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CLAIRE FACKLER

SEABERRY NACHBAR



Overview



- What is the California B-WET Program?
- Funding Announcement for 2019
- Application Package
- How to Apply for a B-WET grant
- How to write a B-WET grant
- Review Process
- Questions?



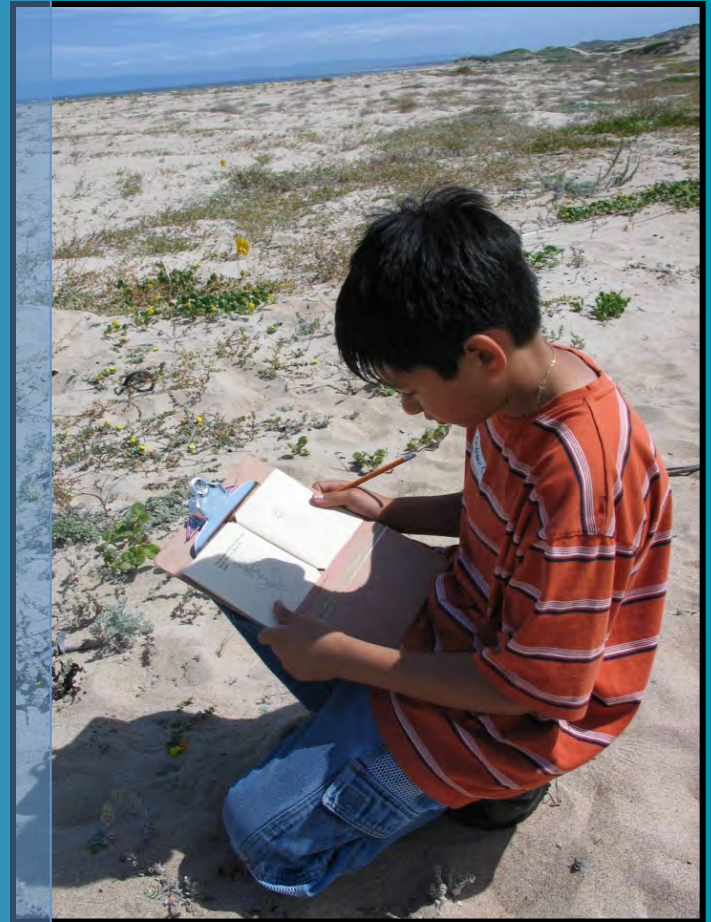
What

An environmental education program that promotes locally relevant, systemic experiential learning in the K-12 environment.



Meaningful Watershed Educational Experiences (MWEE)

- Focused on a question, problem or issue that is within the context of the local community
- Direct connection to the marine , estuarine and sanctuaries
- Investigative or project oriented-stewardship action project
- Integral part of the classroom activities
- Part of a sustained activity



MWEE Guide



Student Components

- Teacher participation for the duration of the MWEE
- Integration with classroom curriculum
- Use of the local context for learning
- Experiences are a set of activities over time



Teacher Components

- Allows for adequate instructional time
- Provides ongoing teacher support and appropriate incentives
- Meets jurisdictional guidelines for effective teacher professional development



Additional Components

- Educating Every Student In, About, and For the Environment
- Projects make a connection to the sanctuary
- Climate change education
- Includes NOAA assets, including personnel and resources




Our Organization



NATIONAL MARINE SANCTUARY SYSTEM



A full-page background image showing a diver in a dark wetsuit swimming through clear blue water. The diver is positioned on the left side of the frame, facing right. Large, green kelp stalks with long, narrow leaves dominate the center and right side of the image, extending from the bottom towards the top. The lighting is bright and even, suggesting a sunny day underwater.

“Areas of the marine environment with special conservation, recreational, ecological, historical, cultural, archeological, or esthetic qualities...”



NATIONAL MARINE
SANCTUARIES

*National Marine Sanctuaries are
Living Classrooms where People can
See, Touch, and Learn
about the Nation's Great Lakes
and Ocean Environments.*



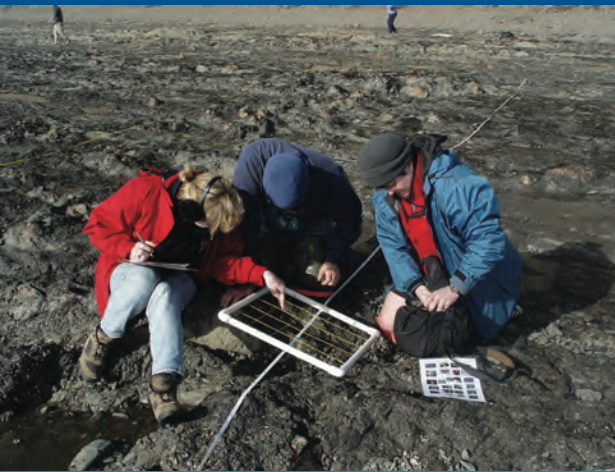
LIMPETS Network



Photo: Daniel Dreifuss, Santa Maria Times

<http://limpets.org>

LiMPETS Rocky Intertidal Monitoring



LiMPETS Sandy Beach Monitoring



<http://limpets.org>



VIRTUAL DIVES

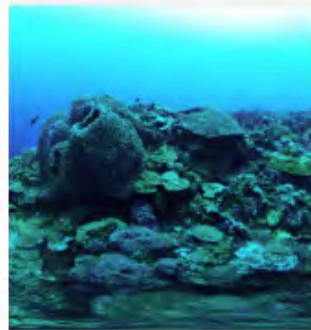
An immersive 360 view of your national marine sanctuaries



AMERICAN SAMOA



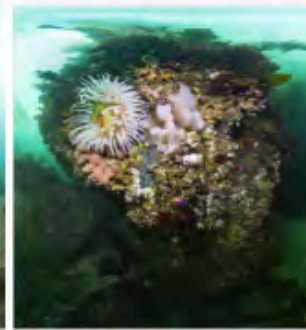
FLORIDA KEYS



FLOWER GARDEN BANKS



GRAY'S REEF



OLYMPIC COAST



THUNDER BAY

<http://sanctuaries.noaa.gov/vr>

Gray's Reef National Marine Sanctuary



<http://sanctuaries.noaa.gov/vr>

Florida Keys National Marine Sanctuary




<http://sanctuaries.noaa.gov/vr>

DIVE IN

All you need is an internet connection!



These sanctuary views can be seen on a personal computer or a smartphone. Pair your phone with a virtual reality headset or goggles of your choice (and click the  icon) for an extra-immersive experience.

Select which sanctuary you want to visit above and click on a panorama to start your dive!



<http://sanctuaries.noaa.gov/vr>

Virtual Reality



<http://sanctuaries.noaa.gov/vr>



<http://sanctuaries.noaa.gov/education>



[http://sanctuaries.noaa.gov/education/
ocean_guardian_prog.html](http://sanctuaries.noaa.gov/education/ocean_guardian_prog.html)

Protect Our Ocean Activity Book

BE AN OCEAN GUARDIAN



www.sanctuaries.noaa.gov/education/kids_club.html
<http://marinedebris.noaa.gov/marinedebris101/>



Ocean Guardian Activity Book

www.sanctuaries.noaa.gov | www.marinedebris.noaa.gov

13 Million Pounds?!

It is estimated that 13 million pounds of litter are put into the ocean each year.* This litter is generated by many sources, from boats and off rigs on the water to picnickers, fishermen, and beachgoers along the shore. Hidden below is a list of objects that have been discarded into our oceans. See if you can find them all!

