

Science, Service, Stewardship



Integrating NOAA Data and Tools into Environmental Education Programs

2011 Gulf of Mexico B-WET Regional Meeting Agenda

April 21, 2011

**NOAA
FISHERIES
SERVICE**

NOAA



Objectives

- Learn of NOAA assets, with a focus on online data, available for use in inquiry-based education
- Share ideas to integrate assets into environmental education programs



Presentation Overview

- Definition of NOAA Assets
- Overview of Select NOAA Assets
- Connecting with a NOAA Scientist or Lab
- Your Ideas ...sprinkled throughout



NOAA Assets

Science Categories:

- Ocean
- Coastal
- Great Lakes
- Weather
- Climate

Includes:

- Protected natural areas
- Ocean-going ships
- Monitoring devices
- Scientists
- Web sites



NOAA Assets

Science Categories:

- Ocean
- Coastal
- Great Lakes
- Weather
- Climate

Includes:

- Protected natural areas
- Ocean-going ships
- Monitoring devices
- Scientists
- Web sites

**NOAA
FISHERIES
SERVICE**



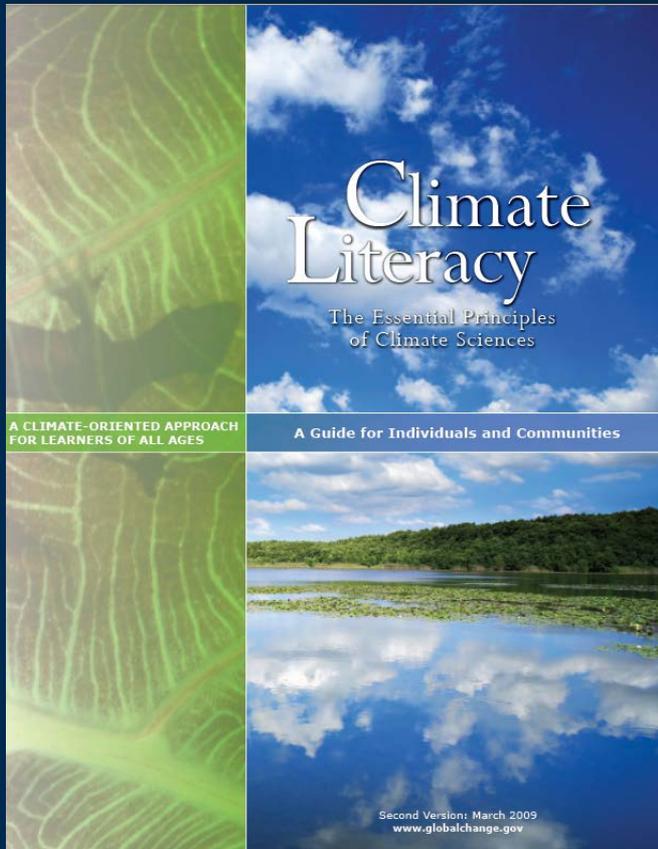
Have you used NOAA assets in your environmental education initiatives?

How?

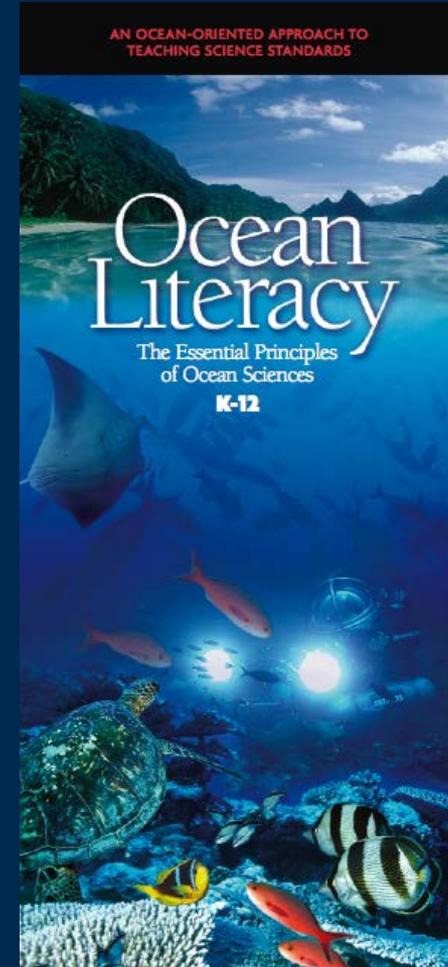
What are the challenges to using them?



