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please email [education@noaa.gov](mailto:education@noaa.gov)

# Building connections between NOAA and environmental educators

Bekkah Lampe (she/her) & Kayla do Couto (she/her)  
NOAA Office of Education  
[education@noaa.gov](mailto:education@noaa.gov)

NAAEE - October 13, 2022

# Who are we? Bekkah Lampe

- Joined NOAA Office of Education (Silver Spring, MD) in 2018
  - Outreach and Education Coordinator
- Formal education in biology
  - Bachelor's in Biology – University of Maryland, Baltimore County
  - Master's in Ecology, Evolution, & Marine Bio – UC Santa Barbara
- Prior to NOAA: informal educator for 10+ years



# Who are we? Kayla do Couto

- Joined NOAA Office of Education (Silver Spring, MD) in 2018
  - Social Media Manager, Communication Specialist
- Formal education in marine science and communications
  - Bachelor's in Marine Science – Coastal Carolina University
  - Master's in Strategic Communications – University of Maryland Global Campus
- Background in marine science and informal education
  - I've worked at aquariums, museums, and science summer camps



# Who are you?

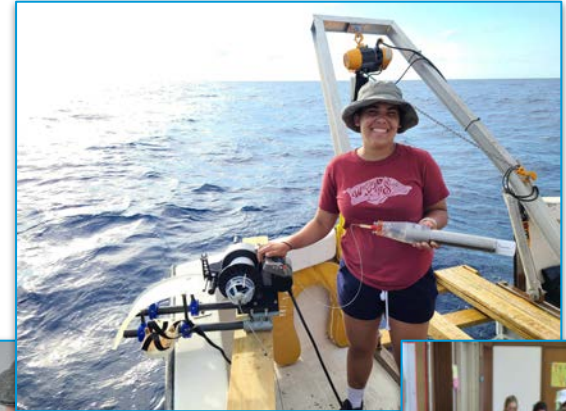
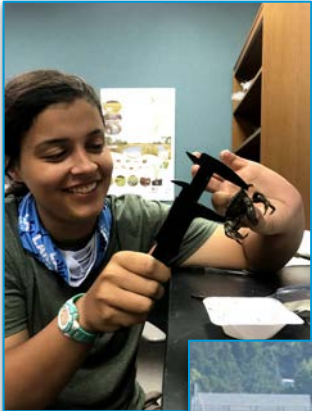
- Have you heard of NOAA before this conference?
- Have you ever worked with NOAA before? (grantee, site visit, used resources, used data, etc.)
- What kind of organization or institution do you work for?
- Where are you based?

# What is NOAA?

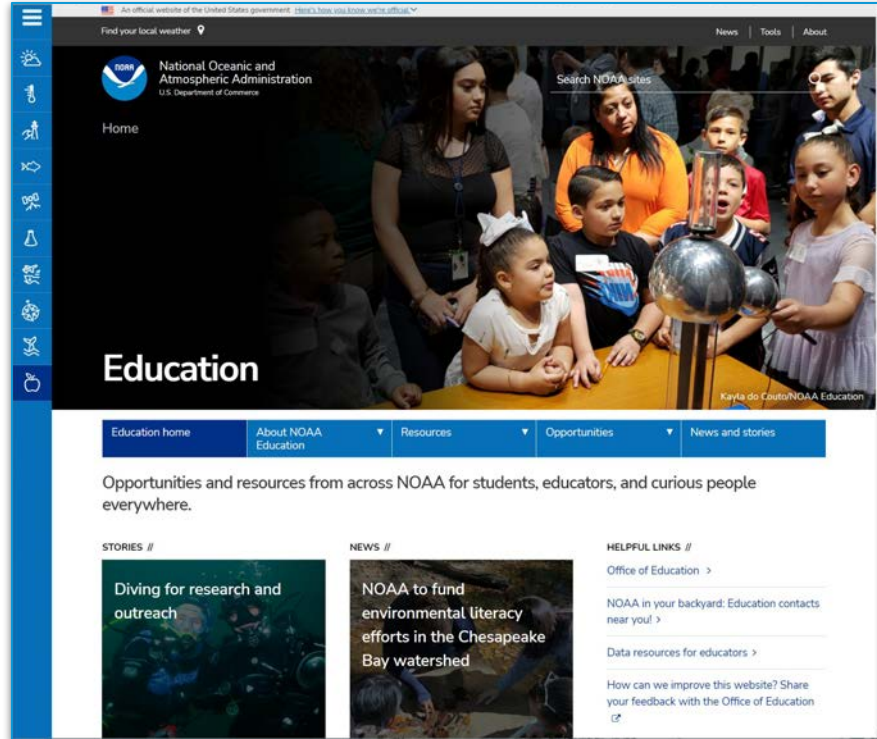
- National Oceanic and Atmospheric Administration (NOAA)
- Mission: **Science, Service, Stewardship**
- Focus areas:
  - Protecting life and property from weather
  - Protecting fisheries and marine life
  - Studying and exploring the planet
  - Collecting and sharing Earth science data
  - Modeling climate data
  - Mapping our waters
  - Conserving natural resources
  - Protecting the ocean, the Great Lakes, and our coasts
  - Educating people on NOAA's unique science, places, products, and services



# NOAA Education



# NOAA education portal: [noaa.gov/education](https://noaa.gov/education)



*Opportunities and resources from across NOAA for students, educators, and curious people everywhere.*

# Connect with NOAA

The screenshot shows the NOAA Education website interface. At the top, there is a navigation bar with a hamburger menu icon, a weather search bar, and links for News, Tools, and About. The main header features the NOAA logo and the text "National Oceanic and Atmospheric Administration U.S. Department of Commerce". Below this is a large image of children gathered around a table with a science experiment, with the text "Education" overlaid. A search bar labeled "Search NOAA sites" is positioned above the image. A blue navigation bar at the bottom contains several menu items: "Education home", "About NOAA Education", "Resources", "Opportunities", and "News and stories". The "About NOAA Education" menu is expanded, showing sub-items: "Connect with us", "Archives", and "NOAA in your backyard: Education contacts near you". The "Opportunities" menu is also expanded, showing the text "Opportunities and resources for students, educators, and curious people everywhere." Below the navigation bar, there are sections for "STORIES //", "HELPFUL LINKS //", and a "NOAA in your backyard" search box.



