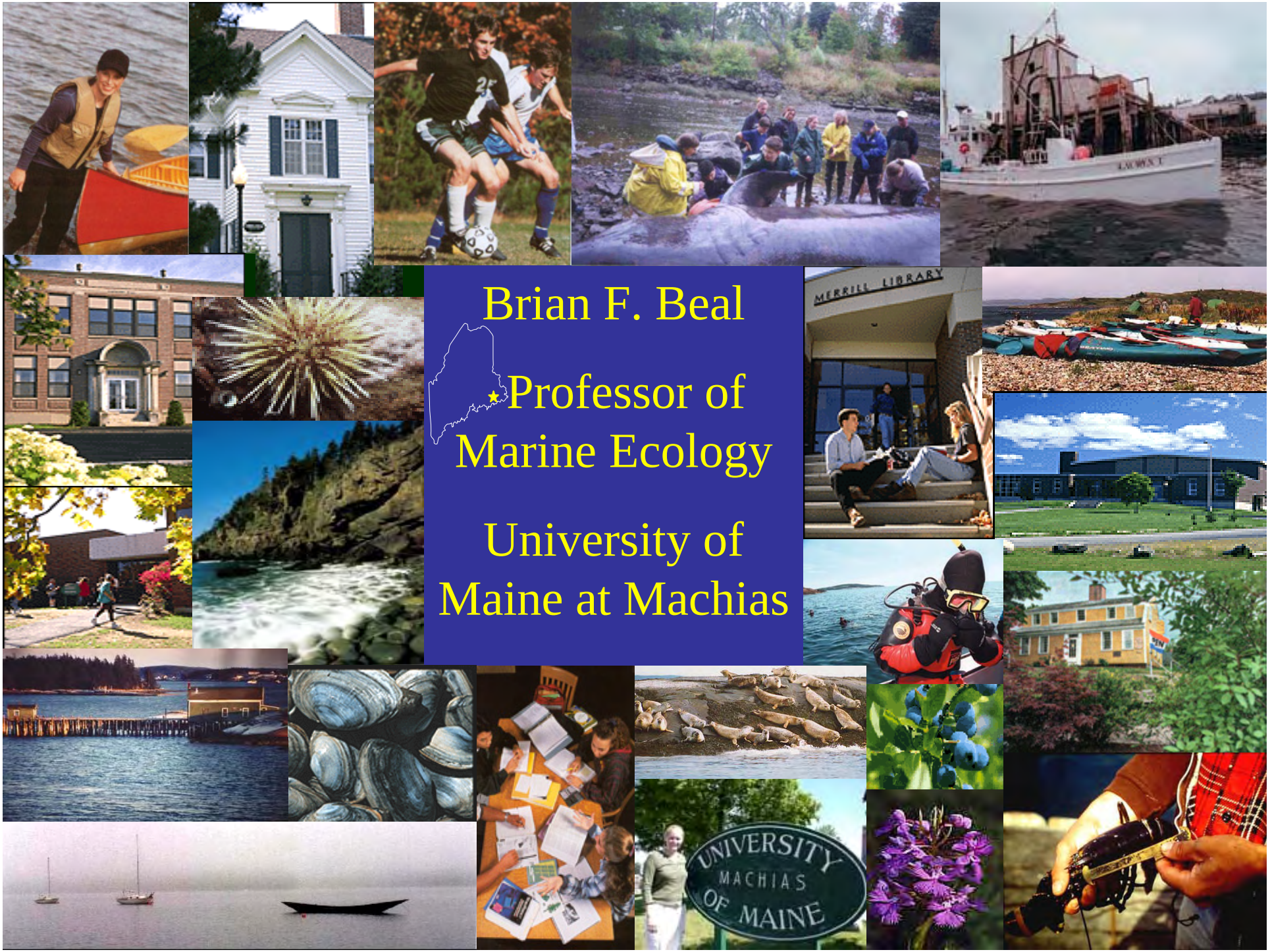
Brian F. Beal
Professor of
Marine Ecology
University of
Maine at Machias
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