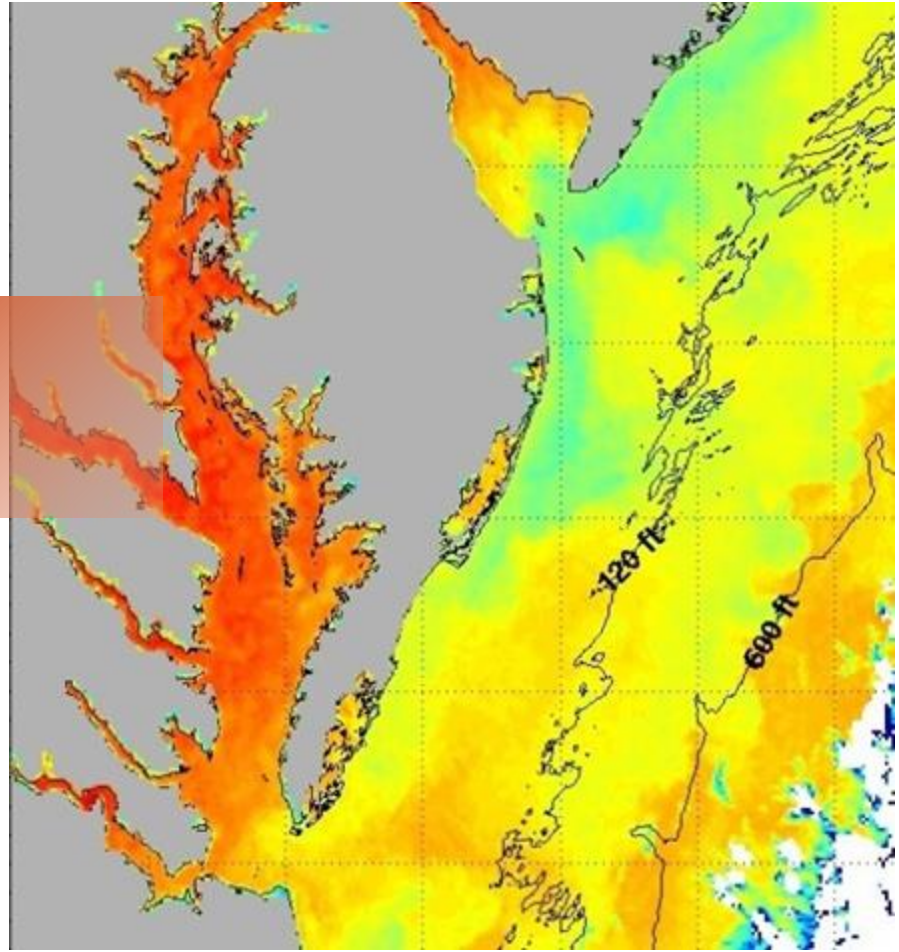
In Hot Water: Analyzing Mortality Patterns in Soft Shell Clams Under Thermal Stress

TABLE OF CONTENTS

BACKGROUND

01



ABOUT THE PROJECT

- The need for aquaculture resilience
- Soft shell clam as a candidate... heat as a problem

Project Goals

Assess heat-stress mortality via three factors

1. Size
2. Age
3. Gear

Determine genetic control of heat tolerance

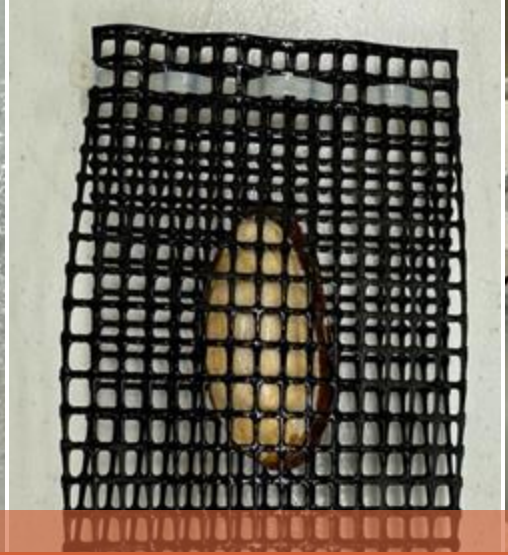
1. Determine gene sequence with tissue samples
2. Selectively breed a heat-tolerant clam