★

N	B	A	B	I	H	O	S	E	A	T	M	R	G	
E	G	U	T	A	C	A	N	C	E	W	E	L	L	
K	L	R	C	R	L	A	R	N	R	N	O	U	A	
T	O	A	P	K	C	L	G	D	I	A	K	M	S	
R	V	D	O	A	E	N	O	A	H	W	T	B	S	
A	E	I	D	W	I	T	T	O	A	A	M	E	B	
S	H	O	E	H	D	N	G	R	N	L	T	R	O	
H	S	W	S	(B	O	T	T	L	E	C	A	P)
B	K	I	P	C	T	S	J	B	U	R	G	Y	T	
A	F	U	T	D	I	A	P	E	R	D	O	L	L	
G	C	I	G	A	R	E	T	T	E	U	T	P	E	
W	A	N	X	O	E	U	O	H	B	A	S	N	E	
B	F	I	S	H	I	N	G	L	I	N	E	H	M	

*1997 U.S. Academy of Sciences study.

These hidden words are listed horizontally, vertically and diagonally. www.marinedebris.noaa.gov

BART CONTAINER	CRATE	FISHING NET	LUMBER	SHOE
BALLOON	CUP	GLASS BOTTLE	PAINT BRUSH	SOAK CAN
BUCKET	DAMPER	GLOVE	RADIO	STRAW
BOOT	DRILL	HAND KAT	ROPE	TRIE
CIGARETTE	FISHING LINE	HOSE	RUG	TRASH BAG

This activity page is an excerpt from "Understanding Marine Debris, Games and Activities for Kids of all Ages"

www.sanctuaries.noaa.gov | www.marinedebris.noaa.gov

How Long Will it Take?

It takes just a moment for an item to be carelessly discarded or blown by wind into the ocean, but it can take many, many years for that item to completely decompose. Test your knowledge about decomposition time. Draw a line between each item (left) to its corresponding decomposition time (right).

How Many Years Will it Take for These Items to Decompose in the Ocean?

		Undetermined
		600 Years
		450 Years
		200 Years
		50 Years
		1-5 Years
		3 Months
		2-6 Weeks

The answers are on the back cover.

This activity page is an excerpt from "Understanding Marine Debris, Games and Activities for Kids of all Ages"

Grades K-3

<http://sanctuaries.noaa.gov/education/pdfs/ogab.pdf>



Ocean Guardian Kids Club

Open to all K-8 students around the United States

Ocean Guardian Pledge

Because I want to help the ocean and the creatures in it, I pledge today to do these things and accept membership into the Ocean Guardian Kids Club:

- Promote ocean awareness and pass on my knowledge to friends and family.
- Clean up the beach, park, or river and leave it better than I found it.
- Reduce my eco-footprint by cutting down on my use and waste.
- Reuse or repurpose products to extend their usable life.
- Recycle, and use products made of recycled materials.
- Conserve natural resources.

Signature:

sanctuaries.noaa.gov/education

http://sanctuaries.noaa.gov/education/kids_club



Where is this in California?
What is a MPA?

CHANNEL ISLANDS

National Marine Sanctuary



Instructions: Select one of the five Channel Islands below to explore marine protected areas in more detail.

KEY		BOUNDARIES		PROTECTED AREAS		CREDITS
	Channel Islands National Park (1 nautical mile)		Marine Reserves	no commercial or recreational fishing allowed		
	State Waters (3 nautical miles)		Marine Conservation Area	allows recreational lobster & pelagic finfish		
	Channel Islands National Marine Sanctuary (6 nautical miles)		Marine Conservation Area	allows commercial and recreational lobster & recreational pelagic finfish		

[Back to Main Menu](#)

©2010 Google

San Miguel Island



Play movie

Richardson Rock
Marine Reserve



[see images](#)

Castle
Rock

Otter
Harbor

Harris
Point

Simonton
Cove

Cuyler
Harbor

Prince Island

Harris Point
Marine Reserve



[see images](#)

Bay Point

Cardwell
Point

Crook
Point

Tyler
Bight

Judith
Rock

Adams
Cove

Point Bennett
ELEPHANT
SEAL



Play movie

Judith Rock
Marine Reserve



[see images](#)

CHANNEL ISLANDS
National Marine Sanctuary



[Zoom out](#)

http://www.cisanctuary.org/map-edu%20content/base_96.html

Sanctuary Radio Program: Tune into the Ocean



Sanctuary Radio Program: Ocean Currents on Community Radio for West Marin KWMMR

When: Tune into Ocean Currents the first Monday of every month at 1:00 PM (Pacific Time)

What: Radio Program

The ocean covers 75% of our planet, we truly live on planet ocean! Discover the depths and far reaches of this watery realm by tuning in. We'll talk with experts in the field about current research, management issues, natural history, and stewardship associated with the marine environment, especially in our National Marine Sanctuaries.

How can I listen? Community Radio for West Marin 90.5 FM in Point Reyes Station and 89.9 FM in Bolinas, and always on the web at www.kwmmr.org.

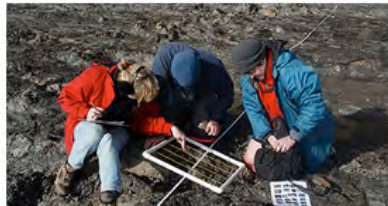
Listen to Positively Ocean!

Positively Ocean is a 5 minute spot that airs during Ocean Currents episodes and highlights a positive story about the ocean about whats working well for the ocean.

EDUCATION

Enhancing public awareness, understanding, and appreciation of the marine environment

LEARN

[Education](#)[Teachers](#)[Students](#)[Games and Activities](#)[Sanctuary History](#)[Frequently Asked Questions](#)

FOR TEACHERS

The NOAA Office of National Marine Sanctuaries aims to provide teachers with resources and training to support ocean literacy in America's classrooms.

[Teacher Resources & Opportunities](#)

FOR STUDENTS

National marine sanctuaries are living classrooms that can be explored in person or through interactive digital labs and activities.

[Marine Careers & Opportunities](#)

