



## 2023 & 2024 Clam Fecundity Study

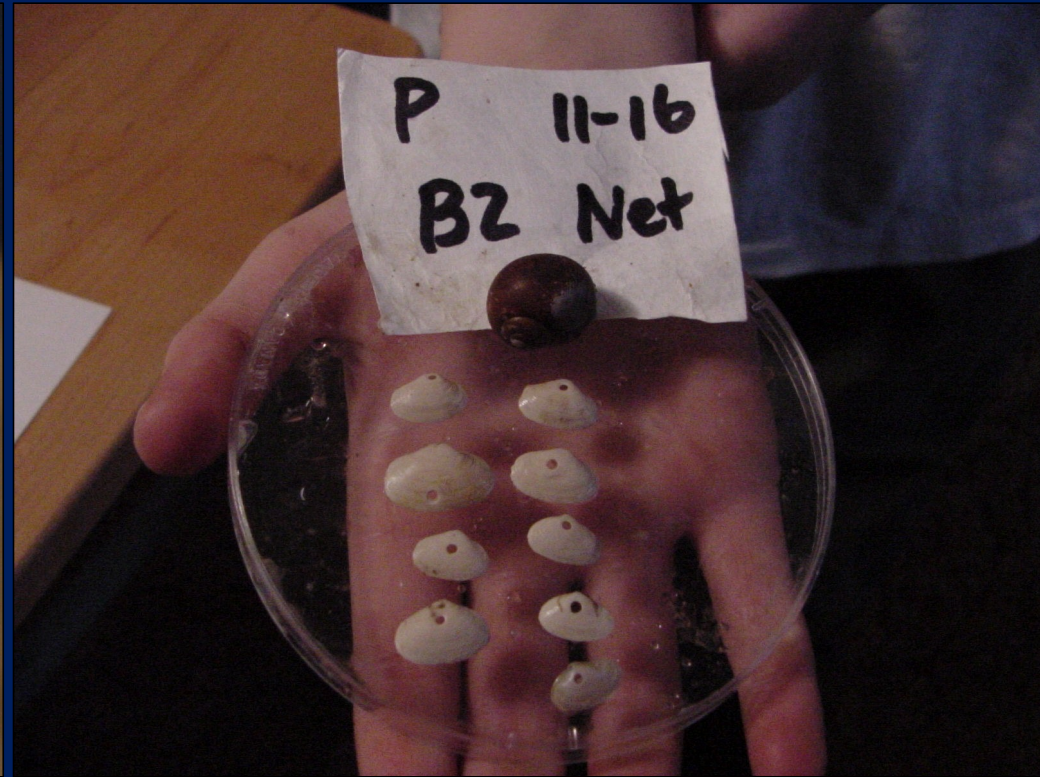
Dr. Brian Beal (PI) & Sara Randall (Co-PI)

Brunswick Shellfish Committee  
Bremen Shellfish Committee  
Jonesport Shellfish Committee



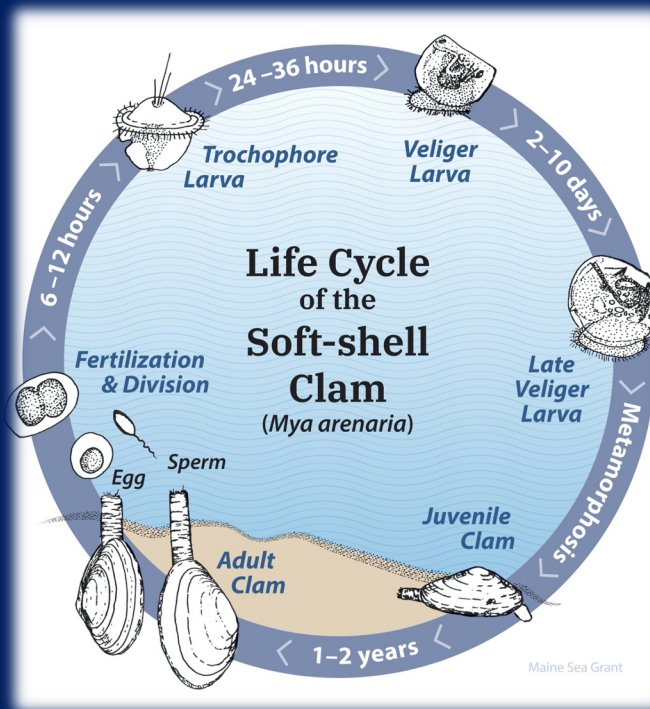


Non-human predation is the culprit that explains the majority of the losses.