Times featured online/on the news: 9

METHODS

02

Experimental Design



Grouping

Tank 1: Naked (n=223)

Tank 2: Sandwich (n=94)

Tank 3: Sand Bottle

(n=75)

Tank 4: 1 and 2 year old juveniles (n=323, 119)

Temperature

Tanks were ramped at 1°C per day until a temp of 28°C or higher from natural water temp

Monitoring

Mortality checks were performed

daily

Genetic sampling was performed

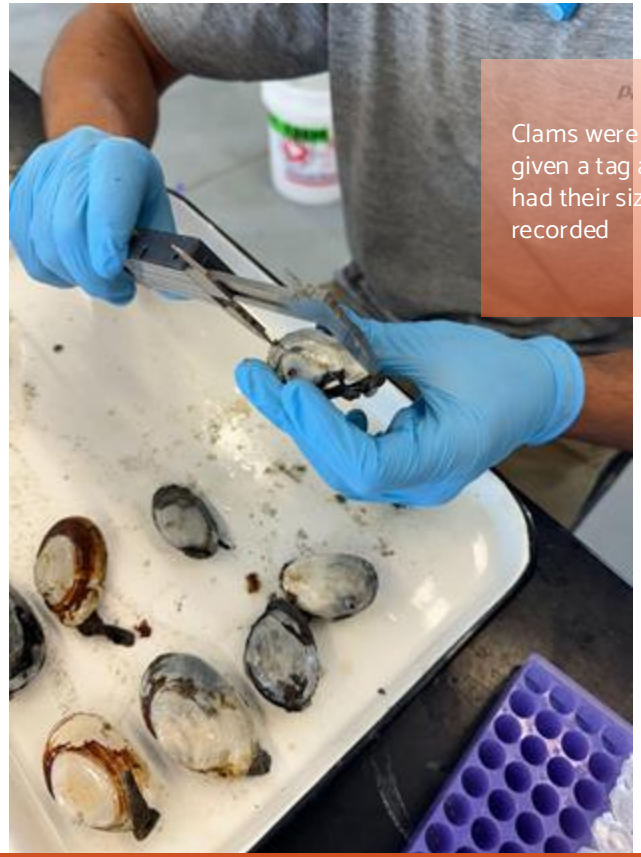
on all frozen mortalities

Temp was continuously recorded

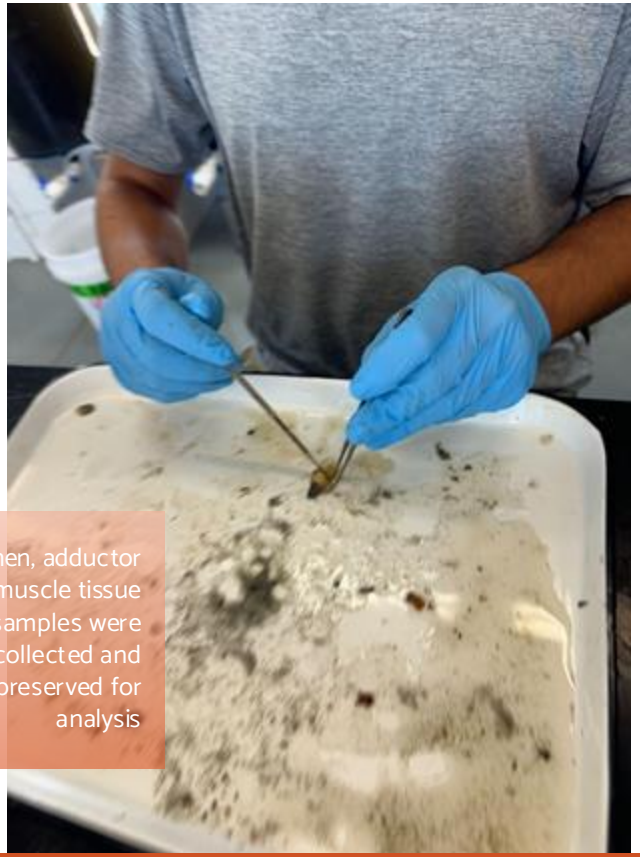
and water changes were performed as needed