<http://sanctuaries.noaa.gov/education>

NOAA Marine Debris Program
NOAA Office of National Marine Sanctuaries

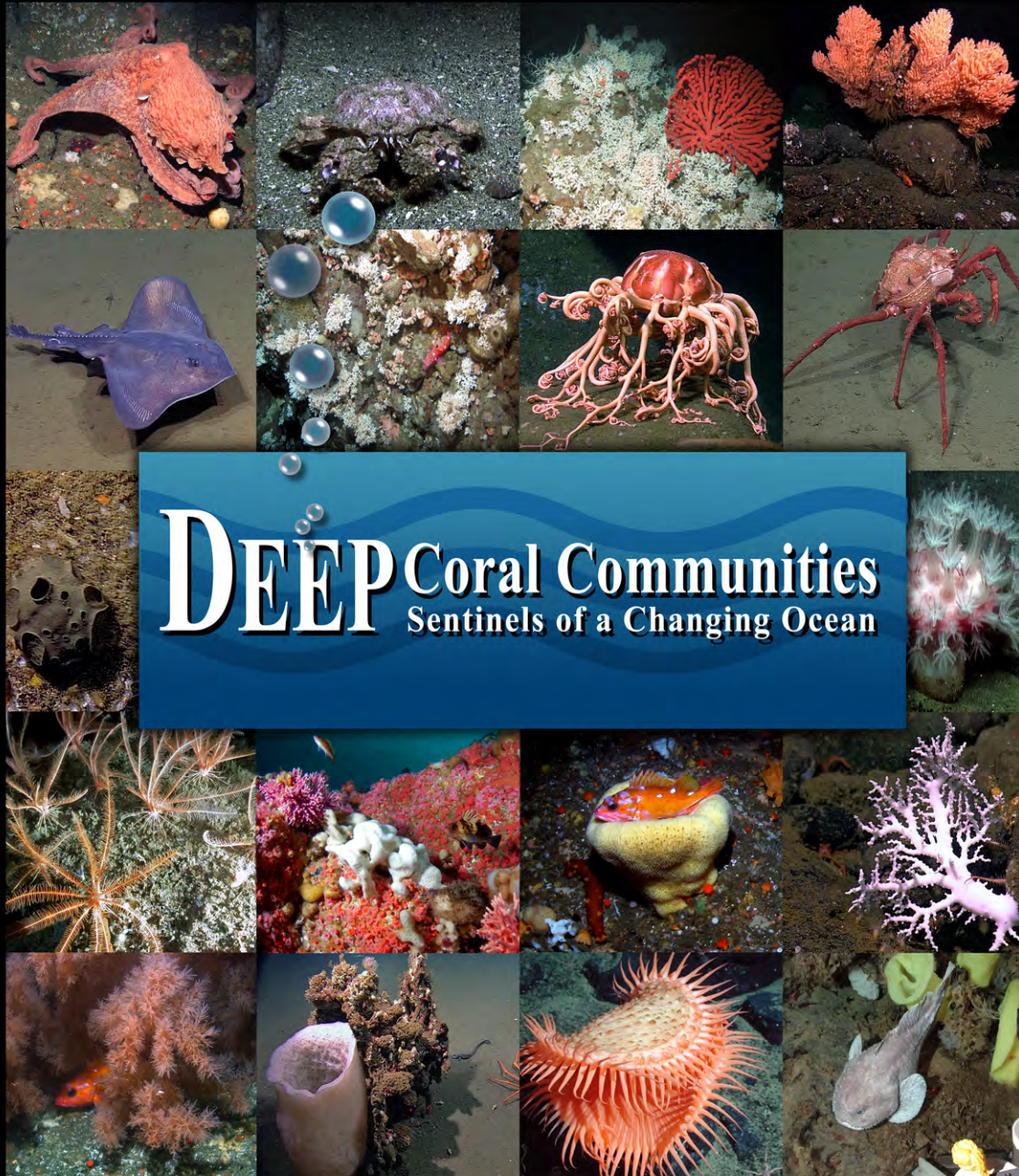
Marine Debris Toolkit

for educators



Marine Debris Toolkit for Educators





Teacher Materials



Deep Coral Communities: Sentinels of a Changing Ocean

[Lesson Plan](#)

[Introduction Video](#)

[Download](#)

[View](#)

[Introduction PowerPoint](#)

[Introduction PowerPoint Script](#)

[ROV Transects](#)

[Species ID Guide](#)

[Student Transect Data Questions](#)

[Transect Data Sheet](#)

[Sample Graph](#)

[Teacher Answer Sheet](#)

[Interactive Poster](#)

[Poster Identification Guide](#)

Sites

Channel Island Transects



Deep (>100 meters)

[Deep 1 - The Footprint](#)

[Download](#)

[View](#)

[Deep 2 - The Footprint](#)

[Download](#)

[View](#)

[Deep 3 - Piggy Bank](#)

[Download](#)

[View](#)

[Footprint Alternative](#)

[Download](#)

[View](#)

[Piggy Bank Alternative](#)

[Download](#)

[View](#)

[Deep Sea Overview Video](#)

[Download](#)

[View](#)

Shallow (<100 meters)

[Shallow 1 - Carrington](#)



Ocean Acidification Communication Toolkit: Dungeness Crab Case Study

Dungeness crab is a valuable species throughout the national marine sanctuaries of the West Coast from Washington state to throughout California. This communication toolkit is designed for educators and communicators to use to teach others about the impact of ocean acidification on Dungeness crab.

The toolkit includes: fact sheet; infographic; PowerPoint slideshow with script; reference list; resource list; public domain video B-roll; and public domain images.



FACT SHEET

This [fact sheet](#) is for a general audience and provides background information on how ocean acidification will affect Dungeness crabs, why Dungeness crabs are so important, and how NOAA is working to help protect this species.



POWERPOINT SLIDESHOW AND SCRIPT

The PowerPoint provides a case study examining how ocean acidification affects Dungeness crab.



INFOGRAPHIC

This [infographic](#) poster shares the Dungeness crab and ocean acidification story visually and can be reproduced for education and outreach purposes.



Voices of the Bay

Voices of the Bay introduces students to Monterey Bay's rich fishing heritage as well as its relevance and value today. Each of the three instructional modules that make up the Voices of the Bay curriculum may be implemented as stand-alone activities or sequenced, in the order suggested below, as a more comprehensive course of study.



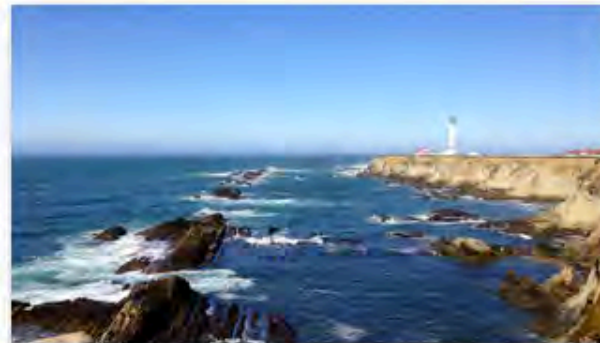
Winged Ambassadors

Albatrosses, charismatic and threatened seabirds, are ambassadors for a clean ocean. They traverse vast oceanic regions searching for floating food. Along their journeys, they ingest plastic trash and are hooked in fisheries. These five lessons use inquiry-based science instruction, aligned to standards for grades 6 - 8 with extensions for grades 9 - 12.



Ocean Acidification (OA)

Our carbon emissions are making the ocean more acidic, which threatens life in the global ocean. Use these resources to educate yourself and others to take action. Or watch science lectures on the topic of OA and download [education resources for the high school classroom](#).



Coastal Ecosystem

The Farallones Marine Sanctuary Association has developed a seven-unit Coastal Ecosystem Curriculum for grades 9 - 12 that focuses on the open water and intertidal habitats in Greater Farallones National Marine Sanctuary. Teachers and educators who attend our teacher workshops receive this curriculum and all associated classroom activities.

National Marine Sanctuary Curriculum

Lesson Plan

Exploring National Marine Sanctuaries



Photo: Greg McFall, NOAA

Grade Level

- 7-8
Life Science / Earth Science

Timeframe

- 20 minutes for teacher to introduce and two 45-minute class periods for presentations

Materials

- National Marine Sanctuaries Student Project and Further Understanding worksheets (Download at <http://sanctuaries.noaa.gov/education/teachers/features/lpexpl ore.html>)
- Each student group will need poster board and materials
- Overhead of national marine sanctuaries map, available at <http://sanctuaries.noaa.gov/education/teachers/features/lpexpl ore.html>
- Internet access

Activity Summary

In this lesson, students will learn about the national marine sanctuaries found in the Pacific and Atlantic oceans and off the coast of American Samoa. They include breeding and feeding grounds of whales, sea lions, sharks, and sea turtles; significant coral reefs and kelp forest habitats; and the remains of the U.S.S. *Monitor*, a Civil War ironclad that sank off the coast of North Carolina. By learning about the biodiversity, ecological integrity and cultural legacy of these marine sanctuaries, students can place into context what they are learning about the interdependence of living things on our planet.

Learning Objectives

Students will be able to:

- use the internet to research national marine sanctuaries—America's ocean and Great Lakes treasures;
- identify major groups of organisms living in and protected by national marine sanctuaries;
- describe various habitats found in national marine sanctuaries;
- list characteristics that define various national marine sanctuaries, including their similarities and differences;
- identify some of the resource issues threatening the ocean, and specifically our national marine sanctuaries;
- describe human interactions with the ocean and will be able to explain the importance of marine protected areas; and



<http://sanctuaries.noaa.gov/education>

Education



Photo: Michael Rodden

An orca or killer whale breaching in Monterey Bay National Marine Sanctuary off California.



Photo: Claire Fiedler, NOAA

An endangered Hawaiian green sea turtle in the Hawaiian Islands Humpback Whale National Marine Sanctuary.



Photo: G.P. Schuch, NOAA

A cluster of male ruby brittle stars atop a brain coral in Flower Garden Banks National Marine Sanctuary.