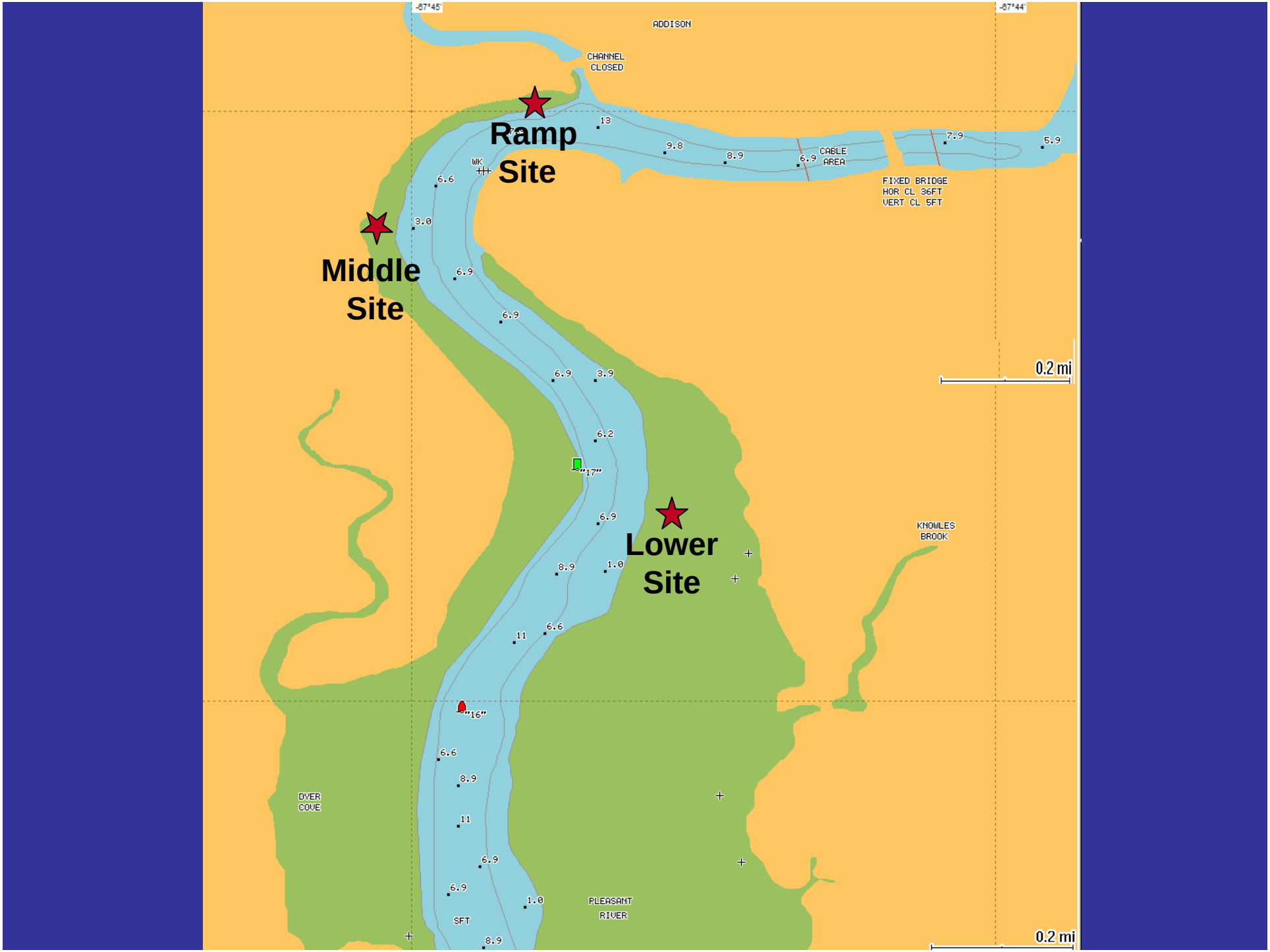
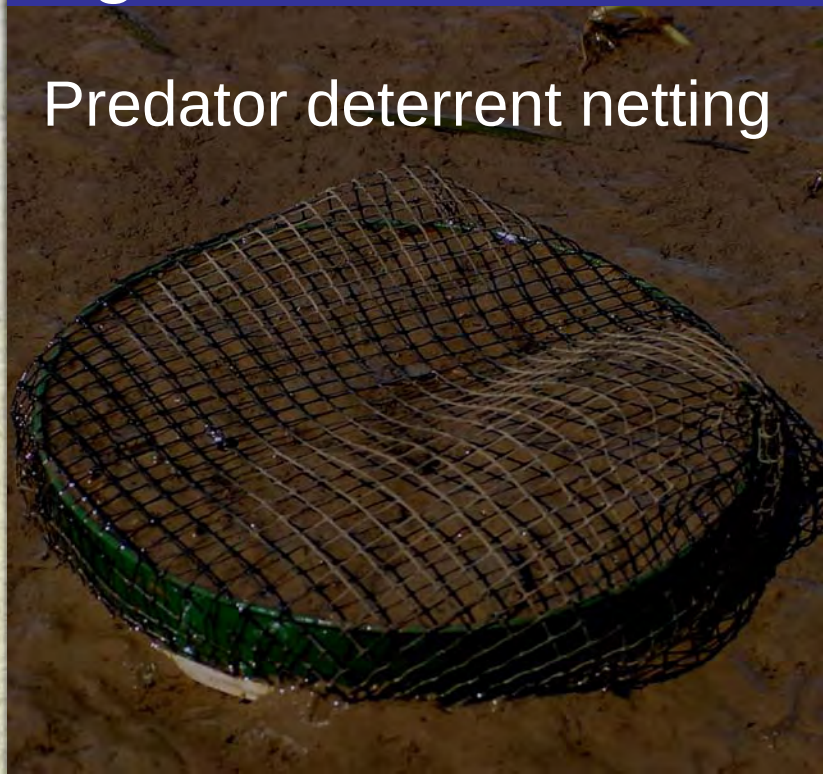
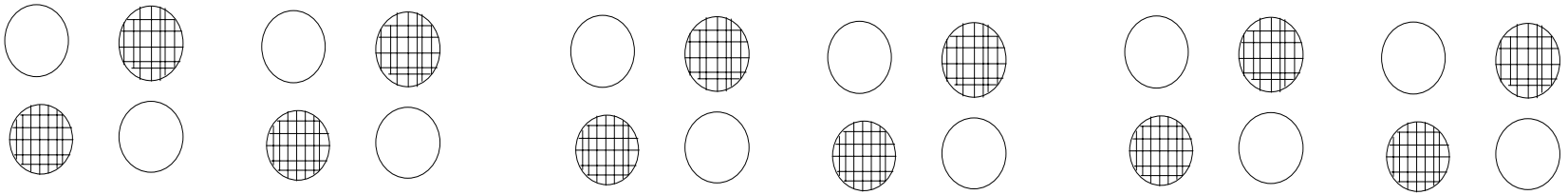