Select NOAA Assets



[http://climate.noaa.gov/education/pdfs/
ClimateLiteracyPoster-8.5x11-
March09FinalLR.pdf](http://climate.noaa.gov/education/pdfs/ClimateLiteracyPoster-8.5x11-March09FinalLR.pdf)



[http://www.coexploration.org/oceanliteracy/d
ocuments/OceanLitChart.pdf](http://www.coexploration.org/oceanliteracy/documents/OceanLitChart.pdf)



NOAA Education Resources

NOAA EDUCATION RESOURCES
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

» Home » NOAA Education » About this Site » Contact Us » Feedback

Search up to five terms **SEARCH**

Ocean and Coasts | Climate | Weather and Atmosphere | Marine Life | Freshwater | Special Topics

Bay Watershed Education and Training

www.education.noaa.gov
Connecting Educators and Students to NOAA education and science resources

NOAAWatch Tsunami Page
Background information and links to resources on the causes of tsunami waves, warning systems, and how to be Tsunami Ready

Surface Oil Movement in Gulf Animation
Time lapse animation of surface oil movement from Deepwater Horizon oil spill.

Climate Change and Corals
Three simple classroom hands-on activities about ocean acidification and sea level rise.

Looking for materials from our old site?
NOAA EDUCATION
Advancing Environmental Literacy

Children doing a science experiment

- Tornado Watch along Southern Alabama and the Florida Panhandle
- Ireland: The Emerald Isle
- Swath of Snow Remains Along Great Lakes Region

Webcast

Live Tsunami Webcast
On March 24 at 1:30 PM EST, the Jason Project presents a live

Featured Resource Collections

- Tsunami**
A quick list of resources to help teach about the causes of tsunamis and tsunami safety... [Read More](#)
Ocean and Coasts
- Weather Observations**
This Collection provides educational lessons and resources for teachers as they teach about daily weather observations including clouds, precipitation, satellites and radar... [Read More](#)
Weather and Atmosphere
- Ocean Floor Features**
Educational resources and lesson plans about the exciting, dynamic, and largely unexplored features of the ocean floor... [Read More](#)
Ocean and Coasts
- Gulf Oil Spill**
Links to current information, images, and data about the Deepwater Horizon oil spill in the Gulf of Mexico... [Read More](#)
Ocean and Coasts

Educator Opportunities

- » Training/Workshops
- » Online and Self-Directed Learning
- » Experiential Learning
- » Events/Conferences

Student Opportunities

- » Scholarships
- » Internships
- » Fellowships
- » Special Opportunities

Funding Opportunities

- » Environmental Literacy Grants
- » BWET Meaningful Watershed Experience Grants
- » Cooperative Science Centers

NOAA News

- » Spring flooding underway





NOAA

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



» Home » NOAA Education » About this Site » Contact Us » Feedback

» SEARCH

Ocean and Coasts
Climate
Weather and Atmosphere
Marine Life
Freshwater
Special Topics

Home >> Ocean and Coasts >> Oil Spill

Resources

Multimedia

- » NOAA Oil Spill Imagery
- » Oil Spill Monitoring Videos
- » RestoreTheGulf.gov Multimedia Page
- » Surface Oil Movement in Gulf Animation
- » NOAA Scientists Answer Your Questions
- » Gulf Spill Restoration

Lessons and Activities

- » Cleaning Oiled Feathers (ES)
- » Graphing Changes in Marine Life After The Exxon Valdez (HS)
- » Human Impact on Estuaries (HS)
- » Using Maps To Evaluate Environmental Tradeoffs (HS)
- » Fix It- Natural Resource Restoration (HS)