Exploring National Marine Sanctuaries Student Project Worksheet

Name: _____

Your group will create a poster about one of the national marine sanctuaries being protected by the National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries. For each marine sanctuary, you will find a link with lots of information about that sanctuary. Your poster should address all of the questions contained in the chart below.

The resources you will need can be accessed from the following websites: <http://sanctuaries.noaa.gov/>, <http://marinelife.noaa.gov> and <https://instagram.com/noaasanctuaries/>.

Fill out the chart as you explore the websites to help you gather the information you will need.

What is the name of your national marine sanctuary and where is it located?

What kinds of habitats are found there?

<http://sanctuaries.noaa.gov/education>

<http://sanctuaries.noaa.gov/education>

National Marine Sanctuaries of the West Coast Field Guide

NATIONAL MARINE SANCTUARIES OF THE WEST COAST

Habitats

Deep Seamounts

Deep seamounts are isolated, rocky hills that rise from the seafloor. They are home to a variety of marine life, including fish, invertebrates, and plants. The deep seamounts of the West Coast are some of the most diverse and productive ecosystems on the planet.

Deep Seamount

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RESEARCH

Conservation Science for Sea Sanctuaries

Understanding What We Know

Monitoring Change

Managing Sea Sanctuaries

Managing for the Future

Science also lives www.sanctuaries.noaa.gov/science/

CONNECTED BY THE

Currents

Montere Bay

AVHRR SST (°C)

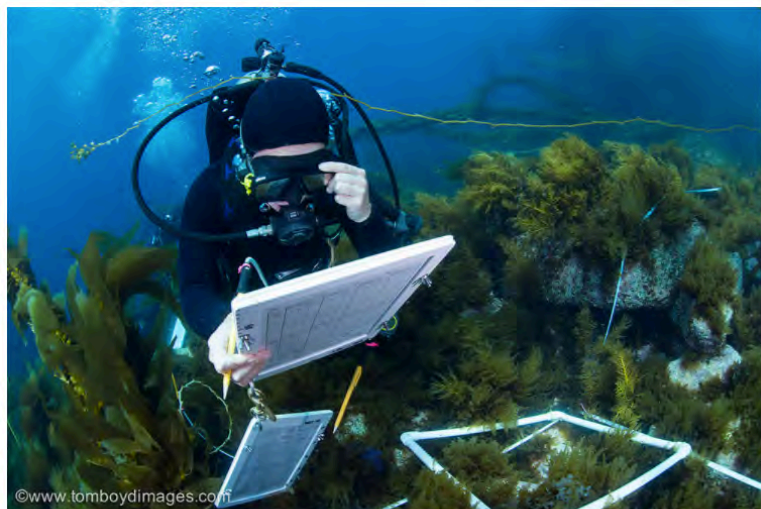
Montere Bay

<http://sanctuaries.noaa.gov/education>

Distance Learning



This webinar series provides information about education and outreach programs, products and curricular materials to bring the ocean into your classroom or facility to enhance ocean and climate literacy.



The Devil (Weed) is in the Details: The Spread and Ecology of an Invasive Seaweed

August 23, 2018 at 6 pm Eastern / 3 pm Pacific

Dr. Lindsay Marks, California Sea Grant Fellow for Channe
former Dr. Nancy Foster Scholar

Invasive species are the second-greatest driver of biodiversity loss. Invasive seaweeds represent a major challenge to ocean health. This presentation will focus on a Japanese seaweed called Devil Weed, which is rapidly spreading in southern California. Topics that will be discussed include: the ways in which it may affect native species; the role that it plays in resisting its spread; and techniques that can be used to control its spread.

[Register](#)



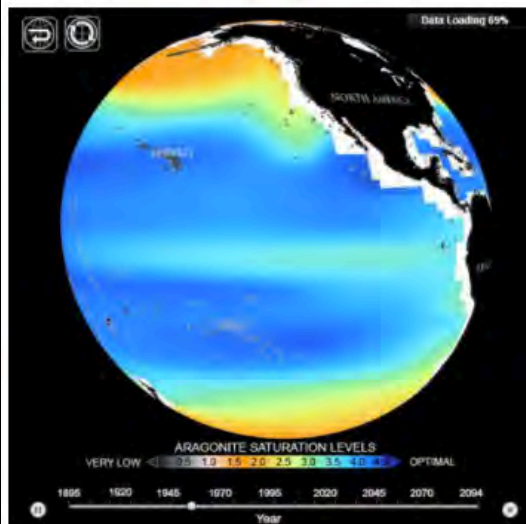
Plastics in the Ocean: Facts, Fiction, and Unknowns

September 25, 2018 at 6 pm Eastern / 3 pm Pacific

Anna Robuck, Dr. Nancy Foster Scholar at the University of Rhode Island Graduate School of Oceanography

Although plastics are vital in a slew of consumer applications, plastic pollution in the ocean has turned out to be a not-so-fantastic outcome of modern day plastic dependence. This presentation provides an overview of the ocean plastic pollution problem, explaining the difference between marine debris and microplastics. It also will outline the current state of knowledge about microplastic impacts in the ocean and marine food webs, and provide insight into an ongoing research project using seabirds as indicators of plastic pollution in the Northwest Atlantic.

[Register](#)



Understanding Ocean Acidification - Using NOAA's New Educational Tools

October 17, 2018 at 6 pm Eastern / 3 pm Pacific

Amy Dean, National Estuarine Research Reserve System

Data in the Classroom is designed to help teachers and students use real scientific data to explore dynamic Earth processes and understand the impact of environmental events on a regional and global scale. In this presentation, participants will dive deep into Data in the Classroom's Ocean Acidification Module to explore the processes that cause acidification, examine data from across the globe and take a virtual tour of the new web-based curricular modules and data tools.

[Register](#)



Listening to "See" Beneath the Waves: Soundscape monitoring in Channel Islands National Marine Sanctuary

April 9, 2019 at 3 pm Pacific / 6 pm Eastern

Dr. Lindsey Peavey Reeves, Research Specialist for NC Sanctuary

National marine sanctuaries are special places that support fishing, recreation, and commercial shipping. At the same time, they are home to diverse animal communities made up of some species that are relatively stationary. Like all marine environments, sanctuaries change with conditions and weather each year, like wind-driven upwellings. These elements have one thing in common: they produce sounds. While we cannot visually observe all, or even some of these things, and the waves to better understand and protect sanctuaries, passive acoustic monitoring has been a hot spot for passive acoustic monitoring for various ways in which the Channel Islands sanctuary soundscape, what we've been able to learn so far, and

[Register](#)



Protecting Blue Whales and Blue Skies – Vessel Speed Reduction in California

June 11, 2019 at 6 pm Eastern / 3 pm Pacific

Jessica Morten, Resource Protection Specialist, contractor to NOAA's Channel Islands National Marine Sanctuary & Cordell Bank National Marine Sanctuary through the Greater Farallones Association

California's nutrient-rich coastal waters are home to several species of large whales, including gray whales and endangered blue, humpback, and fin whales. The state is also home to four major shipping ports – San Diego, Long Beach, Los Angeles, and Oakland – that result in thousands of large container and tanker transits taking place within California national marine sanctuary waters. In the past decade, over 10 whale fatalities have been recorded along the California coast as a result of ship and whale collisions, and recent research suggests that many more of these ship strikes are going undetected each year. To address this global issue, national marine sanctuaries along the West Coast have been working with a number of partners to better understand the issue of ship strikes and slow vessels down to reduce harmful air emissions and protect endangered whales.

[Register](#)



Estimating Coral Feeding Habits from Space

May 21, 2019 at 6 pm Eastern / 3 pm Pacific

Dr. Michael Fox, Postdoctoral Scholar at Woods Hole Oceanographic Institution

Reef-building corals rely on a symbiosis with microscopic algae for much of their energetic needs. Rising ocean temperatures threaten this symbiosis and can cause it to break down in a process known as coral bleaching, which is one of the primary threats to the persistence of coral reef ecosystems globally. Corals are not helpless, however, as they are also excellent predators and if they can capture food to maintain their energy budgets while bleached they may have a greater chance for survival. Learn more how natural variation in food availability on reefs around the world and how this may influence coral resilience and recovery from bleaching events.