Ramp Site
Middle Site
Lower Site
ADDISON
CHANNEL CLOSED
CABLE AREA
FIXED BRIDGE
HOR CL 36FT
VERT CL 5FT
WK
KNOWLES BROOK
DYER COVE
PLEASANT RIVER
SFT
0.2 mi
0.2 mi

Effects of tidal height, predators, and distance away from the Town landing on clam growth & survival



Predator deterrent netting

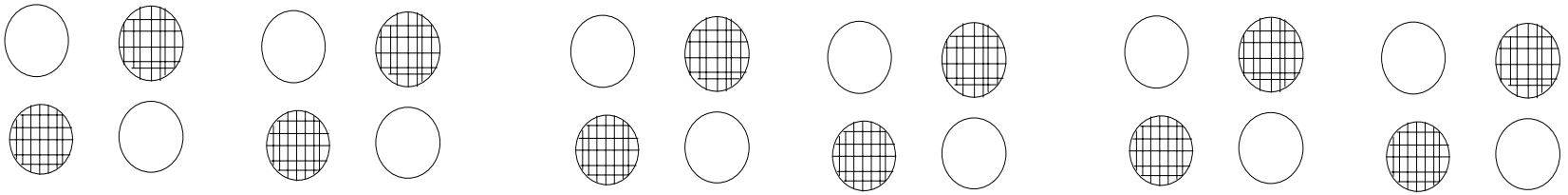
Upper Intertidal



Block I Block II Block III Block IV Block V Block VI

12 clams per pot ≈ 60 ft^{-2}

Lower Intertidal



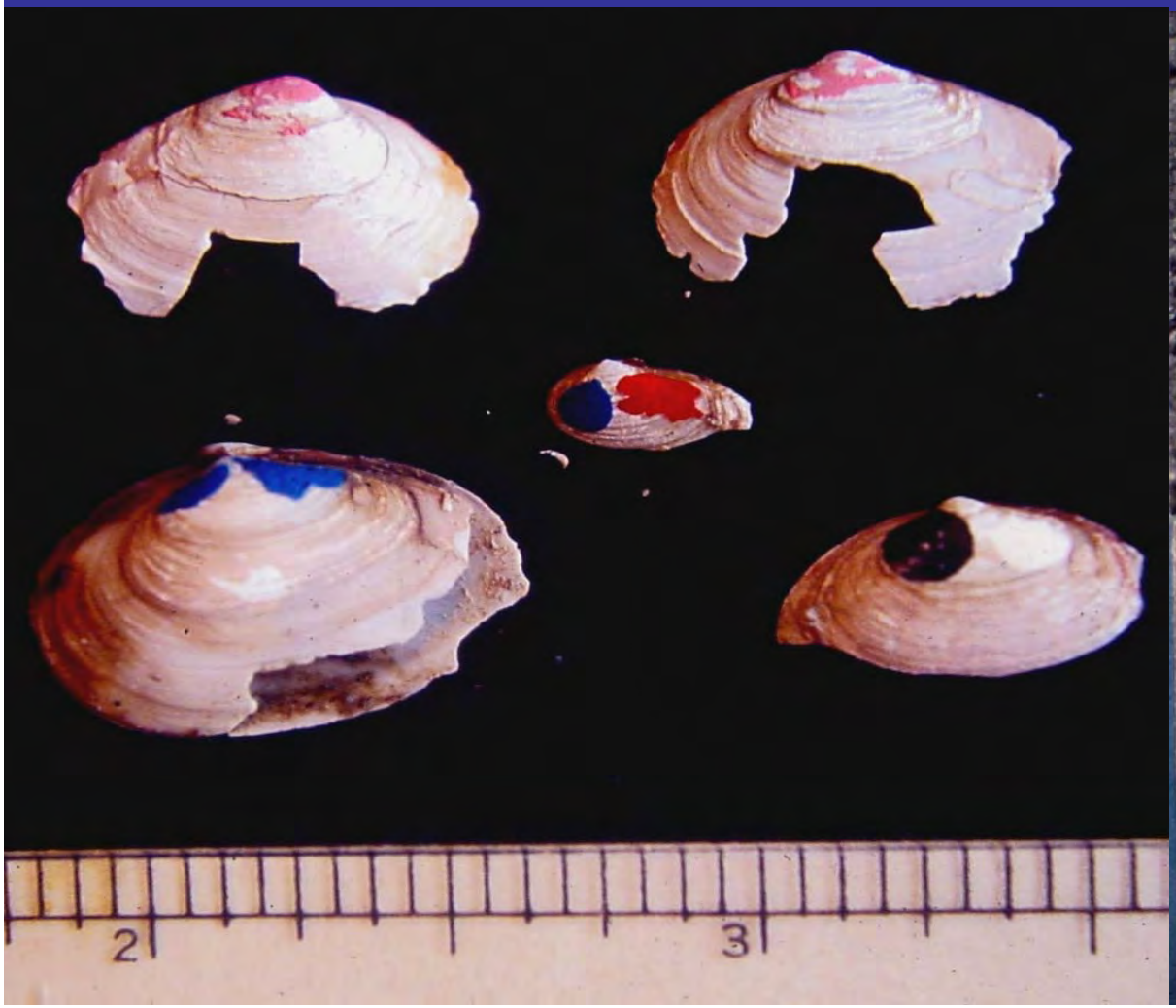
Block I Block II Block III Block IV Block V Block VI

What was measured at each location?

