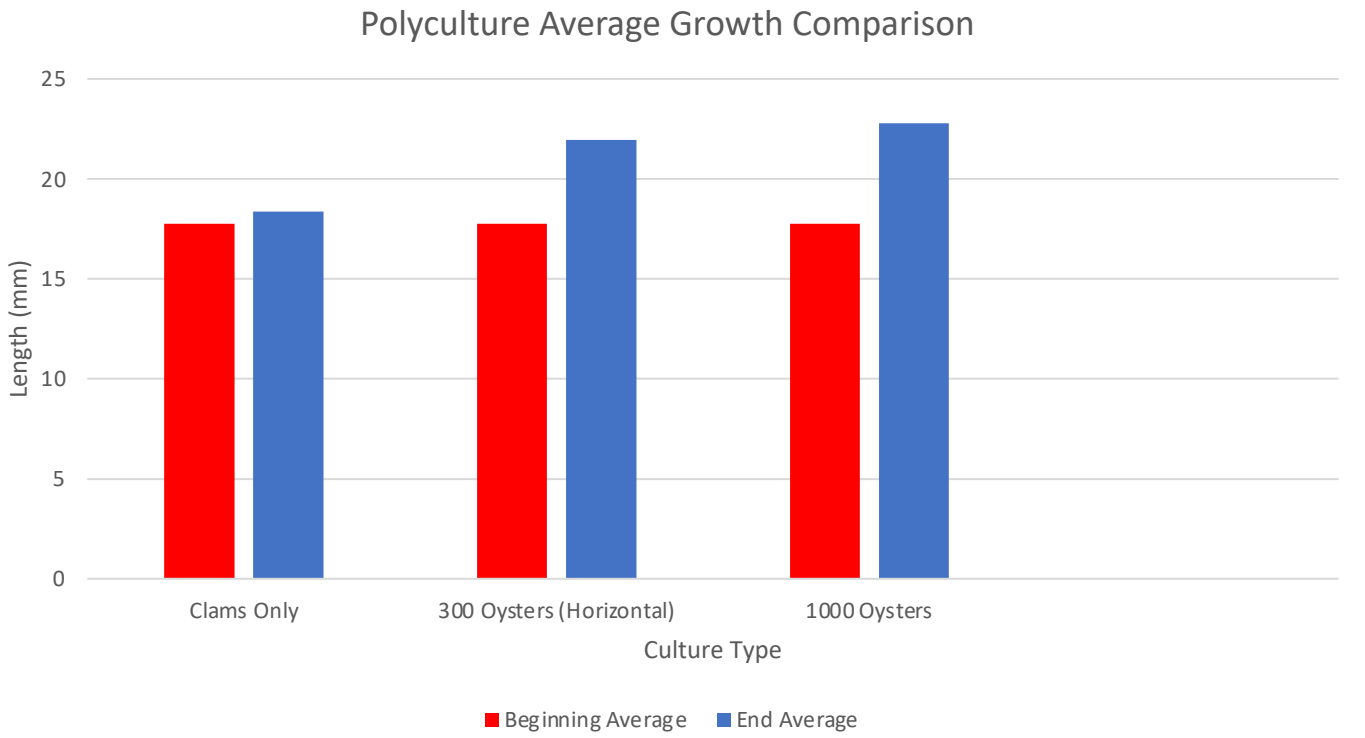
1. Oyster polyculture

Result:

- All populations crashed, only one alive found in high density bag.
- Both bags with oysters showed significant growth.
- High density bag shows faster growth than other bags, but the t-test is not significant.

