

Growth, mortality, & conservation of the Olympia oyster (*Ostrea lurida*) in a subtidal mid-bay region of Yaquina Bay, Oregon

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Why is this important?

Olympia oysters are the **only native oyster species** of the North American Pacific coast, ranging from Vancouver Island, Canada to the Baja Peninsula, Mexico.

In the United States, **more than 90% of native oyster abundances have been lost** over the last 130 years (Beck et al. 2011). Populations collapsed in the early 1900's as a result of overharvesting by European settlers.

Restoration efforts are underway in many bays along the U.S. Pacific coast. **Understanding the population dynamics of remnant subpopulations is essential in these efforts.**



Fig. 1: Olympia oysters growing on a large Pacific oyster shell. Adult Olympias are usually no more than 5cm long.

Research Questions

1. How do the three methods of shell configuration – bagged, loose, and floating lines – compare in restoration potential? What are the recruitment, growth, and mortality rates of juvenile Olympia oysters for each of these methods?
2. What is the larval output of adult Olympia oysters at the Oregon Oyster Farm?
3. Are Olympia oysters culturally important to the Confederated Tribes of Siletz Indians?

Part 1: Comparing restoration methods in terms of recruitment, growth, and mortality of juvenile Olympia oysters

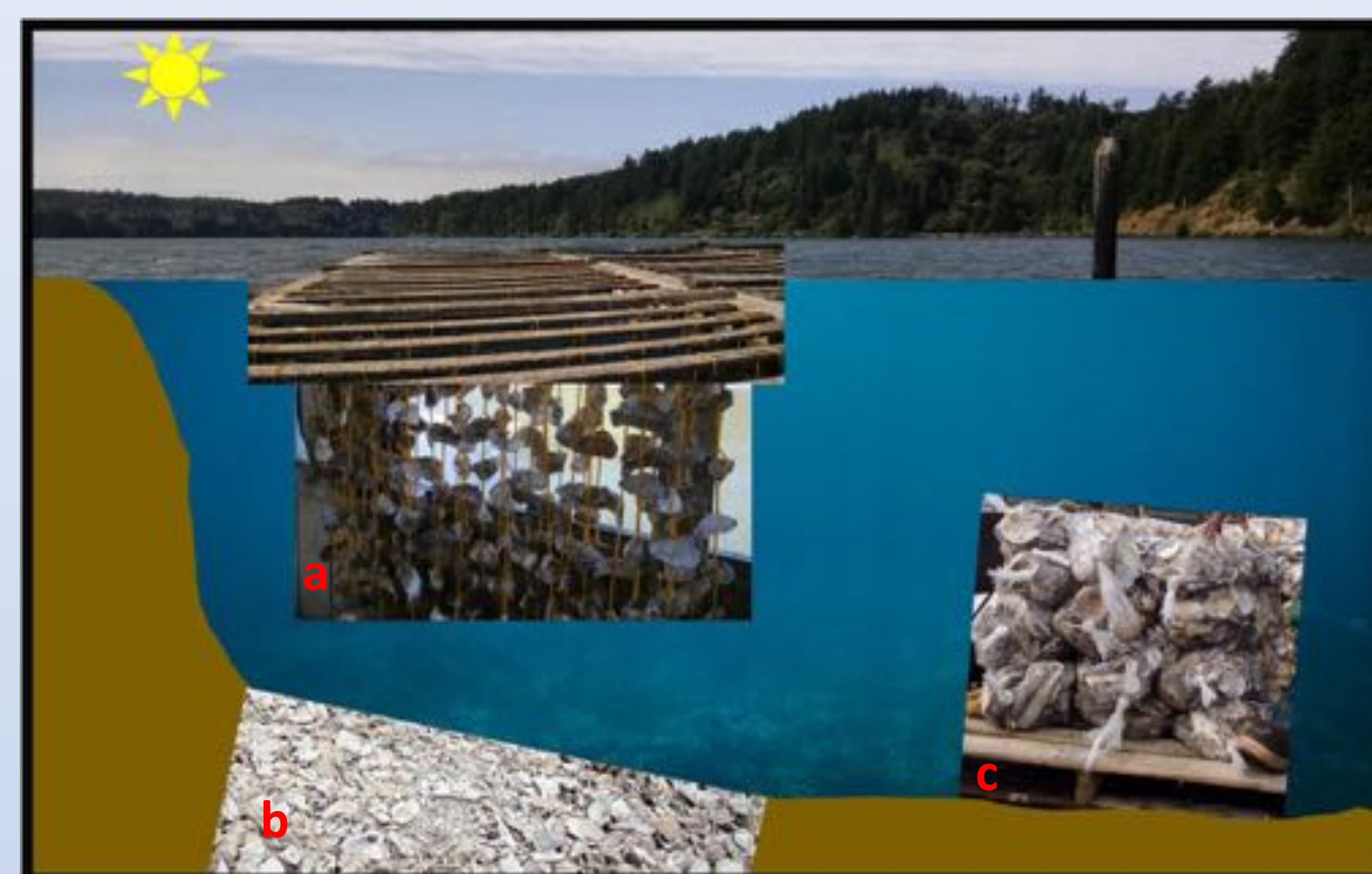


Fig. 2: (a) Lines vs. (b) Loose shells vs. (c) Bagged shells
Lines are the grow-out method for the Oregon Oyster Farm; bagged shells provide vertical relief above the muddy bottom, and are less likely than loosely distributed shells to be buried or washed away.

Part 2: Assessing fecundity of adult Olympia oysters at the Oregon Oyster Farm



Fig. 3: Olympia oysters opened in the laboratory to determine sex and stage of larval development (if any).

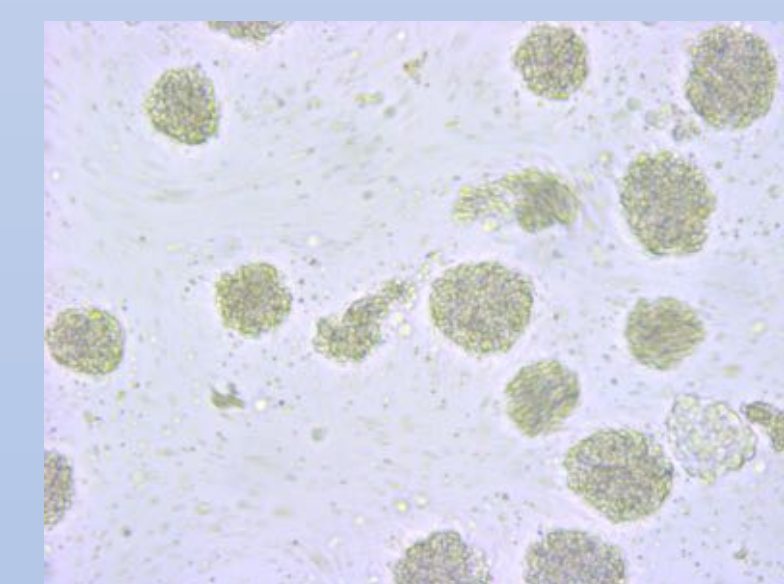


Fig. 4: Sperm balls from a male Olympia oyster. Each ball is ~250 μm in diameter, with about 2000 sperm cells in each.

Part 3: Semi-structured interviews about the cultural importance of the Olympia oyster with members of the Confederated Tribes of Siletz Indians (CTSI)

The CTSI are a confederation of 27 Native American Tribes who have traditionally lived in western Oregon and northern California. Currently, the CTSI are also conducting an Olympia oyster restoration project in Yaquina Bay. These interviews will provide cultural context to these restoration efforts.