Here's what we can say with a high degree of confidence:

*Fewer and fewer clams from each year's spawn are surviving their first year of life.*





## Clam Fecundity-

Their ability to produce new offspring.

- Lack of published studies examining reproductive output of clams.
- This is the first large-scale assessment of clam reproductive output.

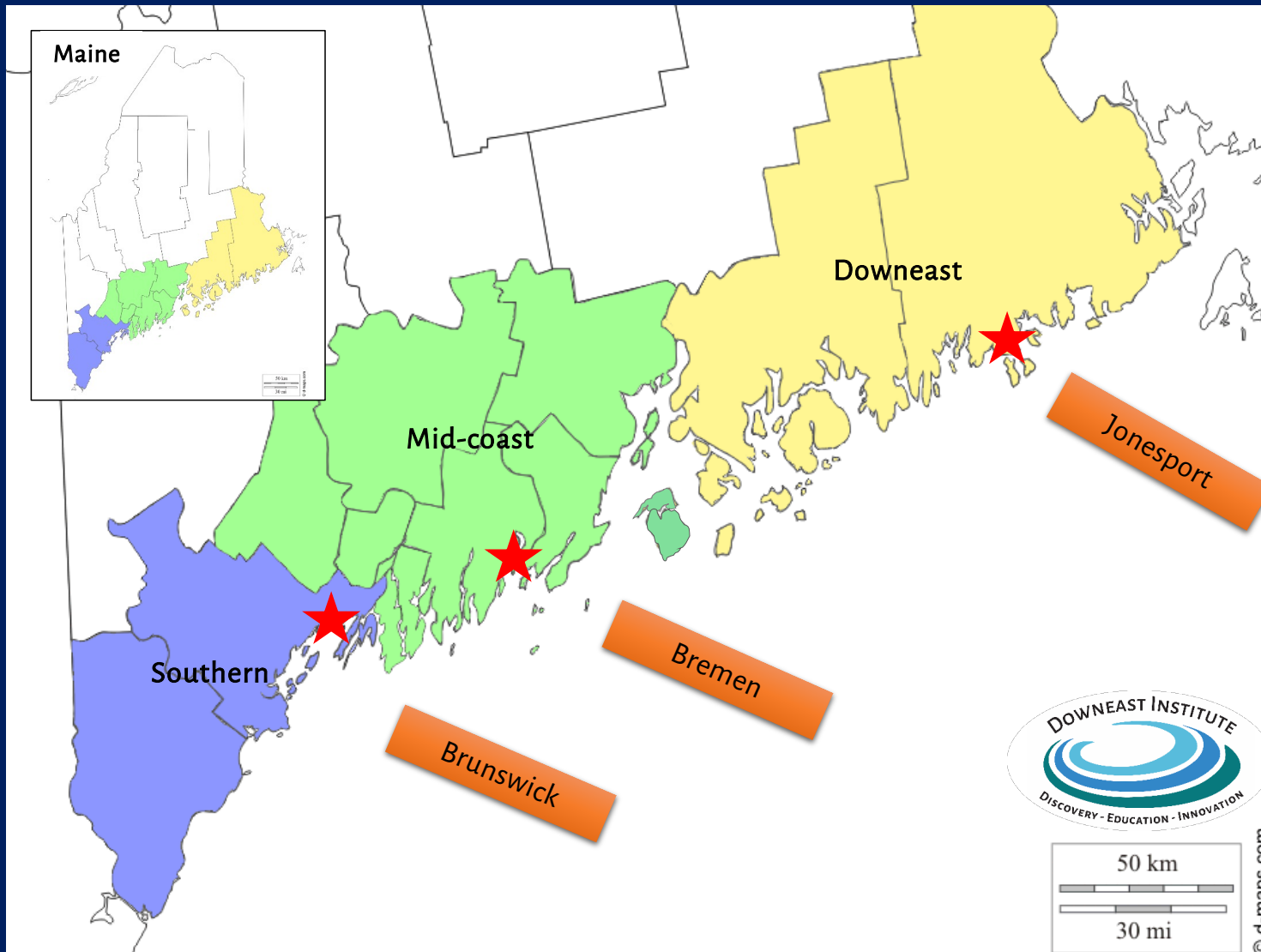


Is it possible for clams to “swamp out” predation?