**P<0.001

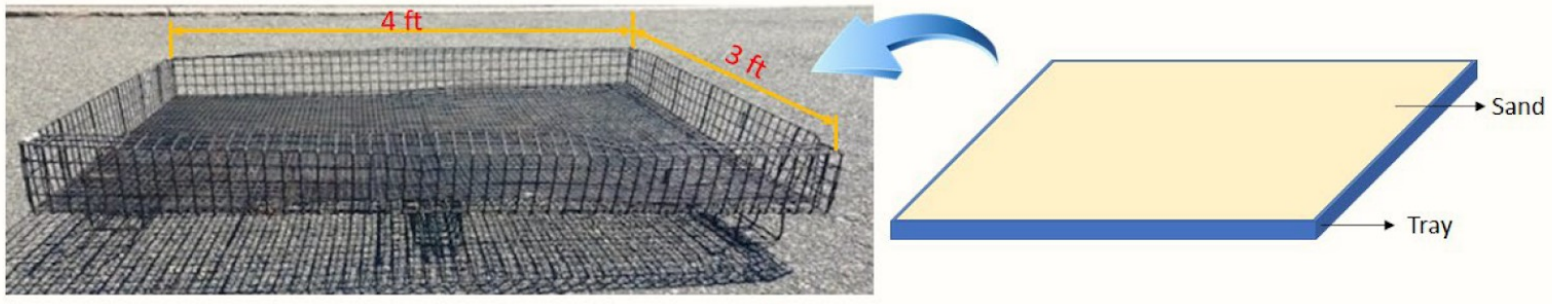
	Beginning Average	End Average
Clams Only	17.76	18.35
300 Oysters	17.76	21.94
1000 Oysters	17.76**	22.78**

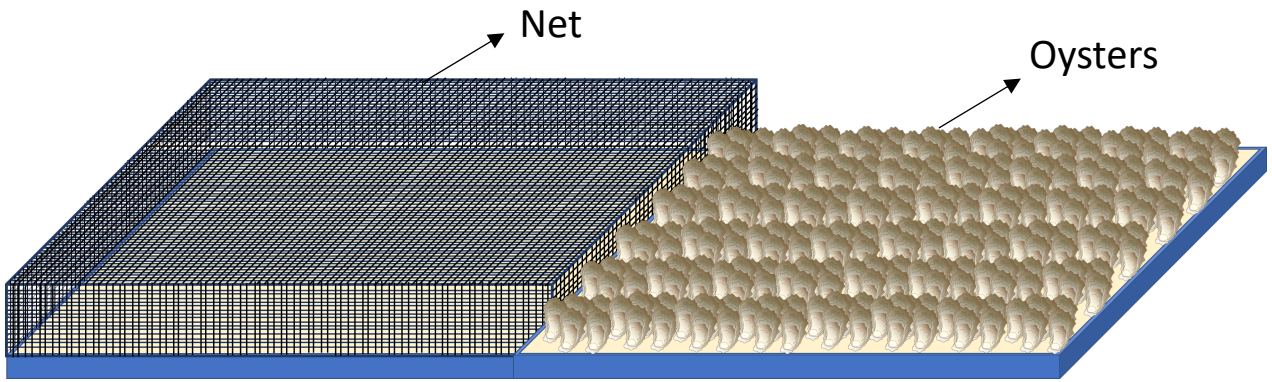


2. Sand-based Culture

Method:

- Tray allows for clams to bury themselves in sand while also giving protection from predation.
- Testing both man-made cover and natural oyster coverings.
- July 6, 2021, to July 28, 2021