Yaquina Bay Study Sites

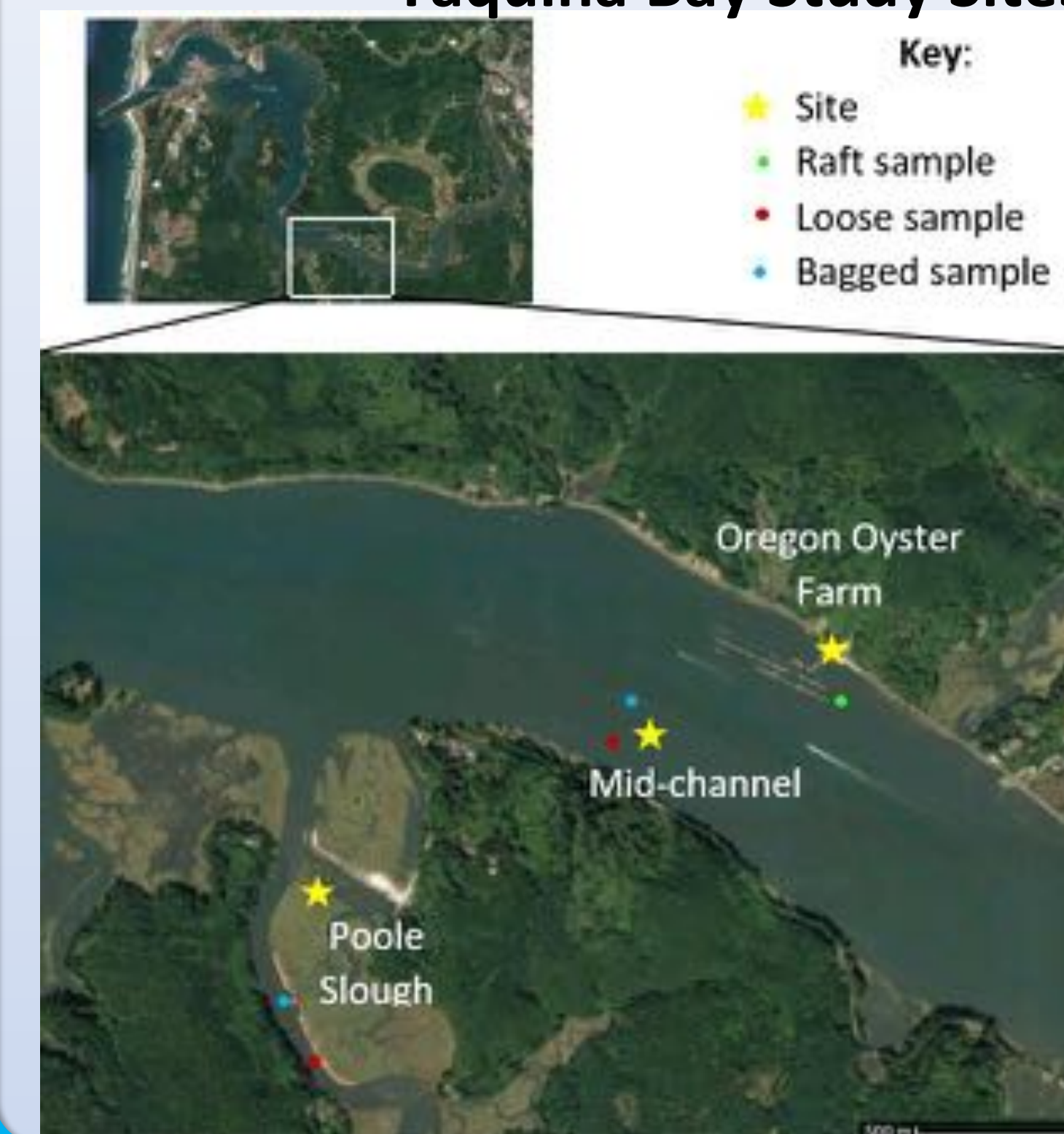
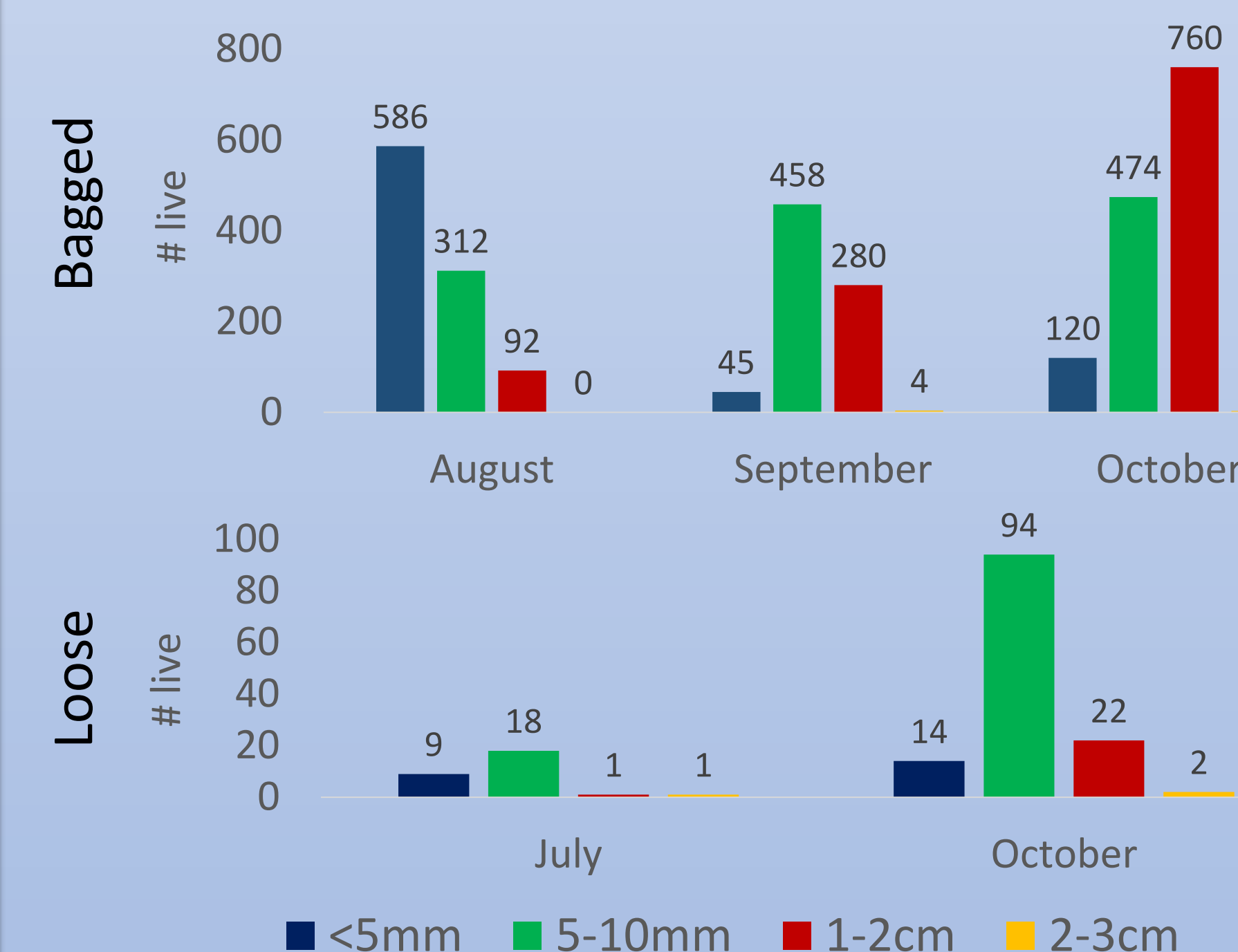


Fig. 5: Map of the three study sites in Yaquina Bay, OR: (1) at the Oregon Oyster Farm, (2) in the mid-channel, and (3) in Poole Slough

Preliminary Results

Fig. 6: Size distributions of juveniles from the midchannel sites



- **Growth rates:** Takes about 3 months for juveniles to reach a shell height of 1 cm.
- **Recruitment rate** at bagged midchannel site ~10x greater than at loose midchannel site.
- **Mortality rates** are currently low (~20%), but may increase as rainy season progresses

References:

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- Beck, M. W., Brumbaugh, R. D., Airoidi, L., Carranza A., Coen, L. D., Crawford, C., Defeo, O., Edgar, G. J., Hancock, B., Kay, M. C., Lenihan, H. S., Luckenbach, M. W., Toropova, C. L., Zhang, G., Guo, X. (2011). Oyster Reefs at Risk and Recommendations for Conservation, Restoration, and Management. *BioScience* 61(2): 107-16.