

Oyster Gardening and Climate Change

GLOBE Learning 2 Research Project

Ray Yoh and Cheryl Rowlands

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QUESTION: How will gradual climate change impact oysters in the Chesapeake Bay Watershed?

HYPOTHESIS: If temperatures rise due to an increase in carbon dioxide in the air, then water quality will decline and oyster growth will be impeded.

EXPERIMENT: Compare growth of oysters placed in different bodies of water with different water qualities.

In September, 2011, approximately 8,000 oyster spat were placed in Taylor Floats in four different Chesapeake Bay tributaries. All oyster spat came from the same source, Oyster Reefkeepers of Virginia. One float was located at LeeWard Marina in the James River in Newport News, VA. The second float was located in the Back River, a tributary of the York River, in Poquoson, Virginia. Float number three was placed in Hoffer Creek, a tributary of the James River, in Portsmouth, Virginia. The fourth float was placed in Oyster Harbor on the Eastern Shore of Virginia. Each float held approximately 2,000 oyster spat. Floats one and three were both located in rather large urban areas. (*See Attachment B, *Map Displaying Oyster Float Locations*)

Each month groups of students visited the floats to collect water quality data and measured the length of the oysters. Data collected at each site included dissolved oxygen, pH level, salinity (in ppt), water temperature, length of 50 random oysters, and mortality rate. (*Note: Northampton High School and Christopher Academy did not have materials to test for DO*)

RESULTS: Results and comparisons of data collected are displayed in the attached graphs. (Attachments C – E)

CONCLUSION: No actual conclusions can be drawn. However, a few observations can be made:

- More growth was shown in water with moderate salinity and acidity.
- Growth is better as dissolved oxygen increases.

Throughout the seven months of data collection and observations several sources of error in our experiment were noted:

- Measurements at each site were not taken on the same day.
- Water turbidity was not considered.
- Water depth was not constant.
- Tides were not considered.
- Water flow rates were not considered.
- Water and air temperatures were not consistently included in data collection.
- Water and air temperatures were not always accurate.
- Mortality rate was not closely tracked at all locations.

NEXT STEPS: It was not long into this experiment that we realized that one year's worth of data would not be sufficient to draw conclusions. This set of data should be used as a baseline for comparison only and the experiment should continue through next year, and ideally for several years. Secondly, when considering the sources of error, placing multiple oyster floats in the same place, (i.e. Leeward Marina), will provide valid data for comparison.

Attachment A, Participants:

Trinity Lutheran School, Newport News, Virginia

Mr. Ray Yoh (7th and 8th Grade Science Teacher)

Mrs. Cheryl Rowlands (6th and 7th Grade Science/Math Teacher)

Sixth Grade Students

Nathan Bagley
Parker Bird
Josh Brown
Jasmin Caldwell
Will Candella
Michael Christou
Ian Cullen
Henry Eley
Jonathan Gray
Timothy Horswill
Elijah Jones
Taylor Kagie
Nicole McBride-Glascock
Jack Miller
Sasha Roberts
Paige Robinson
Julian Ruiz
Garrett Satchell
Victoria Schatzel

Seventh Grade Students

Zach Abdullah
Cate Bradberry
James Burton
Abigail Carney
Camden Carpenter
Piper Carpenter
Savannah Cook
Andres Daniel
Bradley Duguay
Audre'ana Ellis
Lulu Elzein
Lora Fara
Lane Faulkner
Cameron Frazier
Michael Fremaux
Wilson Hatchett
GuruBandaa Khalso
Athena Krafft
Benjamin Mitchell
Jason Nicolai
Kirk Ring
Charlie Ruble
Caleb Townsend
Devon Trepp
Ian Wildemann
Benjamin Woessner

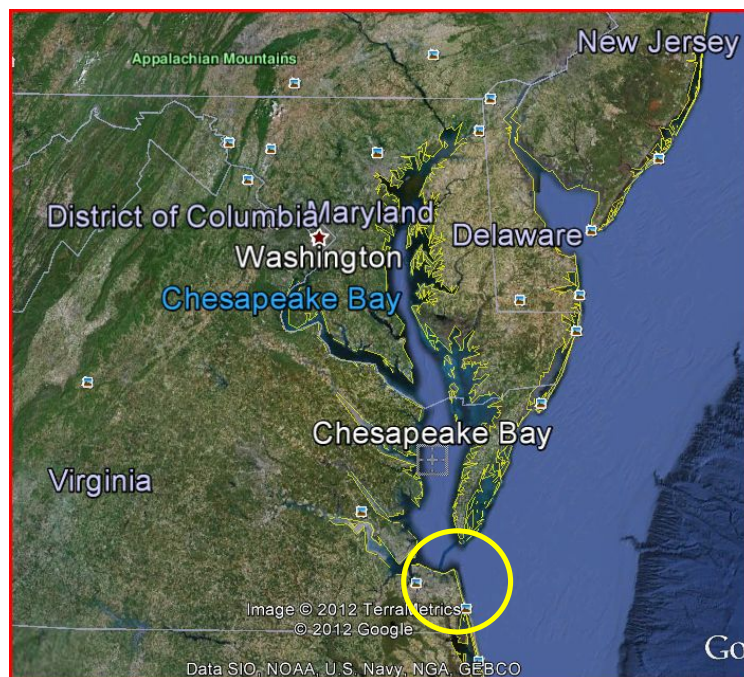
Christopher Academy, Portsmouth, VA

Mrs. Miriam Terry (4th and 5th Grade Math/Science)