- **Average survival of clams per pot**
  (e.g., 5/12 = 42%; 9/12 = 75%; 11/12 = 92%)

What was measured at each location?

- **Average mortality rate of clams due to predators per pot (e.g., 5/12 = 42%; 9/12 = 75%; 11/12 = 92%)**

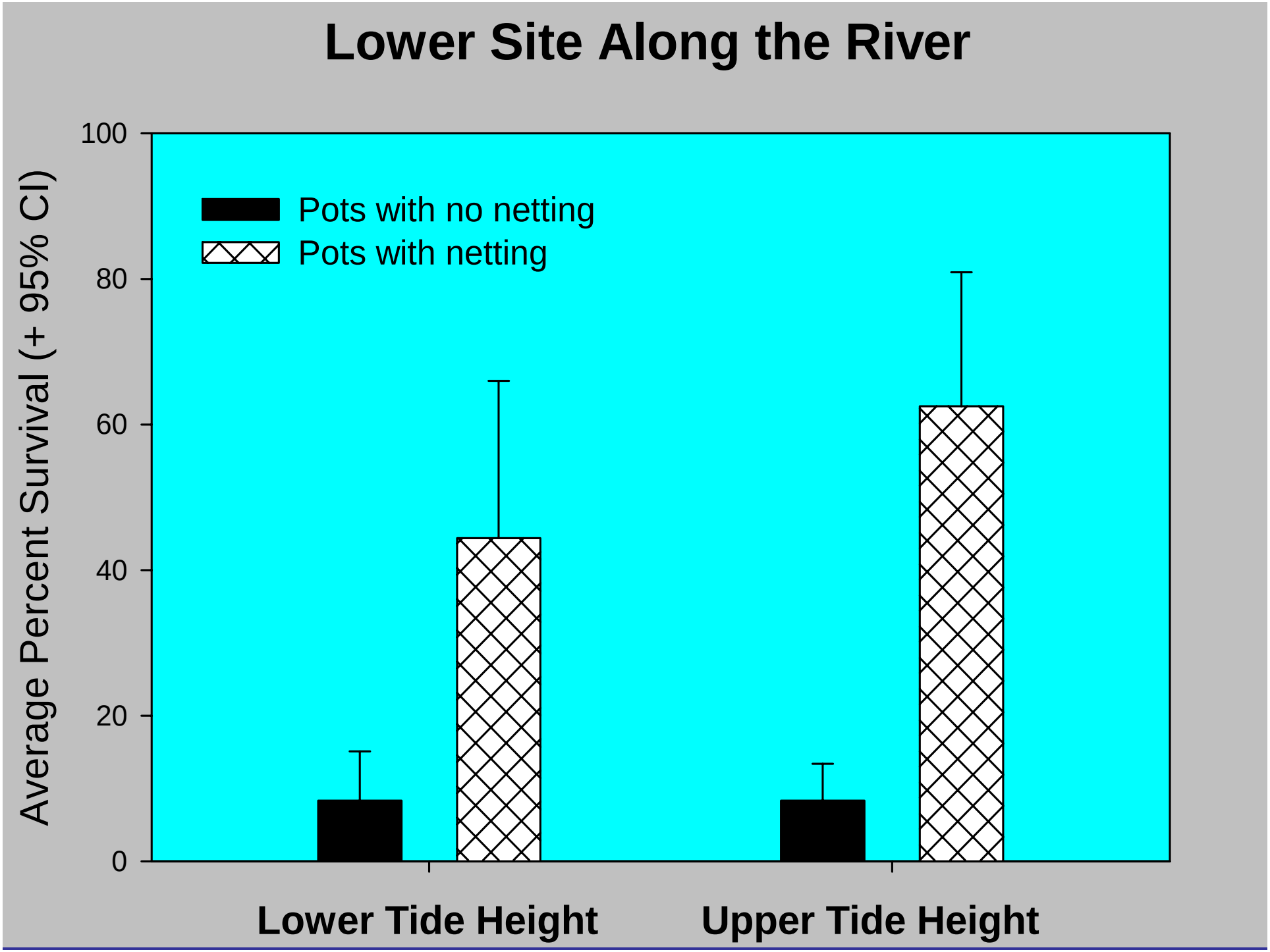


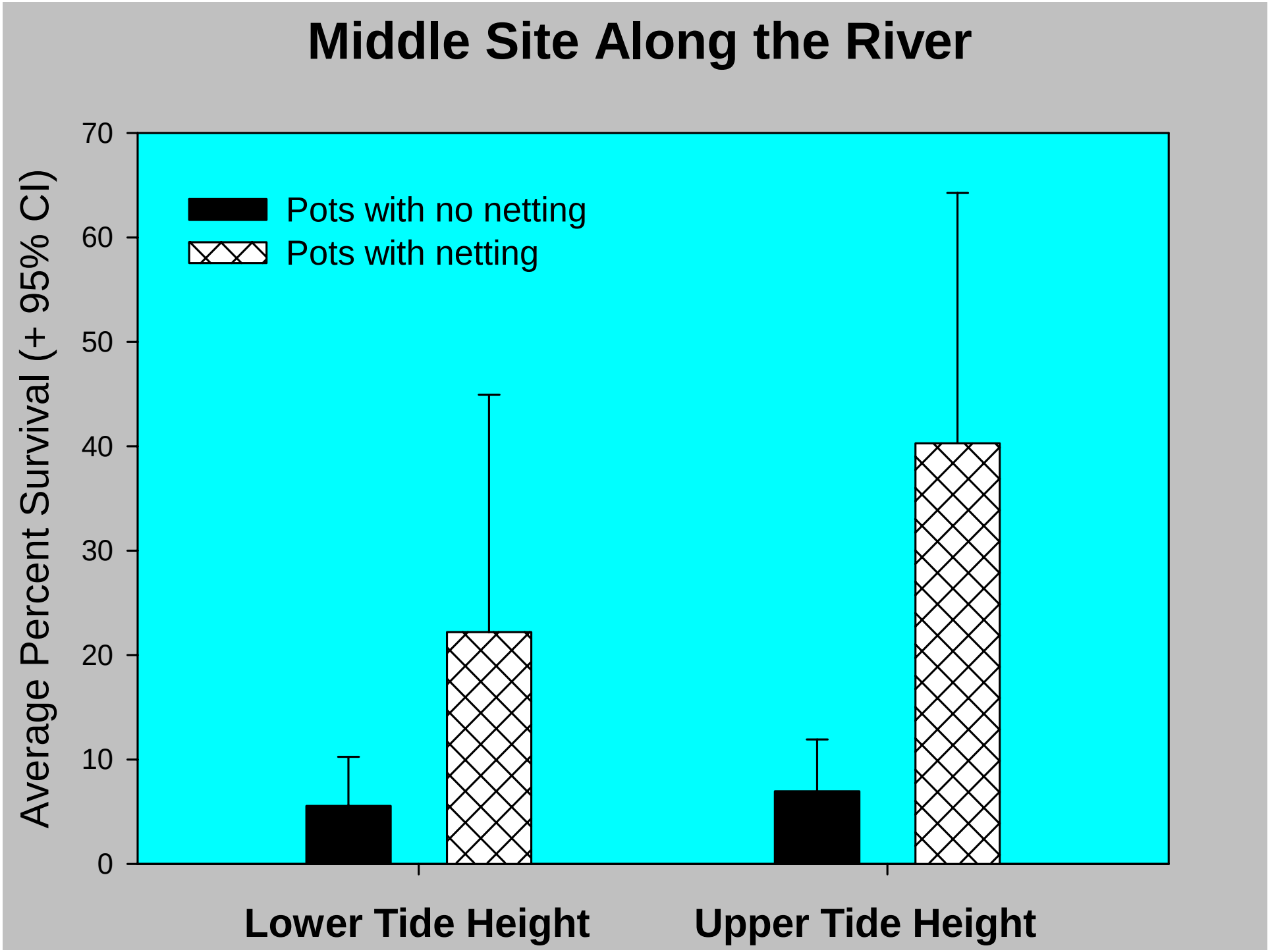
What was measured at each location?

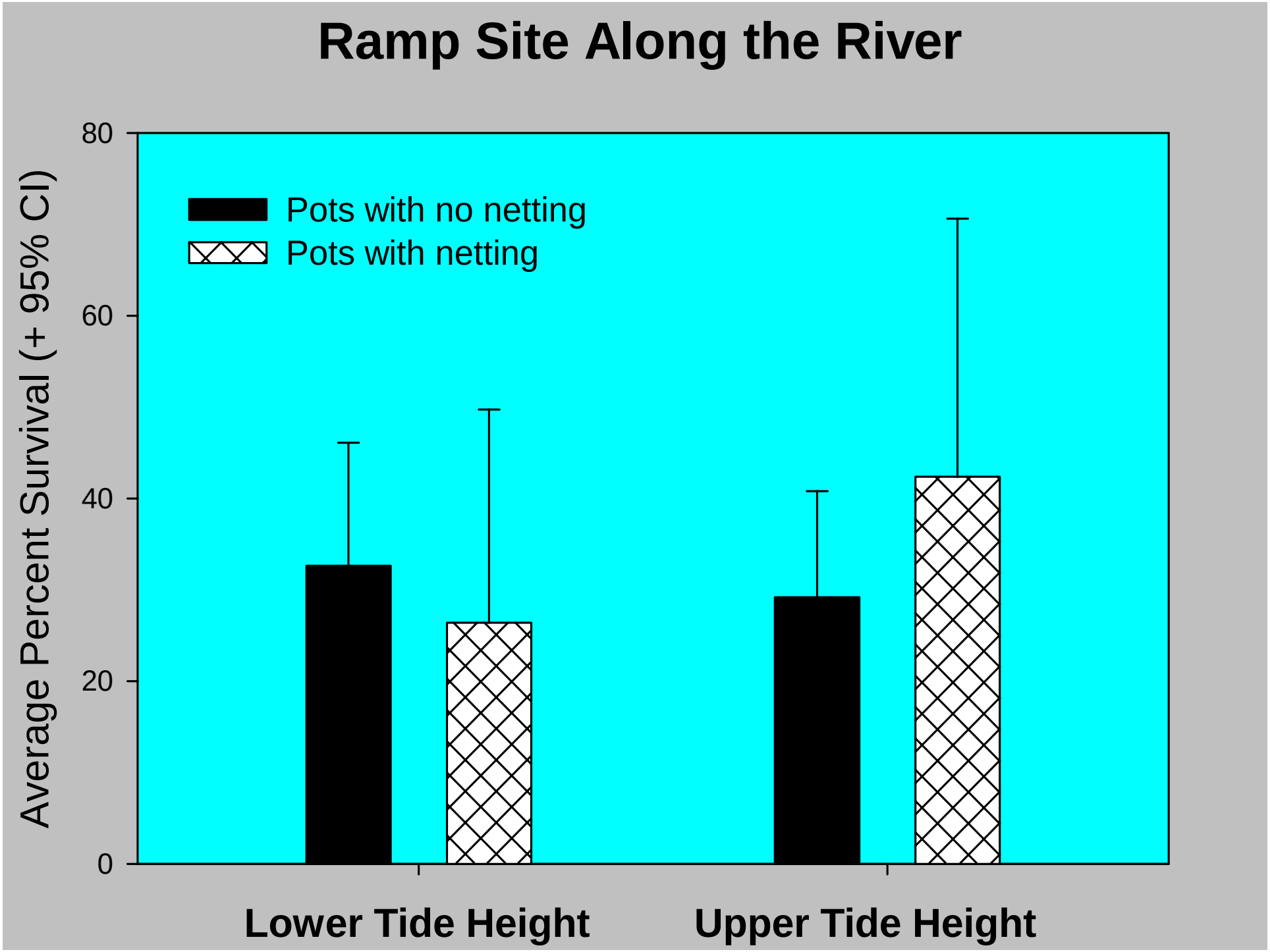
- **Average growth of clams per pot**
  (e.g., 2 mm, 5 mm, 10 mm, etc. of new shell