Real World Data

- » GeoPlatform Gulf Response Map
- » Interactive Map of historic oil spills
- » GHOME- Downloadable Oil Spill Trajectory Model (HS)

Background Information

- » NOAA's Gulf Oil Spill Response
- » Interagency Unified Command Site for the Deepwater Horizon Oil Spill
- » The Science of Oil Spills
- » Oil Spill Effects on Wildlife
- » Oil Spill Fact Sheets
- » Smithsonian Ocean Portal Oil Spill Page
- » Gulf of Mexico Deep-Sea Ecosystems

Career Profiles

- » Profile of NOAA Spill Responder

Gulf Oil Spill

On April 20, 2010, an explosion on the Deepwater Horizon/BP MC252 drilling platform in the Gulf of Mexico caused the rig to sink and killed 11 workers. As a result, oil began leaking into the Gulf creating the largest spill in American history to date.

Over the course of 87 days an estimated 4.9 million barrels of oil were released into the Gulf. Although research continues to determine the full extent of the damage, we know that this spill impacted wildlife, habitats, fishing communities, and commerce along the large coastal areas of Louisiana, Mississippi, Texas, Alabama, and Florida.

Impacts to Wildlife

Sea turtles and marine birds were some of the first wildlife affected by the oil as they live and feed in the surface areas where floating oil collects. Marine mammals such as dolphins and whales are other affected species, as they must come to the surface to breathe. Oil accumulated on the skin of animals can make it difficult to breath and move in the water. Oiled birds can lose the ability to fly, dive for food, or float on the water which could lead to drowning. Oil also interferes with the water repellency of feathers and can cause hypothermia under the right conditions. Ingested oil can kill animals immediately; more often it results in lung, liver, and kidney damage which can lead to death. Extensive efforts to prevent more extensive wildlife impacts, rescue and rehabilitate oiled animals, and investigate possible long-term effects of oil exposure are ongoing. [\(Source: USFWS\)](#)

Fisheries

Fish, shrimp, and shellfish are integral to the food web of the Gulf as well as the economic health of the region. To minimize human exposure to potentially unsafe seafood from the spill region, more than 80,000 square miles of commercial and recreational fishing grounds were closed while scientists investigated the impact of the spill and clean-up efforts on these organisms. After careful research on the presence of chemical and microbial contaminants in species from all levels of the food chain, portions of the region deemed safe by FDA and NOAA scientists were re-opened to fishing. Once again, Gulf fisherman have access to valuable fishing grounds and consumers and fish sellers are protected knowing that only safe seafood is entering the marketplace from this area. Ongoing monitoring continues to insure safety of seafood and changes in the Gulf habitats. [\(Source: NOAA Keeping Seafood Safe\)](#)




Oiled turtle is recovered from Gulf of Mexico by NOAA Scientist

Real World Data



Water Cycle

Resources

Multimedia

- [» Water Cycle Multimedia Module \(MS, HS\)](#)
- [» Global Precipitation and Energy Tutorial](#)
- [» Blue Planet Video](#)

Lessons and Activities

- [» Water Cycle Game \(ES, MS, HS\)](#)
- [» Water, Water Everywhere \(ES, MS, HS\)](#)
- [» Rivers to the Sea and Back Again \(ES\)](#)
- [» Water Cycle Wheel \(ES, MS\)](#)
- [» Five simple water cycle activities \(ES, MS\)](#)
- [» Drought Online Unit \(MS, HS\)](#)

Real World Data

- [» Observed Precipitation Data](#)
- [» Interactive Snow Map](#)
- [» Interactive River Observation Map](#)
- [» Interactive Evaporation Maps](#)
- [» Satellite Animations and Imagery](#)
- [» Groundwater Data from USGS](#)

Background Information

- [» The Hydrologic Cycle](#)
- [» Water Vapor Satellite Interpretation](#)
- [» Water and Climate](#)
- [» Flood Hazards](#)
- [» All About the Cryosphere](#)
- [» MetEd Watershed Module \(MS, HS\)](#)

Water is constantly in motion. Sometimes quickly, as in a fast-flowing river, but sometimes it moves quite slowly, like in underground aquifers, glaciers and deep ocean currents.