## The Fecundity Study

- 1) Time of year when reproduction occurs, and duration;
- 2) If there is a relationship between clam size and number of eggs produced;
- 3) If tidal height (high vs. mid vs. low) plays a role in reproduction;
- 4) How geography (southwest vs. mid coast vs. downeast) affects timing and/or size-egg number relationship; and,
- 5) Viability of spawned eggs as it relates to clam size, geographic region, tidal height, and time during the spawning season.

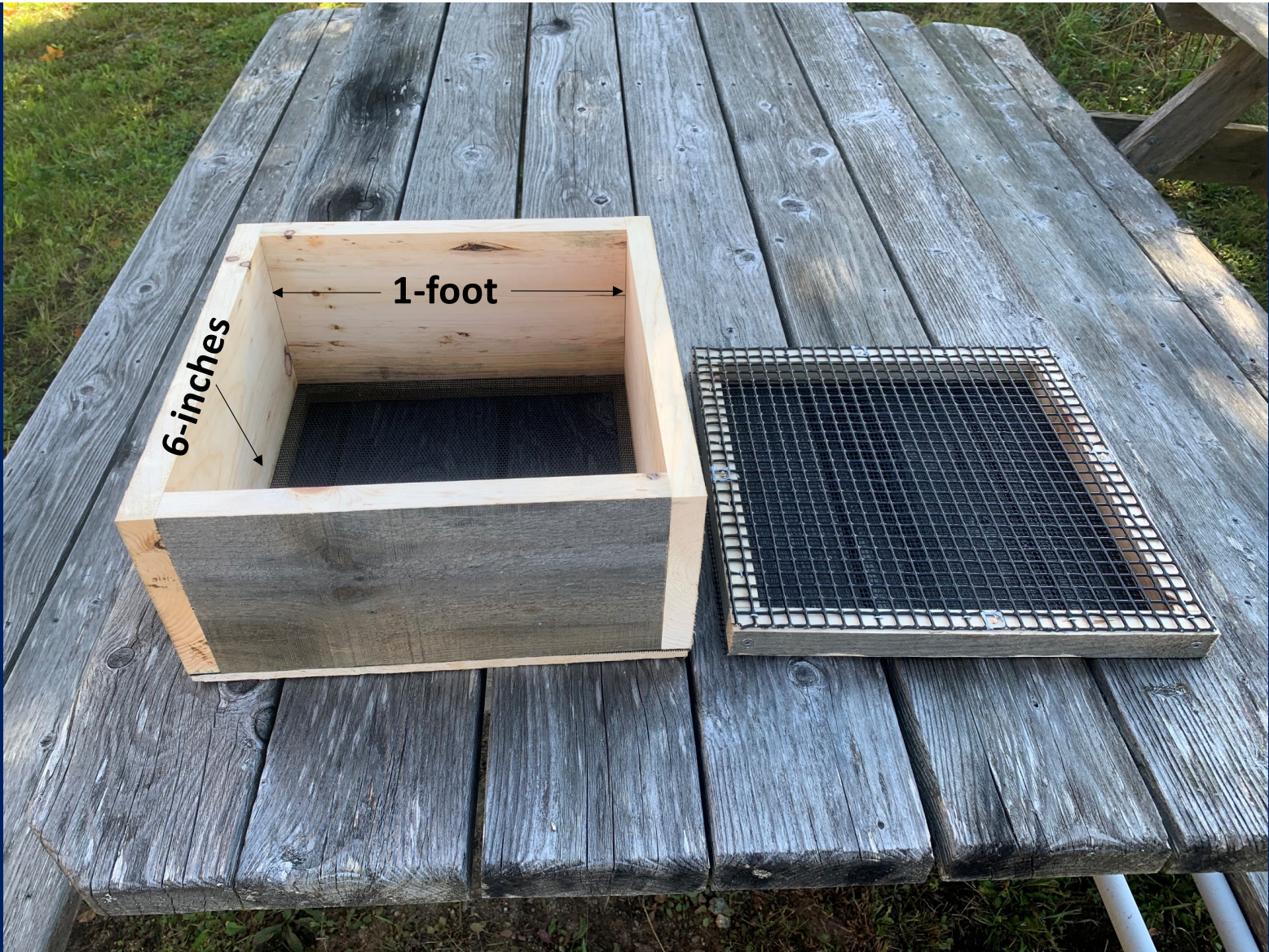




# Field Schematic

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42







Upper Intertidal

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42

Mid Intertidal

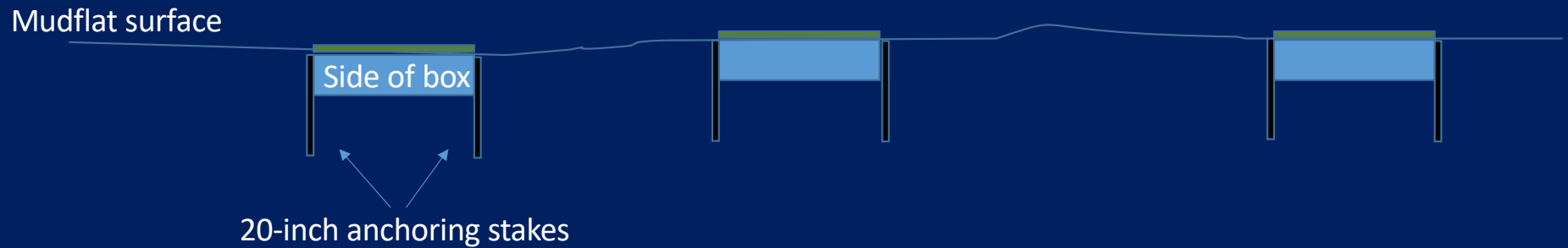
1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42

Low Intertidal

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42

March 2023

126 boxes in  
each town



Each box will contain 5 clams from each of 6 size categories (N = 30/box)

Size Categories:

- I: 30-39 mm, or 1.2- to 1.5-inches (42 b x 5 c x 3 h) = 630
- II: 40-49 mm, or 1.6- to 1.9-inches (42 b x 5 c x 3 h) = 630
- III: 50-59 mm, or 2.0- to 2.3-inches (42 b x 5 c x 3 h) = 630
- IV: 60-69 mm, or 2.4- to 2.7-inches (42 b x 5 c x 3 h) = 630
- V: 70-79 mm, or 2.8- to 3.1-inches (42 b x 5 c x 3 h) = 630
- VI: 80-100 mm, or 3.2- to 3.9-inches (42 b x 5 c x 3 h) = 630

TOTAL Per Town: 3,780 clams