What information have we generated with this study?

- **Site-specific growth and survival rates for each of the three locations;**
- **The role of predators along this estuarine system;**
- **The influence of tidal height on growth and survival rate;**
- **Baseline information prior to any work on the bridge, dam, and tide gates**

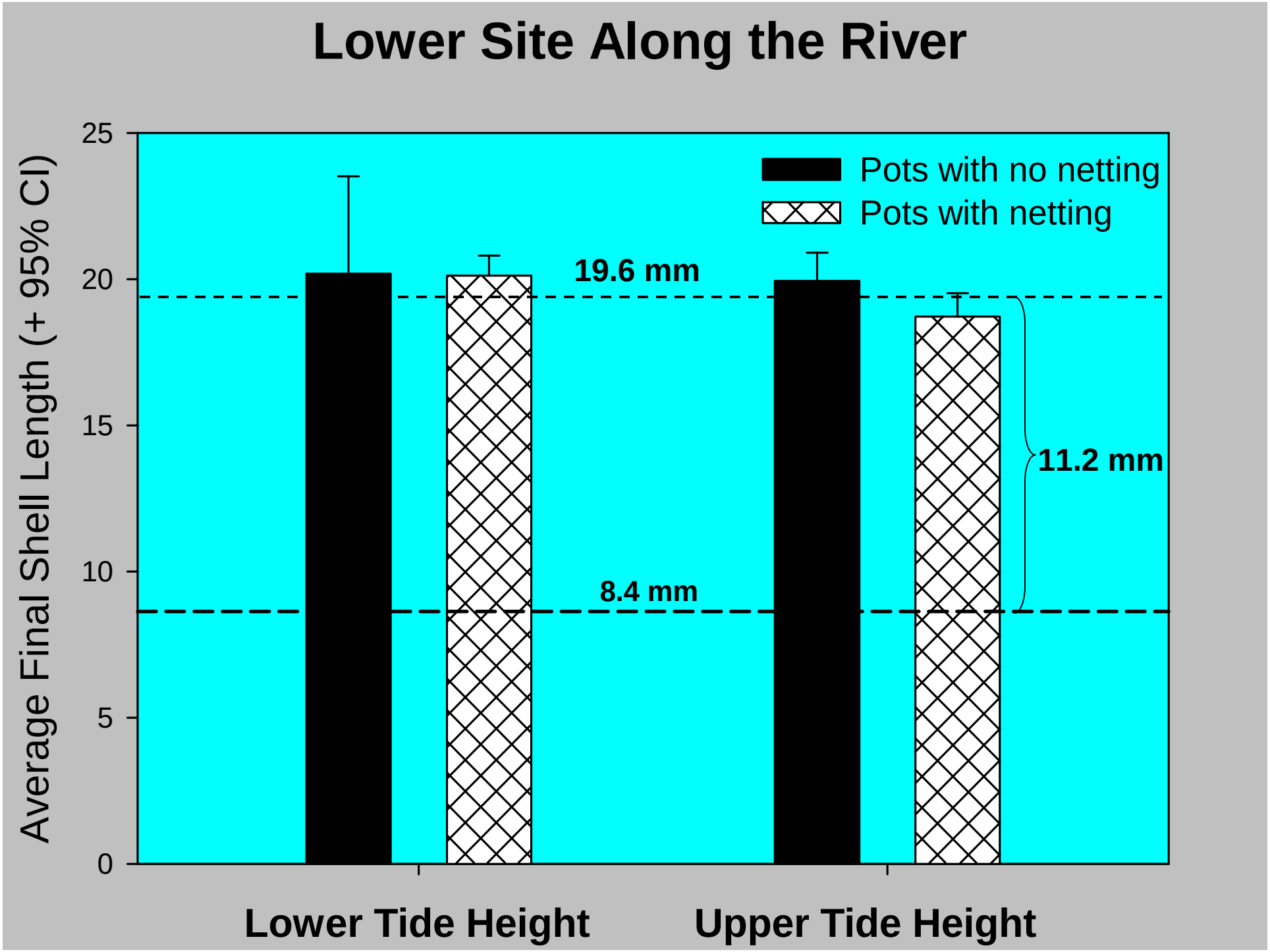

Lower Site Along the River
Average Percent Survival (+ 95% CI)
100
80
60
40
20
0
Pots with no netting
Pots with netting
Lower Tide Height
Upper Tide Height