The water cycle, is often shown as a simple circular cycle (as in the accompanying diagram) in which water evaporates from the ocean, is carried over land, falls as rain, and then travels back to the ocean through rivers.

Although a drawing of the water cycle oversimplifies the actual movement of water, the diagram is a useful tool. The actual path any given water molecule follows in a complete water cycle can be varied and complex and may not follow the exact path shown by a diagram.

It is also important for students to understand that water cycle diagrams do not show the amount of time that a water molecule may take as it travels through the water cycle. For instance, water starting in the Antarctic may take over 250 years to travel along the bottom of the Pacific Ocean before it re-surfaces near Alaska. Water can also remain frozen in a glacier or ice sheet for thousands of years before re-melting.

Water may also change state, back and forth, from a liquid, gas and solid (condensing, evaporating, etc.) as it travels through the cycle. Water even travels underground, where it seeps through the spaces between grains of soil, sometimes coming to the surface as artesian springs.

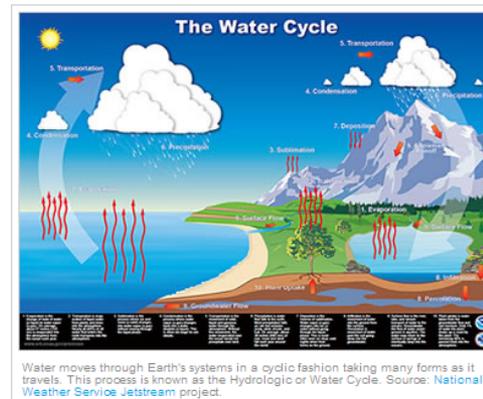
Living organisms also move water around. Water, is either directly consumed as liquid or extracted from food and then carried within bodies. It leaves the organism as a gas during respiration, is excreted or may evaporate from the skin as perspiration. Plants are the major biotic movers of water. Their roots

collect water for distribution throughout the plant. Some of the water will be used in photosynthesis, but most travels to the leaves where it is easily evaporated.

Although water vapor is invisible, fog and clouds do give some indication of water vapor in the atmosphere. Water condensation, seen as early morning dew or even on a cold glass, is one visible example of the water vapor present in our air. In clouds, water molecules condense and collect on microscopic dust particles into droplets until they become heavy enough that gravity pulls the water down as precipitation- in the form of rain, snow, sleet or hail.

Education Connection

The water cycle is more than a diagram it has significant impacts on our daily lives, local and global ecosystems and even economic systems. The resources in this collection can help teachers take students beyond just a minimal knowledge of a simple diagram of the cycle. This collection provides real-time and historic data sources that track and measure the water in different portions of the water cycle; satellite images shows water vapor in the atmosphere, interactive maps can be searched to show precipitation, snow depths, river flows and evaporation rates. Included are also lessons, games and





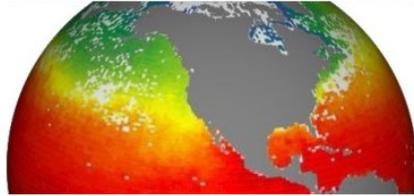
NOAA Ocean Data Education (NODE) Project

Data in the Classroom

About NODE Project Downloads

Investigate Earth processes using real data:

- [El Niño](#)
- [Sea Level](#)
- [Water Quality](#)



• **Free curriculum**

We've developed three curriculum modules for grades 6-8 that demonstrate techniques for using real data in the classroom:

- [El Niño](#)
- [Sea level](#)
- [Water Quality](#)

Help yourself to any of the documents in the [Downloads](#) section.



• **Learn more**

We're taking a systems approach to learning about the Earth using real scientific data. Our goal is to design easy-to-use curriculum activities and simple, intuitive computer interfaces for accessing online data. It's all part of a NOAA-supported effort called the [NODE Project](#)



• **Tell us what you think**

If you have used any of our curriculum modules with your students, we would appreciate getting your feedback through one of our [evaluation surveys](#).