[Register](#)

NOAA Assets

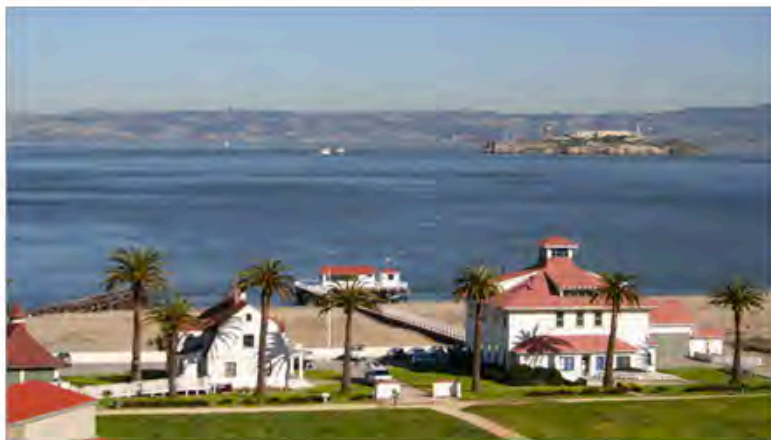


NOAA Assets

Coastal Discovery Center at San Simeon Bay



SANCTUARY EXPLORATION CENTER



Come enjoy a stunning view of the Golden Gate Bridge at the Greater Farallones National Marine Sanctuary Visitor Center! Located in a historic Coast Guard station at the mouth of San Francisco Bay, the center offers visitors a wealth of educational resources about wildlife and conservation, as well as access to a sandy beach and green space that's perfect for a sunny day trip.

Location: San Francisco, CA

Admission: Free

Hours: Wednesday – Sunday, 10 a.m. – 4 p.m.

Best for: Family picnics, birders, amateur photographers

Expeditions in National Marine Sanctuaries on Nautilus Live





NATIONAL MARINE SANCTUARIES MEDIA LIBRARY



OVERVIEW

The National Marine Sanctuaries Media Library is an online vault where a comprehensive collection of select video clips and still images from all 13 of the National Marine Sanctuaries is securely stored and available for searchable access.



Photos by Dean DePhillipo

QUICKSEARCH

ENTER KEYWORD

SELECT OPTIONS

☒ Images for Web

☒ Images for Print

☒ Video

All Categories ▾

All Subcategories ▾

All Sanctuaries ▾

[Search](#)

[Search Help](#)

PHOTO GALLERIES

SEA LION HIGHLIGHTS



SANCTUARY SUNSETS



HUMAN IMPACTS



FISH PORTRAITS



OCEAN FORESTS



SCENIC BEAUTY



Quicktime is required to view video on this site.

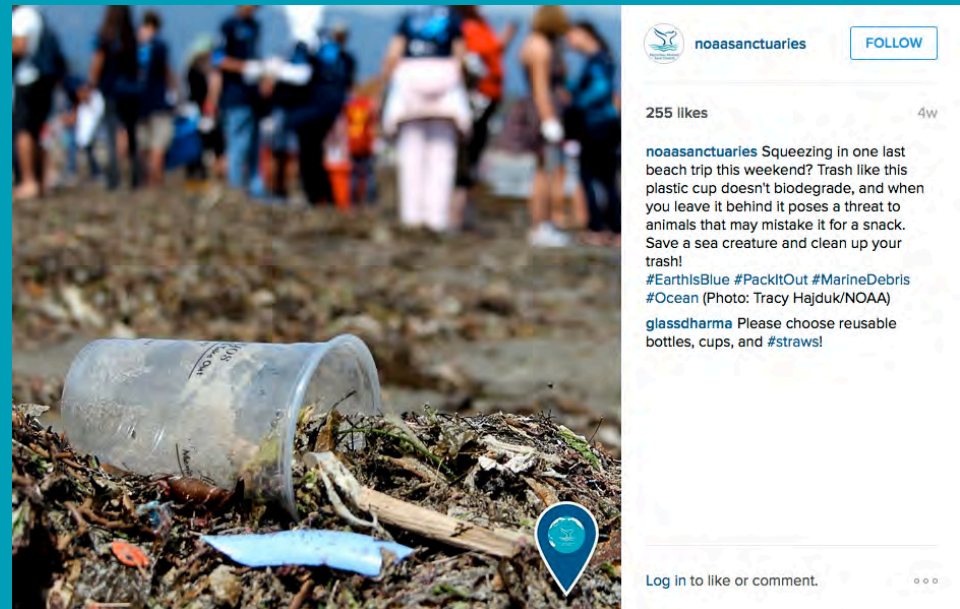
[User login](#) | [Administrative login](#)

<http://sanctuaries.noaa.gov/photos>

Social Media Earth is Blue Campaign



Photo by Bob Talbot





NOAA Office of National Marine Sanctuaries

Page Liked · August 11 ·

Heads up! The whale tagging boat in NOAA's Stellwagen Bank National Marine Sanctuary got a treat when this humpback whale breached right by them. Want to see whale tagging in action? Check out our video at <https://youtu.be/PdARpduN44g>. (Photo: NOAA/taken under NOAA Fisheries Permit #14245) #EarthIsBlue

Like · Comment · Share



Matt McIntosh, Nicole Capps and 2,992 others like this.

Most Relevant



3,787 shares



Stephen Young Fantastic shot, I would have been happier with less boat and more Whale, but it is all about right place, right time. Fantastic Shot.

Like · Reply · 16 · August 11 at 8:05am



NOAA Office of National Marine Sanctuaries

Thanks, Stephen! You can find more photos (including more whales!) at <http://sanctuaries.noaa.gov/earthisblue.html>.



Earth is Blue:
daily photos...

SANCTUARIES.N...

Like · Reply · 6 · August 11 at 8:19am



View more replies



Write a comment...



National Oceanic and
Atmospheric Administration
U.S. Department of Commerce

Satellite and Information Service

Data in the Classroom

[Home](#) [El Niño](#) [Sea Level](#) [Water Quality](#) [Coral Bleaching](#) [Ocean Acidification](#)

Put Big Ocean Data to Work in Your Classroom!

With NOAA's Data in the Classroom, students use real-time ocean data to explore today's most pressing environmental issues, and develop problem-solving skills employed by scientists. Access online and classroom-ready curriculum activities with a scaled approach to learning and easy-to-use data exploration tools.

El Niño

People blame El Niño for all kinds of abnormal weather. But how does El Niño really work?

Sea Level

Scientists know that global sea level is rising. But how are water levels monitored and measured to understand impacts?

Coral Bleaching

Coral reefs undergo bleaching when exposed to heat stress. But how do scientists measure and predict bleaching?

Water Quality

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

Ocean Acidification

Coming Soon - new, updated module resources, curriculum and data tools.