Temperature Monitoring

Genetic Sampling



Clams were given a tag and had their size recorded



Then, adductor muscle tissue samples were collected and preserved for analysis

Total Dead Clams: 765

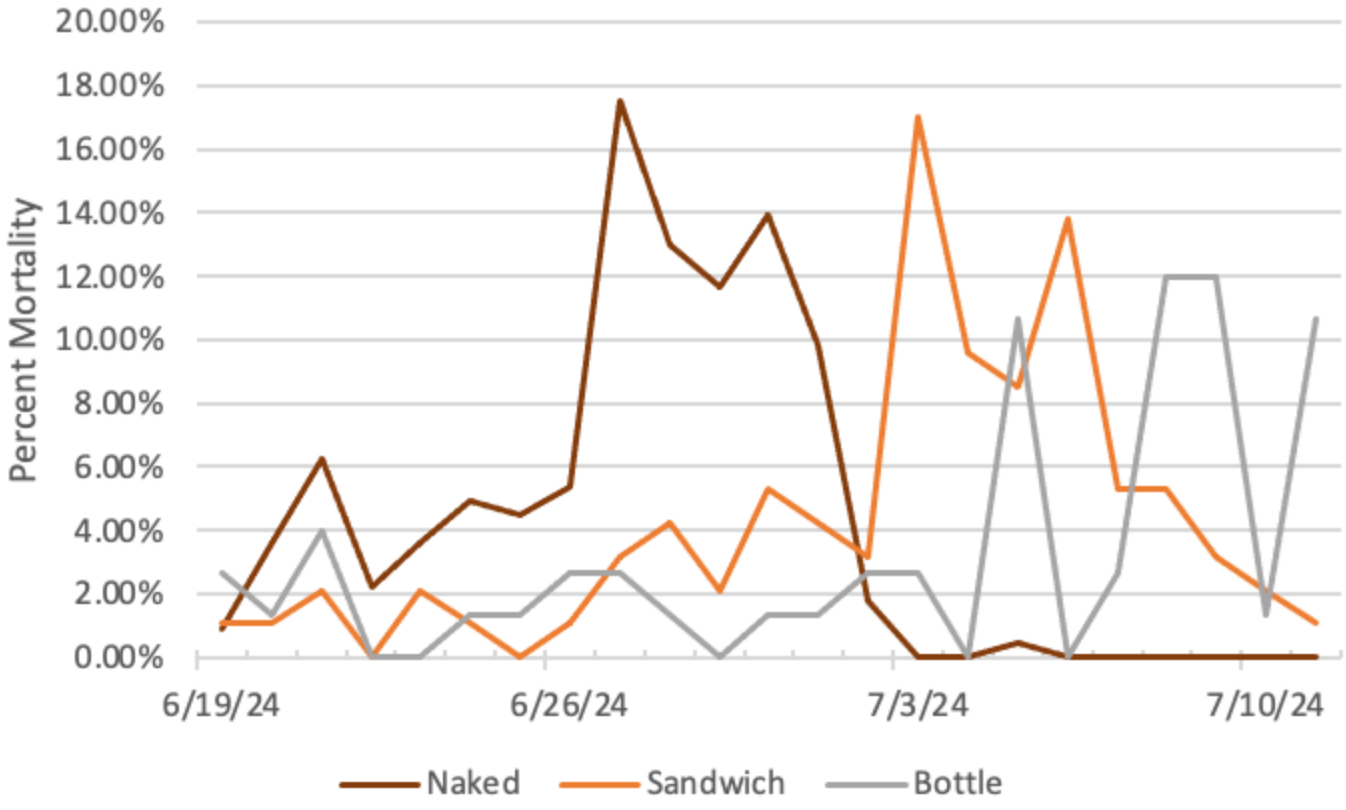
Time Spent Sampling: 25 hours

Total Caliper Distance: 105 feet

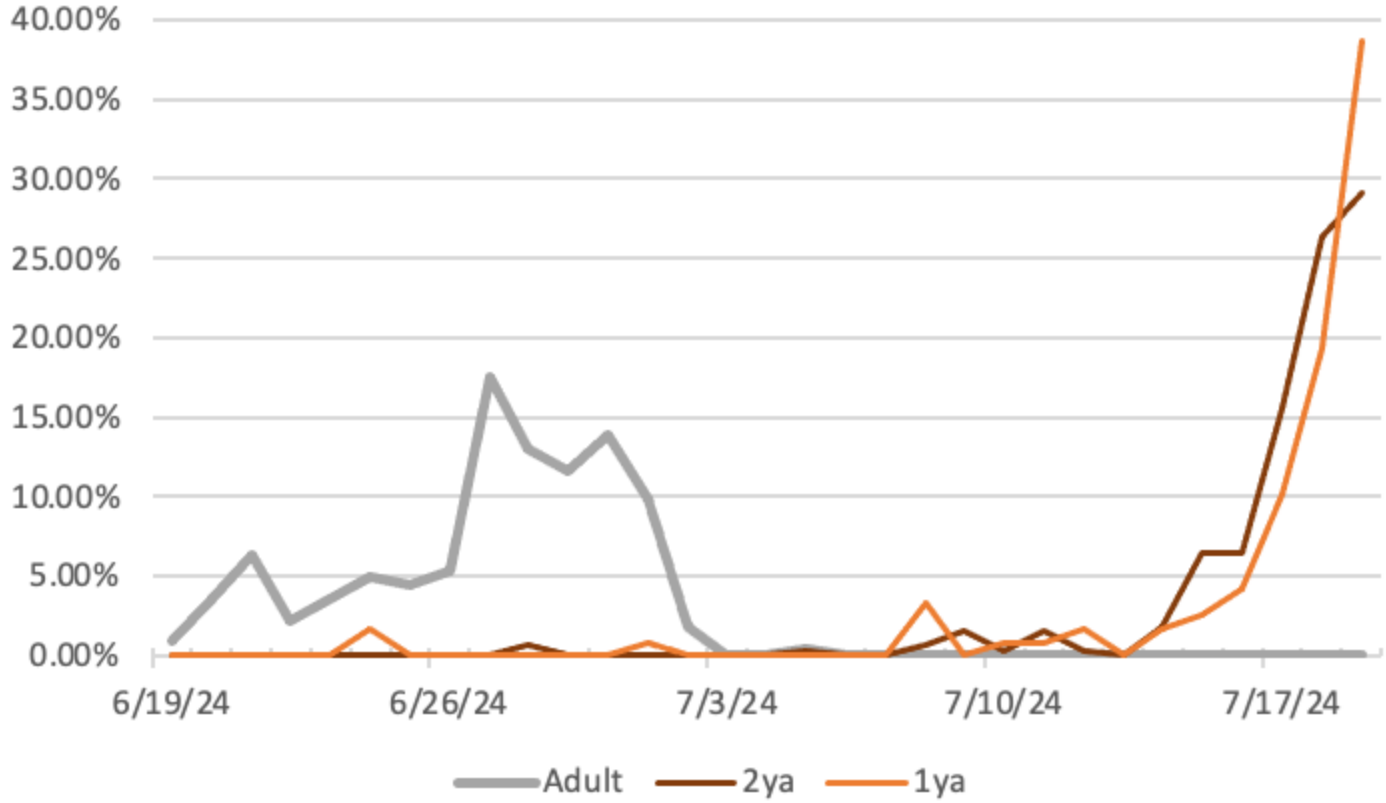
