

# NOAA Treasure Hunt!

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This series of lessons was developed by the Maine Mathematics & Science Alliance and a group of Maine, Massachusetts, and New Hampshire middle school science teachers with funding from NOAA Environmental Literacy Grant NA07SEC4690002. For more information about the Earth as a System is Essential: Seasons and the Seas (EaSiE) project, visit [www.mmsa.org/easie](http://www.mmsa.org/easie)

## NOAA TREASURE HUNT!

**Overview:** The overarching goal of *Earth as a System is Essential: Seasons and the Seas* (EaSiE) is to transform the traditional middle school study of terrestrial seasons and weather into an exploration of the dynamic interactions between Earth's land, water, atmosphere, and the living world. Many of the EaSiE lessons have students work with and make meaning from Gulf of Maine buoy and satellite data.

The purpose of the Treasure Hunt is to provide an opportunity for students to explore several NOAA-affiliated websites that will be used in the subsequent study of weather and climate, and introduce students to some of the physical features of the Gulf of Maine.

### **Materials, equipment and supplies (1 for each team):**

- Computer with online access
- Treasure hunt cards (Appendix A; copy on colored paper and cut into cards)
- Treasure hunt map of the Gulf of Maine\*
- Small shell for place marker
- Recording sheet (Appendix B; you may choose to distribute 1 to each student)

For the teacher:

- Treasure hunt answer key (Appendix C)

\* Note: This lesson was designed using the 10"x12" *Ocean Observing in the Gulf of Maine Fixed Observing Stations* map as the game board, provided by the Gulf of Maine Ocean Observing System (GoMOOS) Buoy Program: [www.gomoos.org](http://www.gomoos.org).

If other Gulf of Maine maps are used as the game board, the buoy stations can be added using small round stickers. Buoy station locations are available at: <http://www.gomoos.org/aboutgulfme/>

**Time Required:** 60+ minutes

## Teaching the Lesson:

### Engage:

Play the Gilligan's Island TV theme song:  
<http://www.televisiontunes.com/Gilligan>

The S.S. Minnow is in need of guidance during their tour of the Gulf of Maine. Help the Skipper, Gilligan, and the rest of the crew as they navigate the Gulf of Maine; here's hoping they have a more successful '3 hour tour' than the one they had in the 1960's!

### Explore:

1. Distribute the maps, cards, place markers, recording sheets.
2. Have teams place their marker on Great Bay in New Hampshire.
3. The goal is for each team to explore the NOAA websites and the Gulf of Maine by answering the question on each of the 10 cards and moving the place marker around the Gulf of Maine buoy map.
4. Remind students that they should not proceed to the next card until they have recorded answers on their recording sheet.

### Discuss/Reflect:

After all groups have completed the Treasure Hunt, ask:

- What were some of your favorite sites - and why?
- What's something you now know about the Gulf of Maine that you didn't know before the Treasure Hunt?
- What's a new question you now have?

## Appendix A Treasure Hunt Cards

**Treasure #1:** The Minnow crew is meeting at the Wells Reserve in Wells, Maine.

Go to the Wells Reserve website at [www.wellsreserve.org](http://www.wellsreserve.org) and find three useful resources that are available to them on this website. Why are these useful resources? Record your information on your answer sheet. Move your place marker to the Wells Reserve on your map.

**Treasure #2:** Skipper was amazed at what he saw on the computers at the Ecology Center at Wells Reserve! The Wells Reserve uses information from the Centralized Data Management Office (CDMO). To help Skipper learn more about this data management site, go to <http://cdmo.baruch.sc.edu/> and click on the “About CDMO” link. Write two sentences explaining the purposes of “CDMO” and “SWMP”.

**Treasure ##3:** The Minnow is now ready to head north to Casco Bay, which is just east of Portland. The Professor was wondering what type of clothing to bring along.

The weather in Portland and Wells is pretty similar. Go back to the Wells Reserve CDMO site, <http://cdmo.baruch.sc.edu/> and find the “real time” air temperature at Wells so Skipper can inform the crew what they need to wear. Record the “real time” weather conditions, and move your marker to Casco Bay on your map.

**Treasure #4:** The wind has picked up and Ginger is worried about her hair! Skipper is also wondering about the wind.

Using the GoMOOS website, [www.gomoos.org/data/recent.html](http://www.gomoos.org/data/recent.html) find the buoy southeast of Wells and get the latest update on wind speed and direction. Record the buoy identification letter, the wind speed, and wind direction information on your answer sheet. Then move your place marker to the corresponding buoy on your map.

**Treasure #5:** Mary Ann loves to scuba dive and thought she might be able to see some Maine aquatic life if she got some diving in. She was wondering how cold the water in Jordan Basin would be.

Go to the GoMOOS website: [www.gomoos.org](http://www.gomoos.org) and click on the “Real-Time Data” section. Find the GoMOOS buoy located in the Jordan Basin. Record the Buoy identification letter and the latest water temperature reading in Jordan Basin. Then move your place marker to the corresponding buoy on your map.