Data in the Classroom was developed in collaboration with:



NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM



National Oceanographic Data Center



INTEGRATED OCEAN OBSERVING SYSTEM

Privacy Policy Contact Site Map

<http://dataintheclassroom.org>

Level 1

Level 2

Level 3

Level 4

Level 5

Get Data

Teachers

Survey

Water Quality

Changes in water quality conditions have a big impact on organisms living in estuaries. But how is water quality monitored?

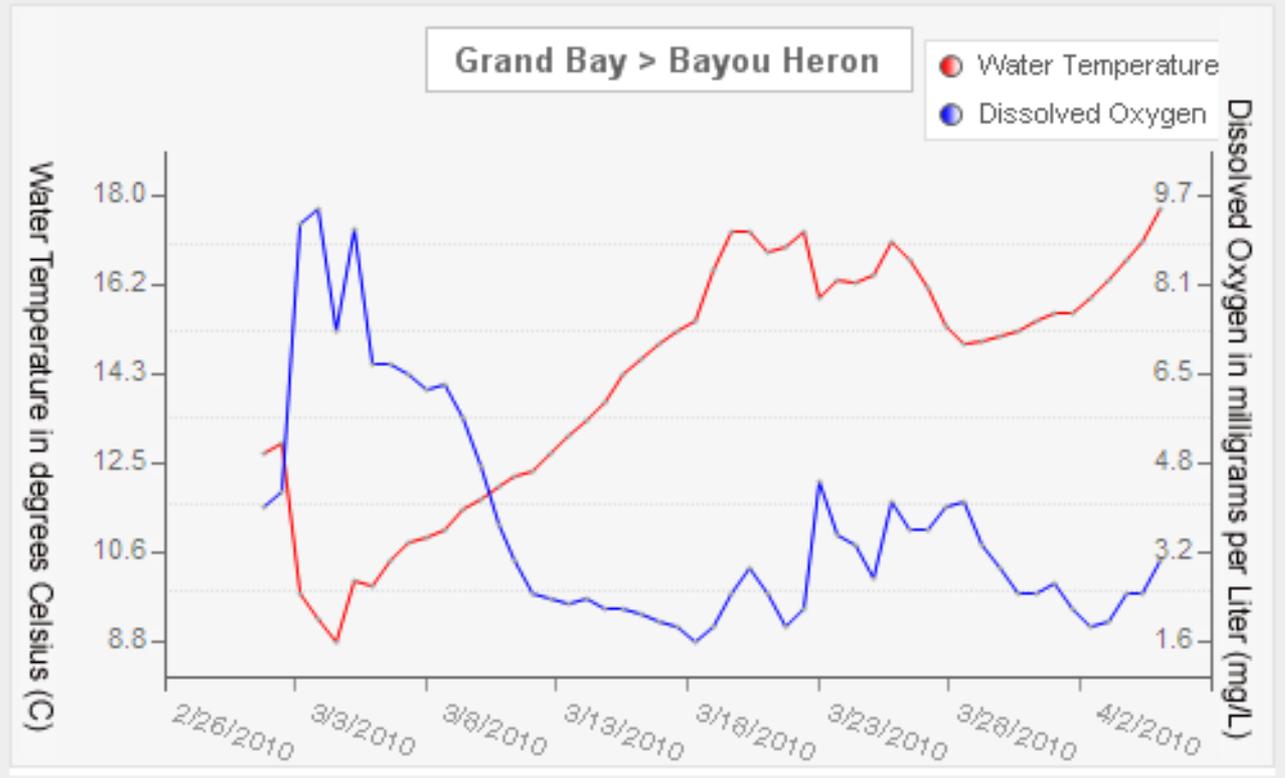
This Web site features five activities at different levels to help you learn about data.