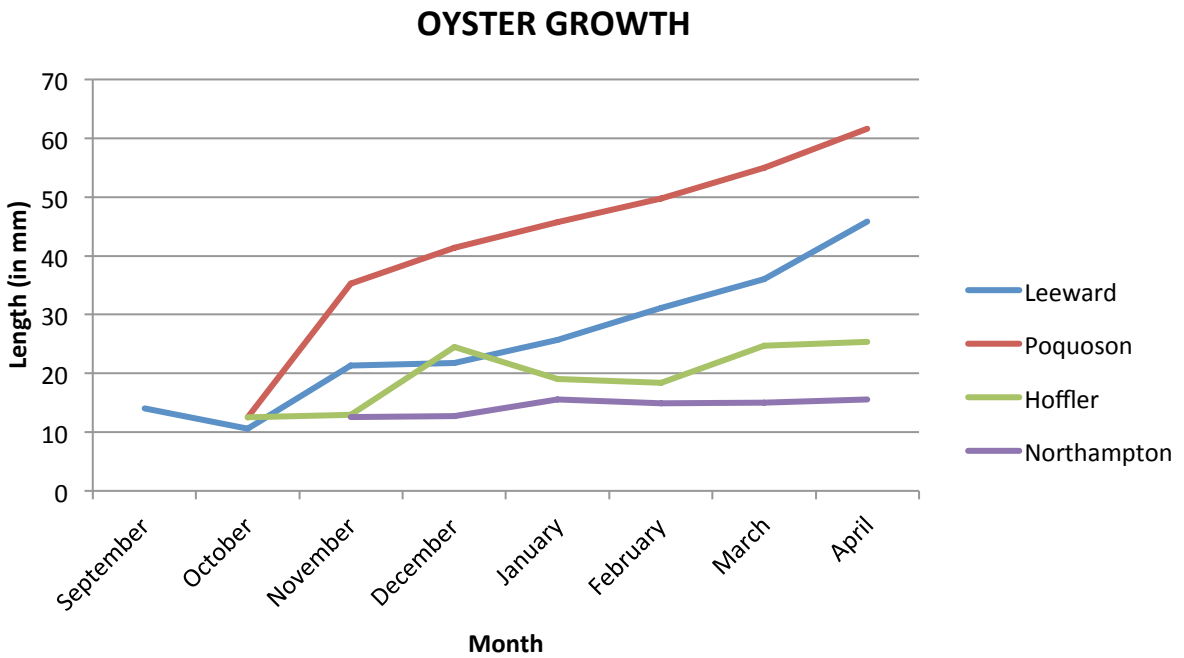
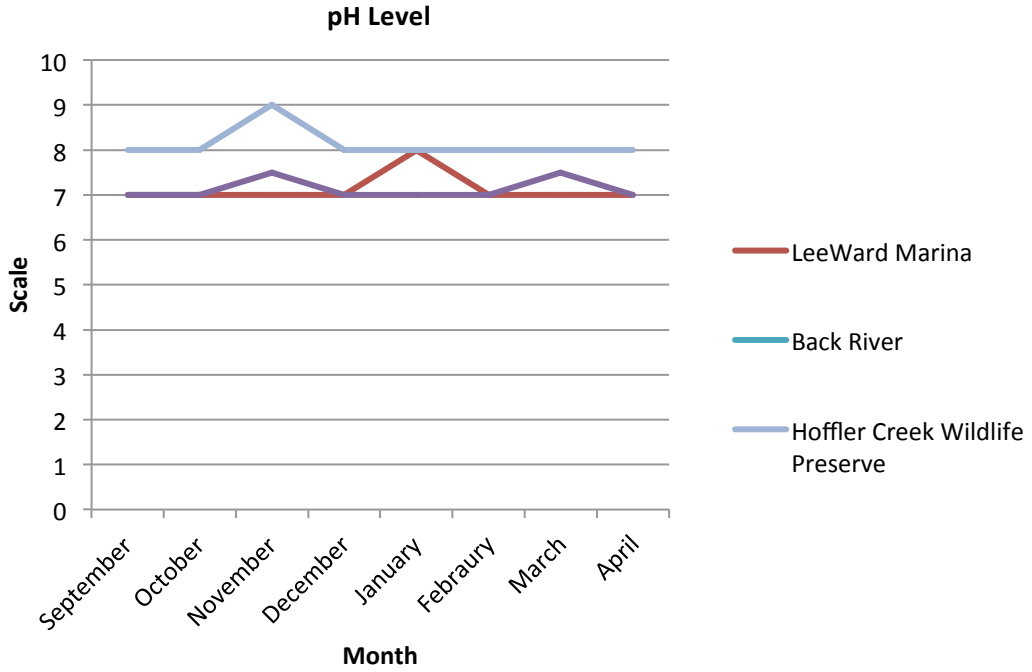
Northampton High School, Northampton, VA