<http://dataintheclassroom.noaa.gov>

Level 1

Level 2

Level 3

Level 4

Level 5

Get Data

Teachers

Survey

El Niño

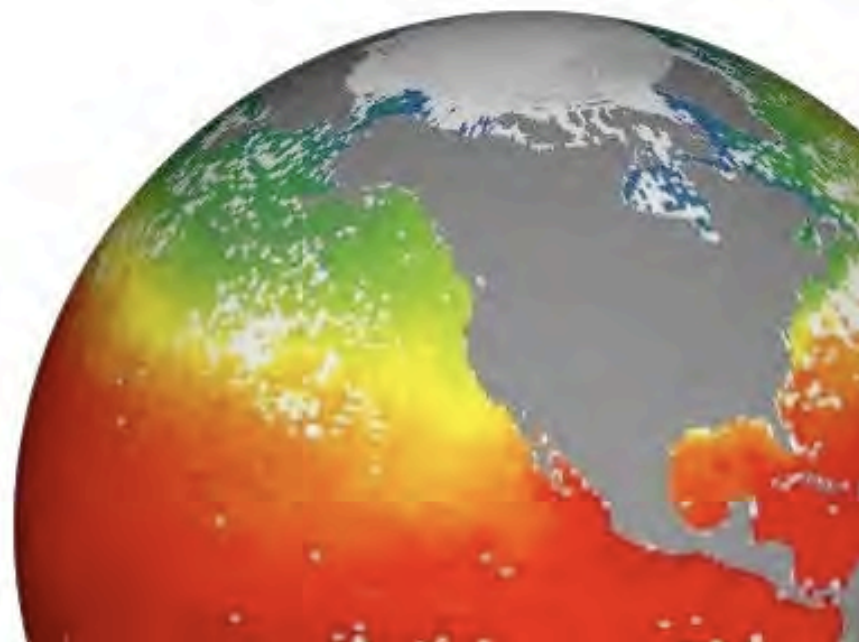
People blame El Niño for all kinds of abnormal weather. But how does El Niño really work?

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

Teachers: [start here](#) to download the curriculum guide.

Links

- [NOAA El Nino page](#)
- [The Integrated Ocean Observing System \(IOOS\)](#)
- [Science and the Sea: El Niño](#)

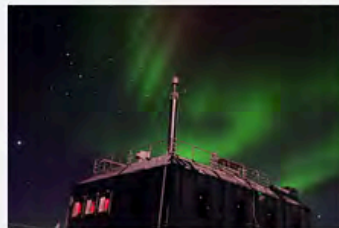


NOS Education

Building **ocean, coastal, and climate** literacy for students and educators.



NOS Education: Climate Stewards



<http://oceanservice.noaa.gov>

Sea Level Rise

This learning module is a cooperative effort between NASA's Jet Propulsion Laboratory and NOAA's National Ocean Service. It informs about sea level rise, its causes, and impacts; and challenges students to think about what they can do in response. This module features an integrated educational package of grade level-appropriate (6-12) instruction and activities centered on a 23-minute video presentation. Note that the video has scheduled pauses so educators may facilitate discussions of presented topics. Discussions will extend the total viewing time of the video.



Sea level rise module video. Scroll Down for Focus Question, [5E Learning Objectives](#), and [NGSS \(Next Generation Science Standards\)](#) Alignment.

Focus Question: What is causing sea level rise and what can be done about it?

Pre-Video Viewing Activities

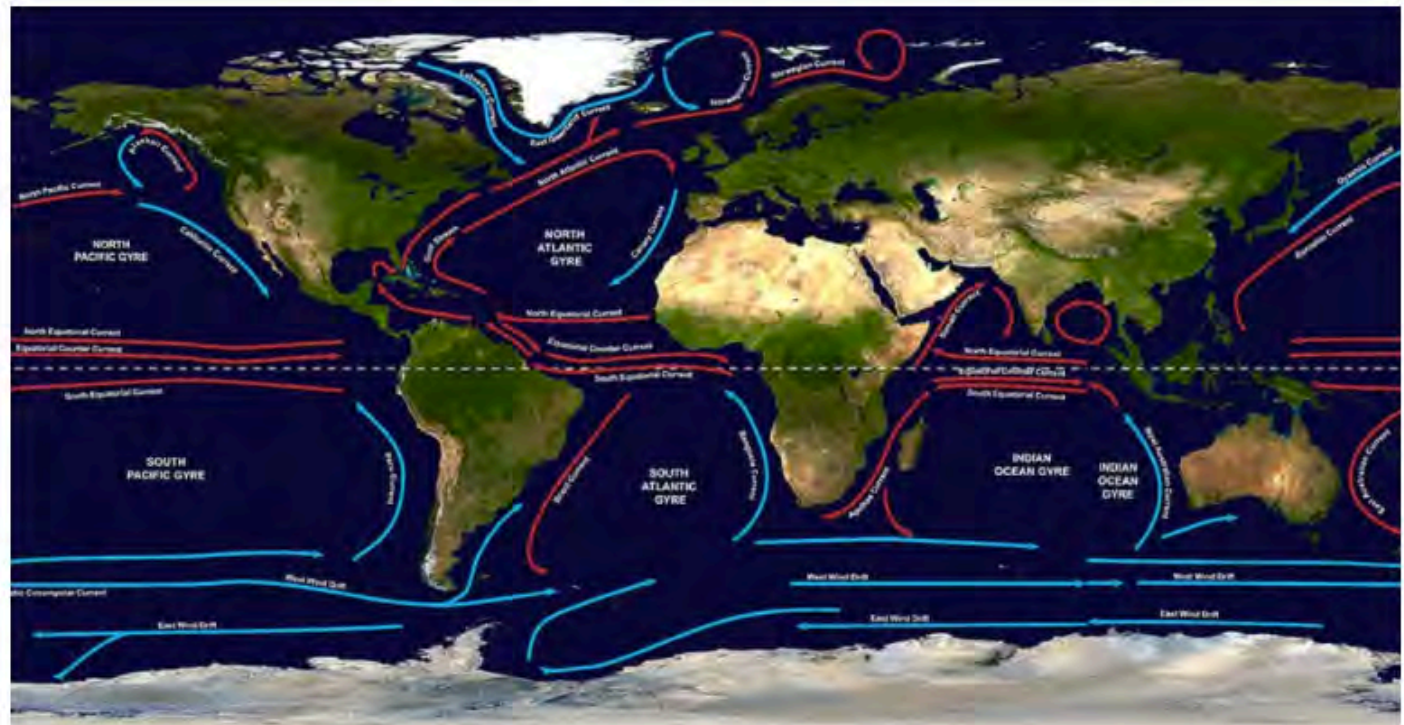
- [Sea Level Rise Module Guide for Educators](#)



[HOME](#) * [OCEAN FACTS](#) * [WHAT IS A GYRE?](#)

What is a gyre?

A gyre is a large system of **rotating ocean currents**.

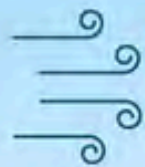


There are five major gyres, which are large systems of rotating ocean currents. The ocean churns up various types of currents. Together, these larger and more permanent currents make up the systems of currents known as gyres.

OUR WORLD OCEAN

provides

THE AIR WE BREATHE



>50% The ocean produces over half of the world's oxygen and stores 50 times more carbon dioxide than our atmosphere.

CLIMATE REGULATION

70% Covering 70% of the Earth's surface, the ocean transports heat from the equator to the poles, regulating our climate and weather patterns.



TRANSPORTATION



76% Percent of all U.S. trade involving some form of marine transportation.

RECREATION



From fishing to boating to kayaking and whale watching, the ocean provides us with so many unique activities.

ECONOMY



\$282 billion Amount the U.S. ocean economy produces in goods and services. Ocean-dependent businesses employ almost 3 million people.

FOOD

The ocean provides much more than just seafood. Ingredients from the sea are found in surprising foods such as peanut butter and soymilk.



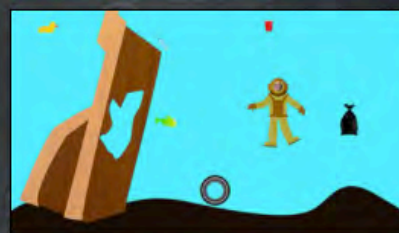
MEDICINE

Many medicinal products come from the ocean, including ingredients that help fight cancer, arthritis, Alzheimer's disease, and heart disease.