Teachers: [start here](#)

Links

- [Estuaries.gov](#)
- [National Estuarine Research Reserves System \(NERRS\)](#)
- [System-wide Monitoring Program Water Quality Indicators](#)

Graph





estUARIES.gov

Home | Contact Us | Español
Advanced Search

About Estuaries | EstuaryLive | Science & Data | Educators | Students | Get Involved | Resources

About SWMP Data | Graphing Tool Tutorial | Graphing Tool | Data Lesson Plans | Interpreting the Data

Science & Data

Vital Signs of our Estuaries

Land & Water Protected | Water Quality Conditions | Weather Conditions | Changes in Habitats | Biological Communities

Interactively Explore + Learn About The Chesapeake Bay
Get introduced to bay data by using National Geographic's FieldScope tool in Activity 1.

Real-Time Data
Find current conditions

Data Graphing Tool
Explore water quality and weather data

Estuary Data | SWMP Stories

Monitoring the Health of Our Estuaries

The National Estuarine Research Reserve System-wide Monitoring Program (SWMP) tracks short-term variability and long-term changes in estuarine waters to understand how human activities and natural events can change ecosystems.

[Learn More](#)

About NERRS SWMP Data Stations & Parameters

[Learn More](#)

Graphing Tool Tutorial
Instructions & Tips for New & Experienced Users

[Learn More](#)

NOAA | National Ocean Service | Web Site Owner: Ocean and Coastal Resource Management | nerrs.noaa.gov
About | Site Map | Acknowledgements | Disclaimer | Privacy Policy | How to Use This Site | Webmaster



The Bridge Data Series Archive



An ocean of free teacher-approved marine education resources



[OCEAN SCIENCE TOPICS](#)

[LESSON PLANS](#)

[RESEARCH & DATA CONNECTIONS](#)

[PROFESSIONAL DEVELOPMENT](#)

[GUIDING STUDENTS](#)

[RESOURCE CENTER](#)

[ABOUT THE BRIDGE](#)

[COMMUNICATE](#)

[HOME](#)

GO



[NATIONAL MARINE EDUCATORS ASSOCIATION](#)



DATA Series Archive

Welcome to the Bridge Data Tip Archives. The Data Tips are now categorized by subject. Feel free to search under the topics below for great classroom data activities.



[Ocean Observing Systems](#)

Find out the salinity in the Gulf of Maine, the dissolved oxygen in the Chesapeake Bay, and the water temperature at a coral reef in Puerto Rico. These data and more are available through ocean observing systems 24 hours a day. Investigate the water from across the globe right at your computer using these data activities.



[Biology](#)

Interested in geese, oysters or fish communities? Want to talk about sea turtles, exotic species, sharks or swordfish? Want you like to travel to the Galapagos or accompany gray whales on their annual migration? Check out this page to find biological data tips.



[Human Activities](#)

Become an ocean explorer! Discover shipwrecks and visit underwater habitats using state of the art technology. Investigate estuaries, aquaculture, recreational fishing issues, or oil spills. Visit this page to find human activity data tips.



[Ecology](#)

Stop an alien invasion! Find out why are coral reefs at risk. Explore national sanctuaries or become a Bay investigator. Ecological concepts are the subject of these data tips.



[Physics](#)

Are you psychic...think you can predict the tides? Do drifter data describe wandering souls or ocean currents? Find out the answers to these questions and more on this physics page.



[Chemistry](#)

Prepare to enter the dead zone. Examine seasonal temperature stratification of the largest fresh surface water system on earth. Learn how to predict temperature profiles and graph dissolved oxygen data. Visit this page to find chemistry data tips.



[Climate](#)

What has ceased increasing? Could it be the hole in the ozone? Do you believe in global climate change? How are hurricanes formed and what does El Nino have to do with sea level? Determine the answers to these and other questions in this climate section.



[Geology](#)

Bring an Axial Volcano into your classroom! Create an underwater landscape. Find out what factors influence the flux of sand or conduct your own beach profile. Check out this page for geology data tips.

The Bridge is sponsored by [NOAA Sea Grant](#) and the [National Marine Educators Association](#)



An ocean of free teacher-approved marine education resources

Bridge DATA Series

Watersheds

What's in Your Watershed?