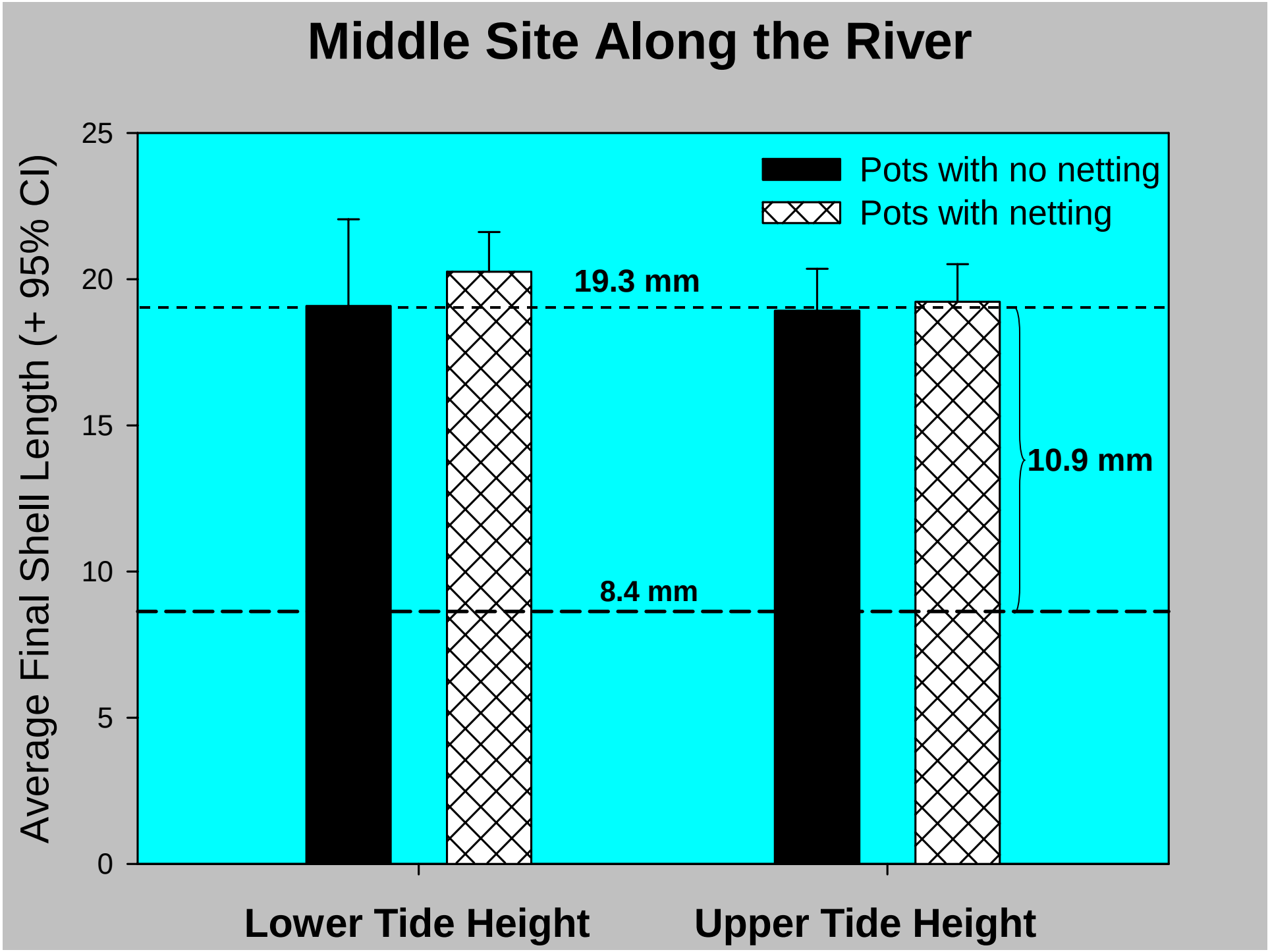

Middle Site Along the River
Average Percent Survival (+ 95% CI)
70
60
50
40
30
20
10
0
Pots with no netting
Pots with netting
Lower Tide Height
Upper Tide Height