# Field timeline and activities

<u>Date</u>	<u>Activities</u>	<u>People</u>
March 2023	Establish the experiment (126 boxes) each seeded with 30 clams. Three tides.	3 clammers @ \$450/tide
April-August (19 weeks)	Each week, remove all clams from two boxes from each of the three tidal heights, and FedEx clams to DEI	1 clammer @ \$450/tide
June/July	Travel to DEI to participate/observe a clam spawning event	1 clammer @ \$450

# Lab Plan

Clams, once harvested will be delivered to DEI to be spawned.

- Placed in spawning tanks, partitioned by size category, tidal position
- Spawn
- Once spawning, females will be separated from males and individually placed into 3-L containers with seawater
- 3 subsamples of the water will be taken
- Count and measure eggs from 3 subsamples
- Fertilize a subset of eggs from all size ranges and count those (assessment of egg viability).

Record, enter & analyze data

**Do it all over again in 2024!**

An underwater photograph showing a diver in the background and a large clam shell in the foreground. The water is dark blue and slightly murky. The clam shell is light-colored with concentric growth lines. The diver is wearing a dark wetsuit and a mask, and is positioned in the center background. The clam shell is on the left side of the frame, partially open. The text is overlaid in the center of the image.

National Marine Fisheries Service  
(NMFS),  
Department of Commerce  
FY22 Saltonstall-Kennedy  
Competition