

## Lobster Larval Recruitment

A Classroom Activity for Ocean Gazing Episode #8: The glide of a lifetime: Part II

**Grade Level:** 6-12

**Lesson Time:** 45 min.

### Materials Required

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- ✓ computers with internet access
- ✓ copies of the student worksheet
- ✓ map of coastal area of interest

### Summary

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Scientists collect several types of data and input the data into models to predict the future behavior of a system, in this case lobster population in the Gulf of Maine.

### Objectives

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- ✓ Determine factors necessary for successful lobster maturation.
- ✓ Interpret real-time data to predict areas where lobster larvae may thrive.

### Vocabulary

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Data models, real time data, ocean forecasting, currents, *Homarus americanus*, larvae

### Introduction

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The American lobster, *Homarus americanus*, has a complex life history (see the Lobster Conservancy Life Cycle Chart at <http://www.lobsters.org/research/research.html>) that ranges from free-floating

planktonic larvae to large bodied bottom-dweller. Larval and post-larval lobsters can drift in the water column for a couple of months before settling on the bottom. Once they do settle, they find shelter in beds of cobbles and boulders until they are large enough to defend themselves.

To understand lobster recruitment processes (how they survive to grow into adulthood), it is important to know where the larvae and postlarvae are coming from, how they are transported to the inshore recruitment habitats, and how the various larval stages are distributed in the water column. Current scientific research in this field involves sampling lobster larvae at various depth levels and then, using circulation models, determining how the vertical distribution of larvae interacts with circulation to affect transport rates and patterns. Information collected through these studies will contribute to ongoing lobster recruitment studies that could be used ultimately to help manage the fishery. For more background, visit Understanding the Lobster Fishery at

<http://www.lobsterconservation.com/thelobsterfishery/>.

### Data Activity

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In this activity students will use ocean circulation models and real time data to predict where lobster larvae will settle.



1. Play with the Hatch to Catch simulation from Bigelow Lab in the Gulf of Maine.  
[http://www.bigelow.org/hatch\\_to\\_catch/](http://www.bigelow.org/hatch_to_catch/)
2. Consider the four major influences on lobster larvae surviving to maturity including currents, depth, temperature, and bottom type.
3. Use the real-time data links listed below to determine an optimal location for American lobster larvae to settle:

#### *Sea Surface Temperature Data*

- Gulf of Maine  
[http://marine.rutgers.edu/cool/sat\\_data/?nothumbs=0&product=sst&region=maine](http://marine.rutgers.edu/cool/sat_data/?nothumbs=0&product=sst&region=maine)  
<http://www.gomoos.org/buoy/satellite.html>
- Coastal New Jersey  
[http://www.thecoolroom.org/boaters/boat\\_sst.htm](http://www.thecoolroom.org/boaters/boat_sst.htm)
- Chesapeake Bay  
[http://marine.rutgers.edu/cool/sat\\_data/?product=sst&region=chess&nothumbs=0](http://marine.rutgers.edu/cool/sat_data/?product=sst&region=chess&nothumbs=0)

#### *CODAR*

- Gulf of Maine  
<http://www.gomoos.org/codar/>
- Coastal New Jersey  
[http://www.thecoolroom.org/boaters/boat\\_codar.htm](http://www.thecoolroom.org/boaters/boat_codar.htm)
- Altimetry Data  
[https://www.fnmoc.navy.mil/products/WAM/natl\\_swht\\_000.gif](https://www.fnmoc.navy.mil/products/WAM/natl_swht_000.gif)
- Gulf of Maine  
<http://www.gomoos.org/waveforecasts/>

#### *Coastal Breezes*

- Coastal New Jersey  
[http://www.thecoolroom.org/boaters/boat\\_met.htm](http://www.thecoolroom.org/boaters/boat_met.htm)

- Chesapeake Bay  
<http://www.cbos.org/>
4. Have students consider the following questions:
    - Is there currently an area in the Gulf of Maine that would be considered an optimal location for American lobster larvae?
    - Would the coastal waters off New Jersey be considered an optimal location for American lobster larvae? Explain.
    - Would the Chesapeake Bay be considered an optimal location for American lobster larvae? Explain.
    - How would you find out what the substrate is in these areas?
    - How might coastal breezes have an impact on optimal locations for lobster larvae?
    - How might real-time data and computer modeling help manage the lobster fishery?
  5. For additional information, direct students to “Ask the Lobster Doc” at <http://www.lobsters.org/ldoc/ldocindex.html>, Also “Adopt-A-Lobster” at <http://www.lobsters.org/>

#### **Extension**

Other species of lobster all over the world are being studied using similar methods. Explore the following information and use real-time data to determine optimal locations for the larvae.

#### *Spiny Lobsters*

<http://sealevel.jpl.nasa.gov/science/lobster.html>

#### *Florida Sea Surface Temperature*

[http://marine.rutgers.edu/cool/sat\\_data/?nothumbs=0&product=sst&region=floridacoast](http://marine.rutgers.edu/cool/sat_data/?nothumbs=0&product=sst&region=floridacoast)

*Florida Altimetry Data*

[https://www.fnmoc.navy.mil/products/WAM/natl\\_swht\\_000.gif](https://www.fnmoc.navy.mil/products/WAM/natl_swht_000.gif)

*Australian Rock Lobster*

<http://www.frdc.com.au/pub/reports/files/97-139.htm>

<http://iri.columbia.edu/climate/ENSO/societal/example/Griffin.html>

<http://www.csiro.au/index.asp?type=mediaRelease&id=PrRocklobster>

<http://www.fish.wa.gov.au/comm/broc/lobster/lobcmgy.html>

*Australian RTD*

<http://www.aodc.gov.au/>

**National Science Standards**

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**Science as Inquiry**

Abilities necessary to do scientific inquiry  
(K-4, 5-8, 9-12)

**Physical Science**

Motion and forces (5-8, 9-12)

**Life Science**

Regulation and behavior (5-8)  
Populations and ecosystems (5-8)  
Behavior of organisms (9-12)

**Science and Technology**

Understanding about science and  
technology (5-8, 9-12)

**Science in Personal and Social  
Perspectives**

Science and Technology in Society (5-8, 9-12)

**Ocean Gazing Podcast**

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The related podcast episode for this activity can be found by going to the podcast section of [www.oceangazing.org](http://www.oceangazing.org)