



# What's Happening to the Oysters?

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Fisheries management, fish movement ecology, marine protected areas, kelp forest ecology, and ocean acidification.

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## Because of our ORSEA Partnership

An excellent opportunity to share relevant research with middle school teachers and work together to develop an engaging curriculum with hands on activities.

Developing a middle school curriculum for such a complex topic was a great way to develop science communication skills! We hope that introducing this topic with a hands on approach will establish a foundation of interest, exploration, and understanding.

Though it has been a difficult and unique school year, this unit is now created and in place to teach in the future, and we anticipate the addition of field trips then.

The topic has a clear connection to [Outdoor School](#) and [Watershed](#) programming, as well as other units on chemical and physical changes.

Additional connections may be made with biological units, in consideration of the effects of chemical changes to the ocean on marine organisms. This is at the forefront of current research, with new findings emerging continuously.



Students on the Southern Oregon Coast grow up in a community reliant on the ocean, but how can we help them prepare to understand and adapt to a changing ocean? We need to support our students in understanding the relationship between what we do on land, how it affects ocean chemistry, biology, and ultimately the physical, social, and economic well-being of our coastal communities. Improving our understanding of carbon chemistry of the oceans and its effects on ocean acidification is essential to our students' ability to grasp these relationships.



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Excess CO<sub>2</sub> from burning fossil fuels builds up in the atmosphere and dissolves in the ocean, resulting in increased acidity. This affects shell-building organisms like oysters, especially in early life stages. We need to continue to study adult oysters to learn more.

## Learning Plan

This unit uses current data and knowledge of the carbon cycle to help students understand ocean acidification and take action in their community. We aim to help students answer questions about chemical changes while also equipping them to be stewards of the ocean.

Lessons in this unit will follow the 5E model, helping students engage, explore, explain, elaborate, and evaluate the following enduring understandings and essential questions.

### Essential Questions:

- How do we know chemical changes are happening?
- How do humans and natural ecosystems rely on each other for survival?
- How is the ocean changing and what can we do about it?
- What role can humans take in protecting ocean chemistry and ocean ecosystems?

### Enduring Understandings:

- Marine ecosystems and the humans who rely on them are interconnected.
- Human actions lead to changes in ecosystems.
- Changes in one portion of a system can lead to multiple changes in the rest of the system.
- Individual and collective actions are needed to effectively manage resources for all.

## Link to Lesson Plan



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