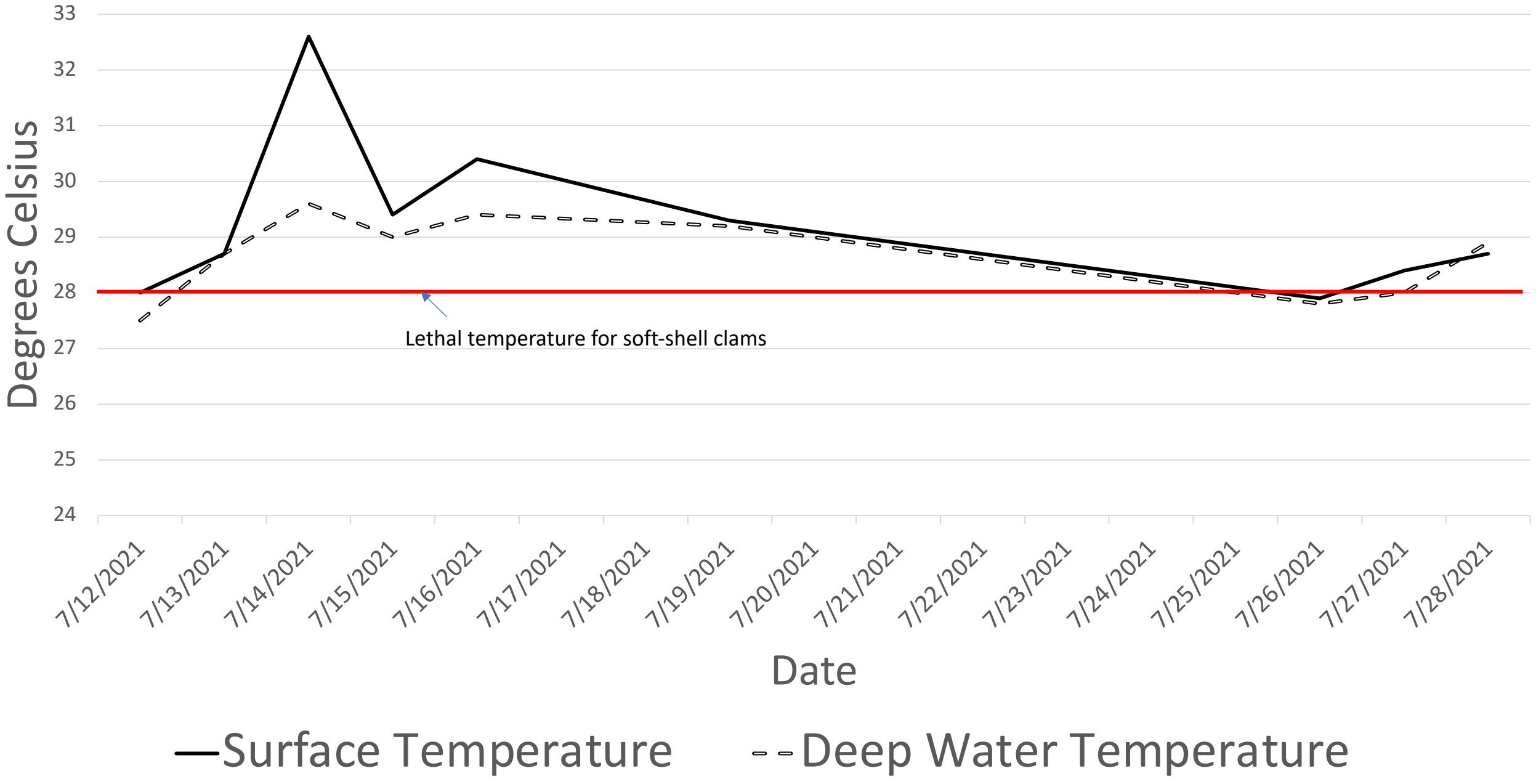


2. Sand-based Culture

Result:

- Trays were sifted to collect clams
  - No surviving clams, oysters survived
- Beginning Average Size: 17.76mm
- End of test Size: Not taken due to crash

Water Temperature During Culture



IV. Conclusions

- Previous tests occurred in cold weather. Maine seed cannot survive Maryland summer temperatures.
- Despite crashing, polyculture method showed growth. High density culture showed greatest growth.
- Polyculture method is easier in operation when compared with sand-based method. Another trial should be run from September to May.
- This study demonstrated that high temperature was the biggest threat to softshell clams. A heat tolerant line may be worth the development.

Acknowledgements

- This study is sponsored by Morgan State University Office of Technology Transfer.
- Special thanks to:
  - Dr. Ming Liu
  - Dr. Amanda Knobloch
  - Brittany Wolfe
  - Kyle Woods
  - Jon Farrington

Thank you for your attention!

Any questions?