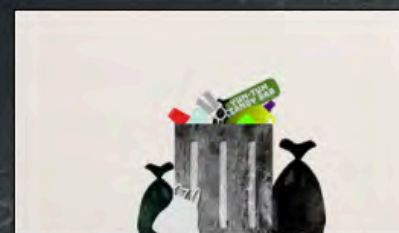




TRASH TALK
(INTRODUCTION)



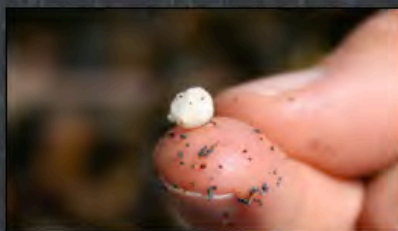
WHAT IS MARINE DEBRIS?
(PART 1)



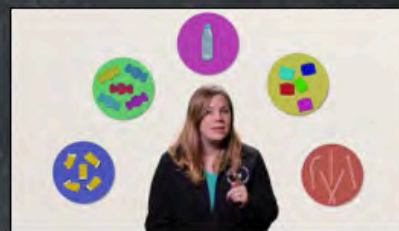
WHERE DOES MARINE DEBRIS
COME FROM?
(PART 2)



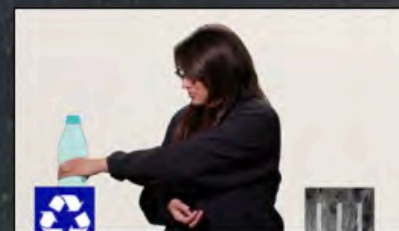
IMPACTS OF MARINE DEBRIS
(PART 3)



WHAT IS THE GREAT PACIFIC
GARBAGE PATCH?
(PART 4)



MARINE DEBRIS AND PLASTICS
(PART 5)



WHAT CAN WE DO?
(PART 6)



HANDS-ON ACTIVITY DEMO
(PART 7)



TRASH TALK SPECIAL FEATURE
(BONUS 1)



SEA TURTLE RESCUE UN-CUT
FOOTAGE
(BONUS 2)



ATTENTION GETTER STILL IMAGE
(BONUS 3)

Ocean Today Videos



National Oceanic and Atmospheric
Administration
U.S. Department of Commerce

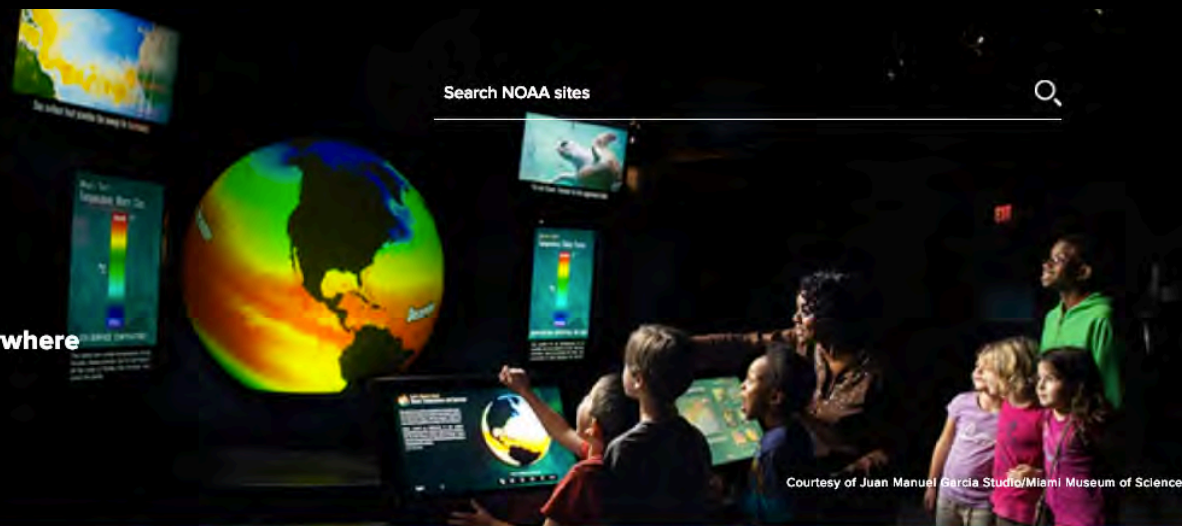
OUR WORK

Search NOAA sites



Education

Educators, students, and curious people everywhere
— come explore the ocean and atmosphere.



Courtesy of Juan Manuel Garcia Studio/Miami Museum of Science

Resource Collections

Educator Opportunities

Student Opportunities

Grants & Networks

STORIES //

**NOAA undergraduate
scholars
#TakeoverTuesday to
promote the 2019
application season**



[View all >](#)

NEWS //

**Meet the NOAA
employees recognized
at the 2019 Black
Engineer of the Year
Awards**



[View all >](#)

HELPFUL LINKS //

[Office of Education >](#)

[NOAA in your backyard: Education
contacts near you >](#)

[Data resources for educators >](#)

[Show more ▾](#)

<http://education.noaa.gov>



Resource collections

Resources to help integrate NOAA science into formal ar

Education resources are distributed across many websites and program offices at NOAA and partner websites. This portal is designed to help you access these resources from one location. Materials are organized by themes aligned with common teaching topics. [Learn more](#) about how we designed these collections.

Ocean & coasts

Physical and chemical processes of ocean and coastal areas.

- [Gulf oil spill](#)
- [Ocean acidification](#)
- [Ocean currents](#)
- [Ocean floor features](#)
- [Ocean pollution](#)
- [Tides](#)
- [Tsunamis](#)

Weather & atmosphere

Earth's climate system and concepts related to climate variability.

- [El Niño](#)
- [Hurricanes](#)

Climate

Earth's climate system and concepts related to climate variability.

- [Carbon cycle](#)
- [Changing seasons](#)
- [Climate change impacts](#)
- [Climate monitoring](#)

Marine life

Biology, habits, and threats to organisms that live in aquatic environments.

- [Aquatic food webs](#)
- [Coral reef ecosystems](#)
- [Life in an estuary](#)
- [Marine mammals](#)
- [Sea turtles](#)

Freshwater

Sources, processes, and threats to freshwater environments and drinking water.

- [Great Lakes ecoregion](#)
- [Water cycle](#)
- [Watersheds, flooding & pollution](#)

Elementary science

Bring NOAA resources to your kindergarten through fifth-grade students.

- [Earth science](#)
- [Life science](#)
- [NOAA careers](#)
- [Physical science](#)
- [Scientific process](#)



Ocean pollution

Each year, billions of pounds of trash and other pollutants enter the ocean.

[Education](#) | [ocean education](#) [marine debris](#)

Where does this pollution come from? Where do pollutants end up? On beaches, washed in with the waves and tides, that mistake it for food, and some accumulates. Some impact the health of the ocean come from a single source, such as a spill, or accumulation of many dispersed sources, such as runoff from farms.

The majority of pollutants going into the ocean come from activities on land. Natural processes and human activities along the coastlines and far inland affect the health of our ocean. One of the biggest sources is called **nonpoint source pollution**, which occurs as a result of runoff. Nonpoint source pollution includes many small sources, like septic tanks, cars, trucks, and boats, plus larger sources, such as farms, livestock ranches, and timber harvest areas. Pollution that comes from a single source, like an oil or chemical spill, is known as **point source pollution**. Often these events have large impacts, but fortunately, they occur less often. Discharge from faulty or damaged factories or water treatment systems is also considered point source pollution.



Beach cleanups help keep microplastics out of the garbage patches

These days plastic seems to be everywhere; unfortunately, that includes many parts of the ocean...