**Treasure #6:** The Minnow heads southwest to Georges Bank. Lovey says she is nervous about traveling out that far. She thinks the water will be very deep.

On your data table list your predictions of water depth of each buoy listed. Then go back to the GoMOOS “Real-Time Data” page:

[www.gomoos.org/data/recent.html](http://www.gomoos.org/data/recent.html)

Click on each buoy, and then use the “Station Description” link to find the name of the buoy location and actual depth at each of the buoys. Then move your place marker to the buoy found at Georges Bank.

**Treasure #7:** After stopping on Nantucket Island for lunch, the Minnow crew heads northwest to the UNH campus. It's been a great "3-hour tour!" When they get to UNH, the Professor introduces the crew to Professor Wake, who tells them about the AIRMAP program. Visit the AIRMAP website at: <http://airmap.unh.edu/> and write two sentences about what AIRMAP is and what kind of data can be obtained from this site. Move your place marker to the UNH campus.

**Treasure #8:** There are some important organizations make our *Earth as a System is Essential: Seasons and the Seas* (EaSiE) lessons possible. They are our NOAA partners.

Let's see who the EaSiE partners are by going to the EaSiE website at <http://mmsa.org/easie/> Click on the "Program Partners" link. Take a few minutes to look at our partners' web pages.

Explore the EaSiE partner website, **National Weather Service, Gray Maine** to find out the weather for the next 3 days for your region. Record this information on your answer sheet.

You did it -you are now familiar with several NOAA resources and the Gulf of Maine!

## TREASURE HUNT!

Name: \_\_\_\_\_

Directions: Use the cards to locate the websites and to answer the following questions.

**Treasure #1** - Three important resources at the Wells Reserve website, and why these resources are useful:

**Treasure #2** - Read about the CDMO and SWMP. What are their purposes?

**Treasure #3** - “Real time” air temperature at the Wells Reserve:

**Treasure #4** -

Wells buoy identification letter:

Wind speed:

Wind direction:

**Treasure #5** -

Jordan Basin buoy identification letter:

Water temperature:

**Treasure #6 -**

Buoy station data:

Buoy	Predicted water depth, m	Name of buoy location	Actual water depth, m
A			
E			
I			
M			
N			
44005			
44011			

**Treasure #7 -** What is AIRMAP? What kind of data can be obtained from this site?

**Treasure #8 -** What's the weather forecast in your region for the next three days?

## Appendix C NOAA Treasure Hunt Answer Key

**Treasure #1:** <http://www.wellsreserve.org/>

Answers will vary: The Wells Reserve is a National Estuarine Research center. It consists of forest, estuary, and ocean ecosystems. The Reserve houses research, education, recreation facilities that include trails, the Dorothy Fish Coastal Resource Library, a visitor center with an exhibit area, and the Maine Coastal Ecology Center. The ecology center houses research, geographic information systems, and teaching labs that supports several staff scientists, interns, and visiting researchers. Studies include water quality, fish and fish habitat, salt marsh restoration, watershed protection, and shoreline change. The Minnow crew may be interested in using the microscopes and computers to learn about the Gulf of Maine.

**Treasure #2:** <http://cdmo.baruch.sc.edu/>

The Centralized Data Management Office (CDMO) provides technical support to groups that monitor water quality and biodiversity, and analysis of land use and habitat change.

The National Estuarine Research Reserve System (NERRS) has a System-Wide Monitoring Program (SWMP). The goal of the SWMP is to identify and track short-term variability and long-term changes in ecosystems and coastal watersheds.

**Treasure #3:** “Real time” Wells Reserve air temperature available at <http://cdmo.baruch.sc.edu/>

**Treasure #4:** Buoy C wind speed and direction available at: <http://www.gomoos.org/data/recent.html>

**Treasure #5:** Jordan Basin Buoy M water temperature available at: <http://www.gomoos.org/data/recent.html>

**Treasure #6:** [www.gomoos.org/data/recent.html](http://www.gomoos.org/data/recent.html)

Buoy	Location	Actual water depth, m
<b>A</b>	MA Bay	65
<b>E</b>	Central ME Shel	100
<b>I</b>	Eastern ME Shel	100
<b>M</b>	Jordan Basin	285
<b>N</b>	Northeast Channel	225
<b>44005</b>	Cashes Ledge	21
<b>44011</b>	Georges Bank	88

**Treasure #7:** <http://airmap.unh.edu>

AIRMAP is a UNH air quality and climate program. AIRMAP conducts atmospheric measurements to aid in making chemistry-climate connections in New England. Observations and research aid in forecasts of air quality, weather, and climate. AIRMAP assesses air quality in the region by conducting continuous measurements of chemical components including ozone (O<sub>3</sub>).  
<http://airmap.unh.edu/index-text.html>

**Treasure #8:** Weather forecasts for your region available at:  
<http://www.erh.noaa.gov/er/gyx/>

**Other NOAA-related resources can be found at NOAA Ocean Service Education:** <http://oceanservice.noaa.gov/education/>

- Teacher page contains lesson plans, curriculum materials, weather and climate change resources.
- Student page contains tutorials, games, resources, and projects.