RESULTS

03

Mortalities by Group



Mortalities by Age

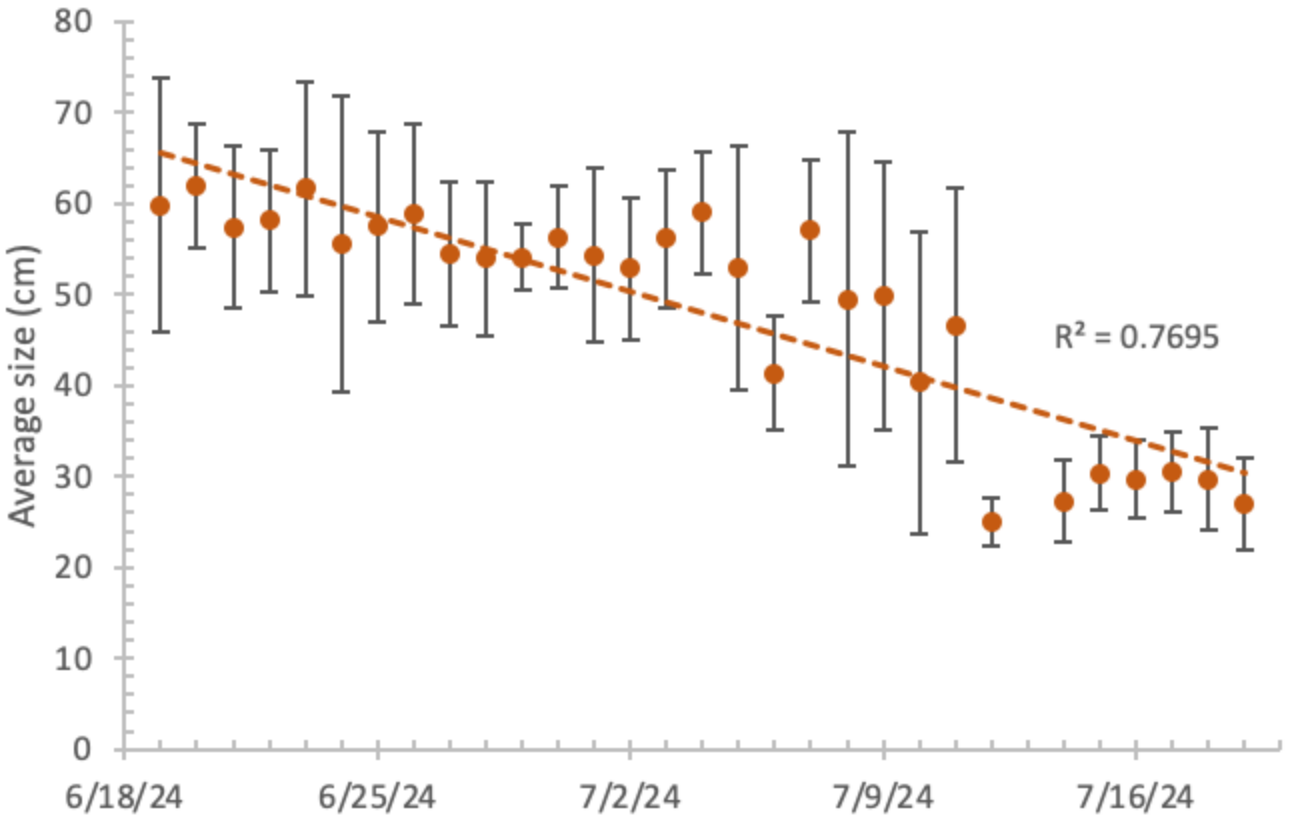


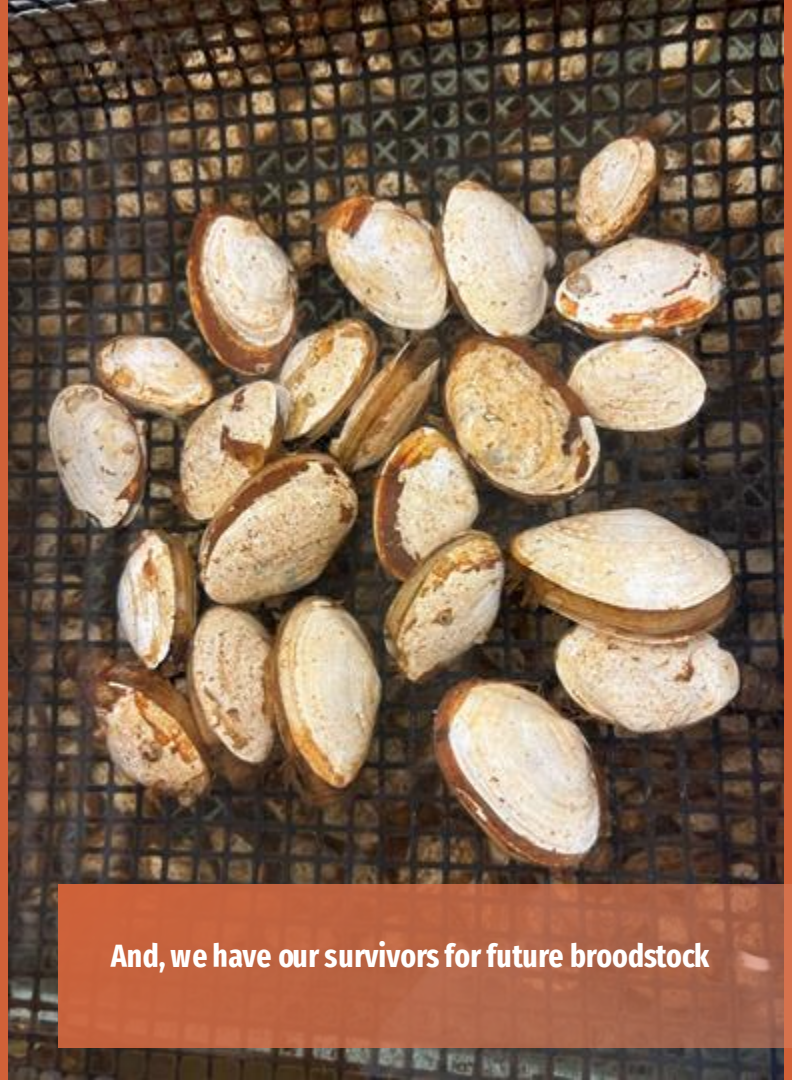
Average Sizes-
1ya 22mm

Adult: 56mm

2ya: 31mm

Average Size by Day





And, we have our survivors for future broodstock

CONCLUSIONS

04

Conclusions

Age

Juvenile soft shell clams have stronger heat tolerance than adults

Gear

Sand based housings allow for the longest periods of heat tolerance, and compression gears are better than loose (naked) clams

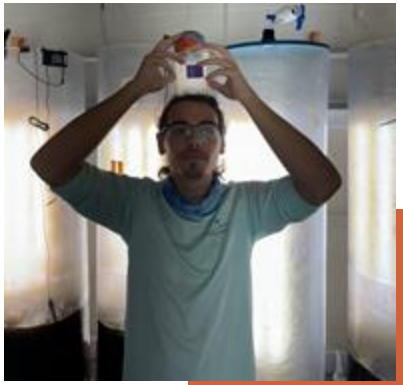
Size

While there is some correlation between size and heat tolerance, the large margin of error doesn't allow for a relationship to be declared

Genetics

We have all genetic samples and survivors for the future work of gene determination and line creation

Acknowledgements



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7. All the other interns who provided support along the way
8. The Aquaculture Intern Tape Ball ♡

Tape ball Weight: 211g


Thank You