[Read more >](#)

Nutrients and algal blooms

Sometimes it is not the type of material, but its concentration that determines whether it is a pollutant. For example, the nutrients nitrogen and phosphorus are essential elements for plant growth. However, if they are too abundant in a body of water, they can stimulate an overgrowth of algae, triggering an event called an **algal bloom**. Some algal blooms can be harmful to humans or marine life. Excess nutrients entering a body of water, either through natural or human activities, can also result in **hypoxic or dead zones**. When large amounts of algae sink and decompose in the water, the decomposition process consumes oxygen and depletes the supply available to healthy marine life. Most of the marine species that live in these areas

LESSONS & ACTIVITIES

[Lessons and activities from NOAA Marine Debris \(ES, MS, HS\) >](#)

[Winged Ambassadors: Plastic pollution through the eyes of albatross \(MS, HS\) >](#)

[The Oil Spill: The rest of the story \(MS, HS\) >](#)

[Show more >](#)

MULTIMEDIA

[Video: Regional Emmy® Award-Winning TRASH TALK \(15 min\) >](#)

[Podcast: Garbage Patches: How Gyres Take Our Trash Out to Sea \(10 min\) >](#)

[Video: Students offer solutions to marine debris problems in Great Lakes \(6 min\) >](#)

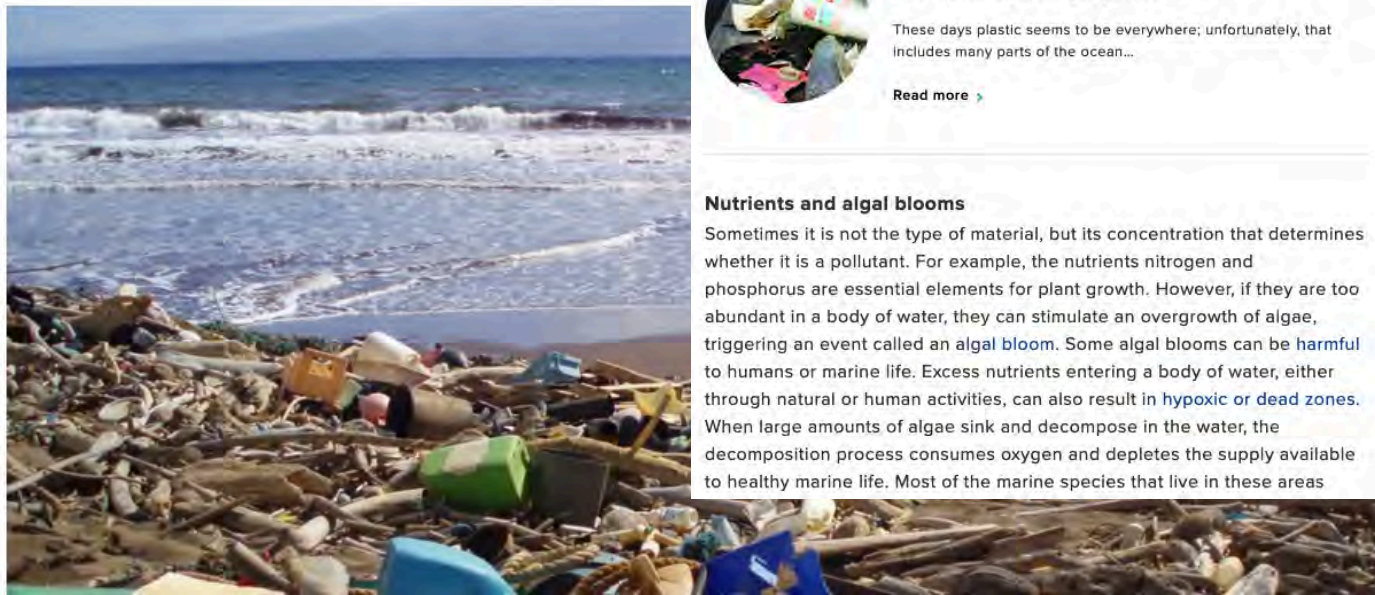
[Show more >](#)

REAL WORLD DATA

[Pollution incident map >](#)

[Marine Debris Tracker >](#)

[Ocean sound pollution maps >](#)



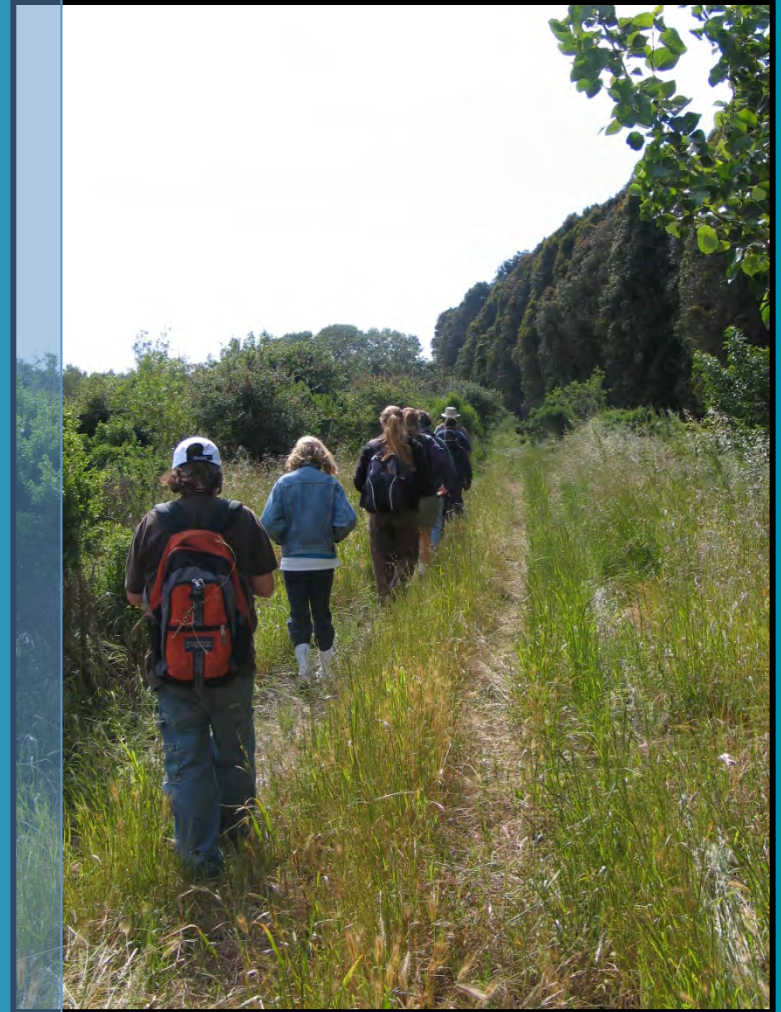
Priorities

- PRIORITY 1- MWEE Implementation in School Districts (Professional development for teachers and student experiences)
- PRIORITY 2- MWEEs for Students
- PRIORITY 3- Teacher Professional Development for MWEEs



Eligible applicants

- Schools and school systems
- State organizations
- Institutions of higher education
- Non-profit
- State and county agencies



Geographic boundaries

Monterey Bay watershed—the counties of San Mateo, Santa Cruz, Santa Clara, Monterey, San Benito, and San Luis Obispo

San Francisco Bay watershed—the counties of Marin, San Francisco, Alameda, Contra Costa, Sonoma, Mendocino, Humboldt, Del Norte, Trinity, Napa and Santa Rosa

Santa Barbara Channel watershed—the counties of Santa Barbara and Ventura



How Much/How Long

- Up to \$950,000
 - \$400,000 San Francisco Bay area
 - \$325,000 Monterey Bay area
 - \$225,000 Santa Barbara area
- Priority 1- Up to \$100,000 for up to three years
- Priority 2 and 3- Up to \$60,000 one year , with renewal
- Funds will cover staff time, bus transportation and equipment



Application Package

- Content
- Budget
- Evaluation



How to Apply

- Required forms and components of the grant (FFO)
- Register with Grants.gov
- Register with SAM
- Talk to me!



Timeline

- Due April 5, 2019
 - Award notices
 - Unsuccessful notifications
- Start date- August 1, 2019
 - Priority 1- August 1, 2019- July 31, 2022)
 - Priority 2 and 3- August 1, 2019- July 31, 2020



Review Process

- Preliminary review
- Technical review
- Panel review
- Check the evaluation criteria!



How to Write a Grant

- Is it a good match?
- Is there a need?
- Grant writing tips



Questions

- Claire.Fackler@noaa.gov
- Seaberry.Nachbar@noaa.gov
- Leslye.Fulwider@noaa.gov

