

Science Time Special Edition

Sea Change – Main A1, Tuesday 9-17-13

Article 3: Oysters dying as coast is hit hard

Pre-reading and vocabulary: Define and use the following terms in a sentence.

nonnative

spawn

hatchery

tidal flat

corrosive

### Introduction

1. Why did the Nisbet oyster family move their shellfish hatchery from Seattle to Hawaii?
2. Number of miles the Nisbet family moved their operation.
3. What is the relationship between the pH in Northwest ocean water and oyster deaths?
4. What actions have people taken since oyster deaths started occurring over the past few years?

### Shellfish “pretty much all we have”

5. Describe the role shellfish have played in the lives of people in the Northwest and how it has changed over time.
6. The shellfish industry near Puget sound employ \_\_\_\_\_ people and produces \_\_\_\_\_ % of the nation’s oysters.

### Dramatic Crash

7. Why did shellfish farmers begin to panic in Willapa Bay around the year 2007?
8. How were shellfish farmers able to rule out bacteria as the cause of shellfish deaths in 2008?
9. Pacific oysters farmed in Willapa Bay originally come from \_\_\_\_\_ and arrived to Northwest waters during the \_\_\_\_\_.

### Corrosive waters rise to surface

10. Why was it surprising to recently see corrosive water close to the surface off of Northern California?
11. What solution helped shellfish farming get back on track?
12. Why are young shellfish so heavily impacted by corrosive water?

### Small fixes, big worries

13. List 3 actions being taken to protect oyster larvae.

#### Prompts and Extensions

1. Watch a video about the Nisbet family's business, see how oysters are farmed, and learn more about their drastic action plan.  
<http://oceanacidification.noaa.gov/AreasofFocus/AdaptationStrategies.aspx>
2. Watch how oysters are shucked for eating.  
<http://www.howcast.com/videos/95486-How-to-Shuck-an-Oyster>
3. Read about what a New York City school is doing to bring oysters back New York harbor, a place oysters once thrived. Next, brainstorm ways that you can help ensure the survival and protection of oysters in your community.  
<http://www.nytimes.com/2010/06/30/dining/30harbor.html?pagewanted=all>
4. This three-part special edition of the science time ends with an oyster farmer calling for a widespread education campaign. Now that you've learned there is a problem, it's time for you to take action. Learn about ways in which you can help reduce your carbon footprint <http://www.c40cities.org/takeaction/1> and reduce ocean acidification.

# Science Time

## Special Edition

### ANSWERS

#### Introduction

1. Why did the Nisbet oyster family move their shellfish hatchery from Seattle to Hawaii? **Ocean acidification.**
2. Number of miles the Nisbet family moved their operation. **3000 miles**
3. What is the relationship between the pH in Northwest ocean water and oyster deaths? **As pH decreases in Northwest oceans oyster deaths increase.**
4. What actions have people taken since oyster deaths started occurring over the past few years? **Oystermen have testified before Congress and spoken at science conferences; Journalists from around the world have visited the Northwest tidelands; Washington Gov. Chris Gregoire established a task force of ocean acidification experts.**

#### Shellfish “pretty much all we have”

5. Describe the role shellfish have played in the lives of people in the Northwest and how it has changed over time. **Thousands of years ago Native Americans relied on shellfish... shellfish were then overfished by settlers during the Gold Rush... farmers started raising shellfish (bivalves) like crops**
6. The shellfish industry near Puget sound employ \_\_\_\_\_ people and produces \_\_\_\_\_ % of the nation’s oysters. **3,200; 25%**

#### Dramatic Crash

7. Why did shellfish farmers begin to panic in Willapa Bay around the year 2007? **No young oysters were surviving in the bay; no oyster reproduction was occurring.**
8. How were shellfish farmers able to rule out bacteria as the cause of shellfish deaths in 2008? **Shellfish continued to die when the bacteria *Vibrio tubiashii* was not present in the water.**
9. Pacific oysters farmed in Willapa Bay originally come from \_\_\_\_\_ and arrived to Northwest waters during the \_\_\_\_\_. **Japan; 1920s**

#### Corrosive waters rise to surface

10. Why was it surprising to recently see corrosive water close to the surface off of Northern California? **Waters containing a low pH (corrosive) were not expected to be at the surface for another 50 to 100 years.**
11. What solution helped shellfish farming get back on track? **Hatcheries only took water in when it had normal pH levels.**

12. Why are young shellfish so heavily impacted by corrosive water? **It causes them to use too much energy to build their shells.**

Small fixes, big worries

13. List 3 actions being taken to protect oyster larvae. **Hatcheries are changing the timing of when they draw in water; scientists are monitoring ocean water; growers are crushing up shells and adding chemicals to the water; shellfish geneticists are working to breed new strains of oysters resistant to low pH water**