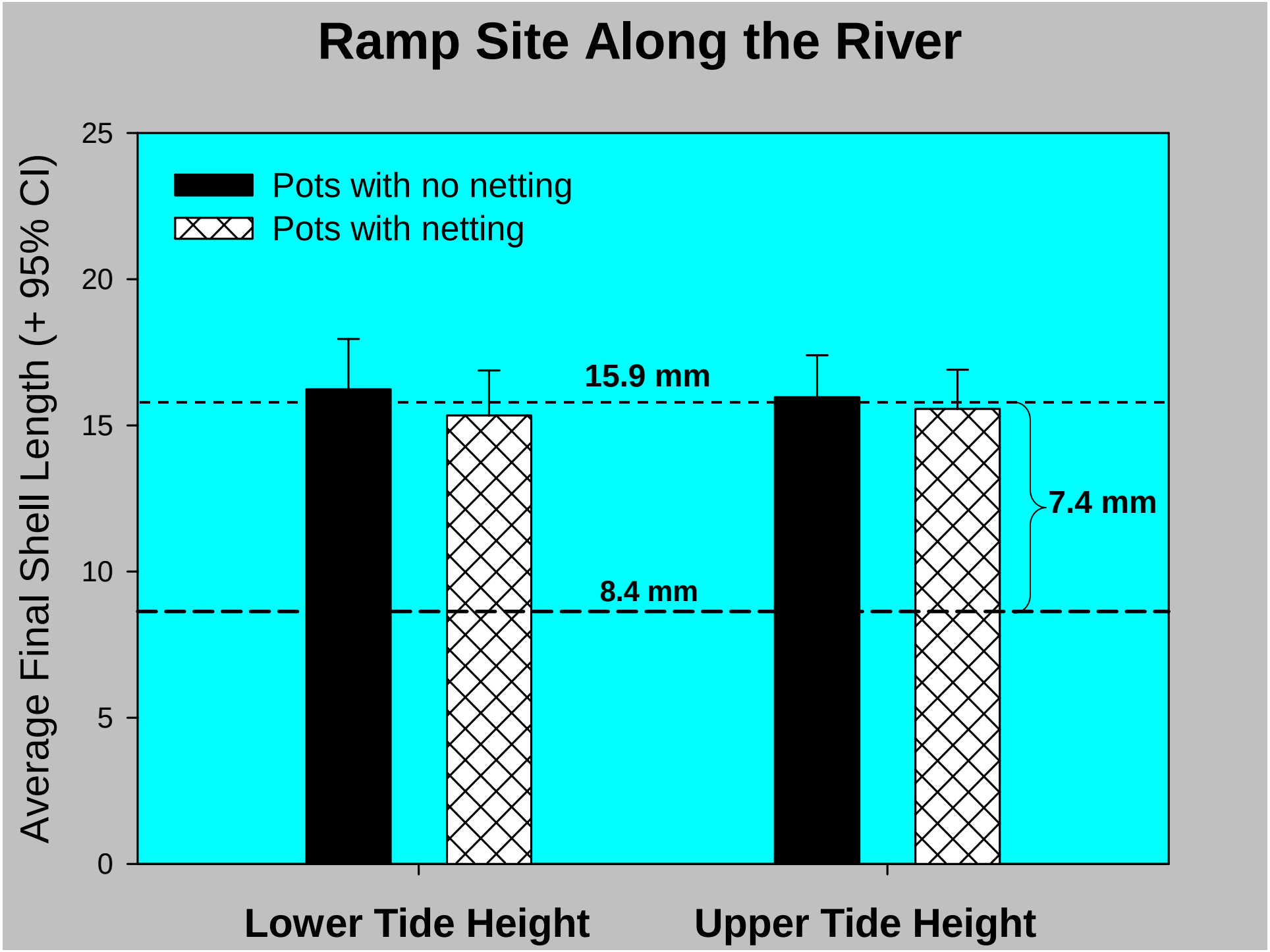

Ramp Site Along the River
Average Percent Survival (+ 95% CI)
80
60
40
20
0
Pots with no netting
Pots with netting
Lower Tide Height
Upper Tide Height

Survival Results

- **Differences in survival occurred between sites. Survival was similar between the Ramp and Lower sites with an average of only 32%, and this was higher than the Middle site with an average of 19%.**
- **The effect of tidal height was similar at the two lower sites along the river. Predation was intense at both tidal heights at these two sites. Clams survival in unnetted units was less than 10%, whereas survival in netted units was 4-7.5x higher (regardless of tidal position).**
- **Effects of predators was not the same at the Ramp site, where losses were similar in both protected and unprotected units. Predation, albeit important in reducing clam numbers at this site, was not as intense as at the other two sites.**


Lower Site Along the River
Average Final Shell Length (+ 95% CI)
25
20
15
10
5
0
Pots with no netting
Pots with netting
19.6 mm
8.4 mm
11.2 mm
Lower Tide Height
Upper Tide Height


Middle Site Along the River
Average Final Shell Length (+ 95% CI)
25
20
15
10
5
0
Pots with no netting
Pots with netting
19.3 mm
8.4 mm
10.9 mm
Lower Tide Height
Upper Tide Height


Ramp Site Along the River
Average Final Shell Length (+ 95% CI)
25
20
15
10
5
0
Pots with no netting
Pots with netting
15.9 mm
8.4 mm
7.4 mm
Lower Tide Height
Upper Tide Height

Growth Results

- Clam growth was influenced by site alone. No effect of tidal height was observed in this study, which is unusual, since clams growing lower on the shore generally grow faster than clams growing higher on the shore. Here, there was less than a 1 mm difference in final average shell length between clams growing at the upper vs. lower tidal heights at each site.

- Growth rate was 22% faster at the two lower sites along the Pleasant River than occurred at the Ramp site. Clams more than doubled (an increase of 132%) their size (putting on an average of 11.1 mm of new shell) at the two lower sites, whereas clams at the Ramp site increased in shell length by only 90%.

Thanks to all who participated in this study!