Mrs. Sally Richardson (Biology, 10-12)

Attachment B
Map Displaying Oyster Float Locations

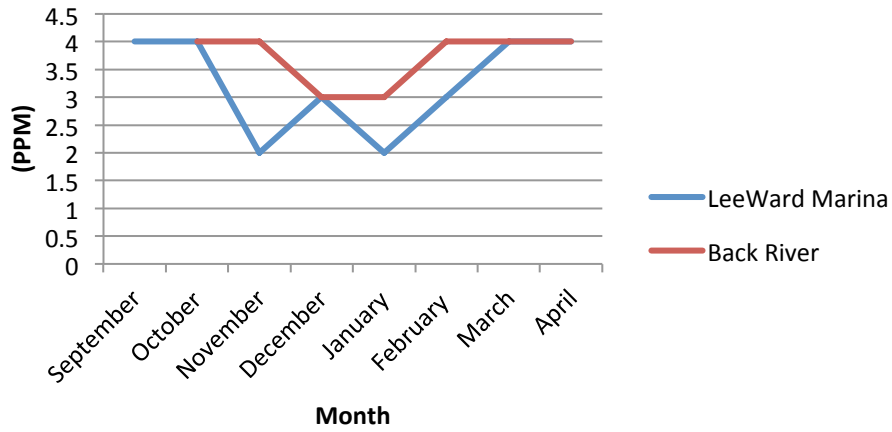


Attachment C
Comparison of pH Levels and Oyster Growth

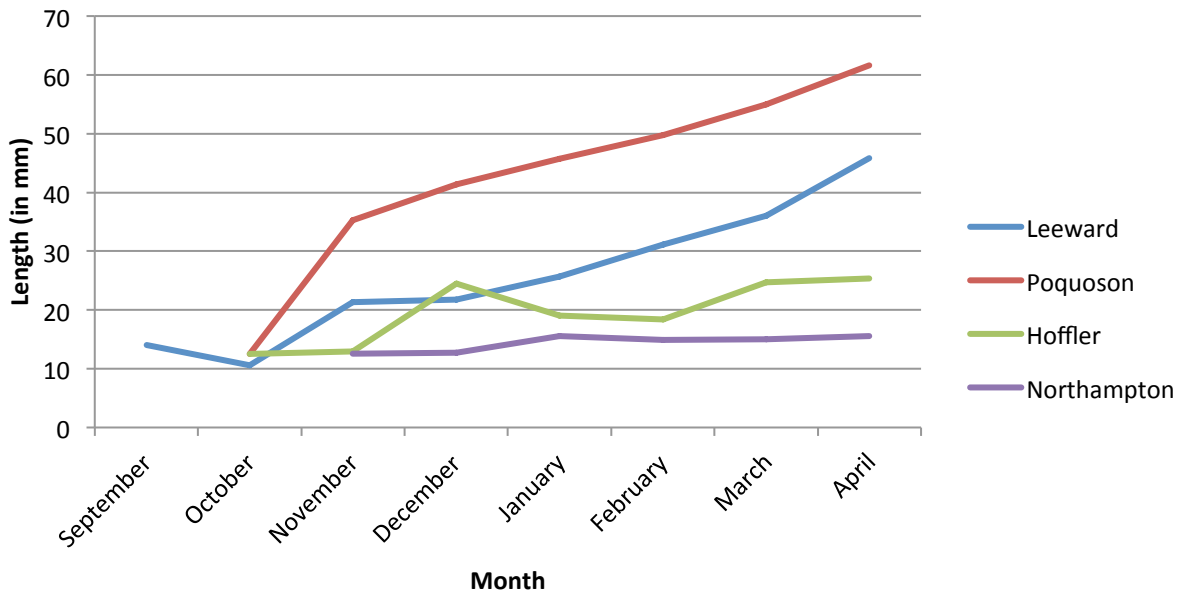


Attachment D
Comparison of Dissolved Oxygen Levels and Oyster Growth

DISSOLVED OXYGEN



OYSTER GROWTH



Attachment E
Comparison of Salinity levels and Oyster Growth