Written by: Lisa Ayers Lawrence, Virginia Sea Grant, Virginia Institute of Marine Science
Credits: Dave Fuss, Lewis Lawrence, Middle Peninsula Planning District Commission

Summary

Examine land use in the Chesapeake Bay watershed and determine if these areas are protecting the water with vegetated buffers.

Objectives

- Define the term watershed and explain the importance of riparian buffers.
- Examine types of land use and acreage used in subwatersheds in the Chesapeake.
- Evaluate the impacts of land use in the Chesapeake on water quality.

Vocabulary

Watershed, Riparian buffer

Introduction

When we are age 4 or 5, our parents and teachers begin teaching us our telephone number and address. The importance of knowing these is obvious—to help ensure our safe return when we are lost. But do you know your [watershed address](#)? Everybody has one, and it's an important address to know, because we each impact our watershed. Not only do you consume the water in your watershed, but your activities, such as clearing vegetation or fertilizing your lawn, can

Grade Level:
9-12

Lesson Time:
1.5 -2 hrs.

Materials Required:
[Dragon Run Swamp data](#) (Excel), [Dragon Run pie chart worksheet](#) (pdf)

Natl. Science Standards
[Click here for a list of the aligned National Science Education Standards.](#)

Related Resources
[Pollution](#), [Estuary](#)

[OCEAN SCIENCE TOPICS](#)

[LESSON PLANS](#)

[RESEARCH & DATA CONNECTIONS](#)

[PROFESSIONAL DEVELOPMENT](#)

[GUIDING STUDENTS](#)

[RESOURCE CENTER](#)

[ABOUT THE BRIDGE](#)

[COMMUNICATE](#)

[HOME](#)



SEARCH


[NATIONAL MARINE EDUCATORS ASSOCIATION](#)



**NOAA
FISHERIES
SERVICE**



NOAA.education.gov

NODE

Estuarues.gov

[The Bridge Data Series Archive](#)

Have you used items found in the online NOAA resources described thus far?

In what way?

What other similar NOAA or non-NOAA resources have you used?



Other NOAA Assets B-WET Recipients Use

- NOAA Mussel Watch
 - Program Overview: <http://ccma.nos.noaa.gov/about/coast/nsandt/musselwatch.html>
 - Data Portal: <http://ccma.nos.noaa.gov/about/coast/nsandt/download.html>
- Digital Library for Science and Education: www.dlese.org
- GLOBE: <http://globe.gov/>
- Science on a Sphere: <http://sos.noaa.gov/>
- NOAA Ocean Exploration: <http://oceanexplorer.noaa.gov/edu/materials.html>
- NOAA Photo gallery: <http://www.photolib.noaa.gov/>
- Monitoring Oil Spill Response and Restoration: www.GeoPlatform.Gov

**NOAA
FISHERIES
SERVICE**



**Jeannine Montgomery
NOAA Education Outreach Center
NOAA Office of Education
1305 East West Highway, SSMC4, Rm 1W514
Silver Spring, MD 20910
301-713-1208**

Jeannine.Montgomery@noaa.gov

**Request lessons, posters, and other educational and
supporting materials**



Connecting with a Scientist or Lab

- Ask NOAA via Answers@NOAA
<http://findanswers.noaa.gov/noaa.answers/consumer/search.asp>
- Feedback button at NOAA.Education.Gov
<http://www.education.noaa.gov/Suggest.php>
- NOAA in Your State
<http://www.legislative.noaa.gov/NIYS/>
- NGI Researcher Information Database
<http://www.northerngulfinstitute.org/researchers/index.php>
- NOAA Regional Collaboration Team



Tip!



watershed site:noaa.gov

Find web pages that have...

all these words:

watershed

this exact wording or phrase:

one or more of these words:

OR

OR

But don't show pages that have...

any of these unwanted words:

Need more tools?

Reading level:

no reading level displayed

Results per page:

10 results

Language:

any language

File type:

any format

Search within a site or domain:

noaa.gov

(e.g. youtube.com, .edu)

[+](#) [Date](#), [usage rights](#), [numeric range](#), and more

Advanced Search