Pinned Tweet



NOAA Education  
@NOAAeducation

Heading back to school? Our new tool makes it easier than ever to include @NOAA resources in your classroom! Explore our education database and find our #BackToSchoolNOAA favorites: [noaa.gov/education/back...](https://noaa.gov/education/back...)

#BackToSchool2022 @NOAAResearch @NOAASatellites @NWS @noaaocan



noaa.gov

Go back to school with NOAA

With a new school year just around the corner, teachers and educators are gearing up to create lesson plans and find engaging activities for their students...

2:16 PM · Aug 17, 2022 · Twitter Web App



31 days of #NOAASpookyScience



# NOAA in [noaa.gov](https://noaa.gov)

**NOAA in your  
area.**  
Get connected to NOAA  
your area.



## NOAA in your backyard: Southwest

Educational opportunities and staff in Arizona, Nevada, New Mexico, Utah, and southern California

Share: [Twitter](#) [Facebook](#) [Email](#) [Print](#)

### NOAA in Your State & Territory

State by state listings of NOAA facilities and programs

A summary of NOAA facilities, staff, programs, or activities based in, or focused on, your state or territory.

- Arizona
- California
- Nevada
- New Mexico
- Utah

### National Weather Service

School visits • Forecast office tours • Student and educator resources

The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas.

- To find your local Weather Forecast Office (WFO), visit the [National Weather Service local contact page](#) and click on your state. There will be a name, email address, and phone number for the WFO that serves your area.
- Visit [weather.gov](https://www.weather.gov) and enter your zip code to find your local WFO.

### National Estuarine Research Reserve System

Field trips • Professional development • Educator resources

The National Estuarine Research Reserves System protects more than 1.3 million coastal and estuarine acres in 29 reserves located in 23 states and Puerto Rico for purposes of long-term research, environmental monitoring, education and stewardship.

- [Tijuana River Reserve \(CA\)](#) ↗ – Anne Marie Tipton, Education Coordinator: [annemarie.tipton@parks.ca.gov](mailto:annemarie.tipton@parks.ca.gov)
- [Elkhorn Slough Reserve \(CA\)](#) ↗ – Virginia Guhin, Education Coordinator: [Virginia.Guhin@wildlife.ca.gov](mailto:Virginia.Guhin@wildlife.ca.gov)

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

# yard

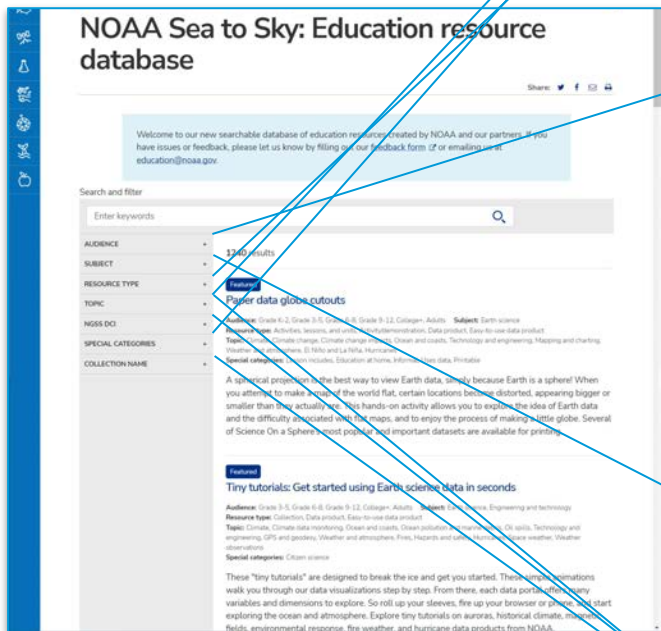
s across the  
country that

# NOAA education resources

The screenshot shows the NOAA Education website interface. At the top, there is a navigation bar with icons for a magnifying glass, a leaf, and an apple. The main header area features the word "Education" in large white text on a dark background, with a photo of children at a table and the text "Kayla do Couto/NOAA Education". Below the header is a blue navigation menu with the following items: "Education home", "About NOAA Education" (with a dropdown arrow), "Resources" (with an up arrow), "Opportunities" (with a dropdown arrow), and "News and stories". A dropdown menu is open under "Resources", listing: "NOAA Sea to Sky: Education resource database", "Resource collections: Browse by topic" (with a link icon), "Ocean and coasts" (with a dropdown arrow), "Weather and atmosphere" (with a dropdown arrow), "Climate" (with a dropdown arrow), "Marine life" (with a dropdown arrow), "Freshwater" (with a dropdown arrow), and "More collections" (with a dropdown arrow). Below the navigation menu, the main content area includes the text "Opportunities and resources from across the country and curious people everywhere." and "STORIES //". There are two story cards: one titled "Diving for research and outreach" with an underwater image, and another titled "NOAA environmental effort Chesapeake watershed" with a photo of a person. A "NEWS //" section is also visible. At the bottom of the page, there is a footer with the text "How can we improve this website? Share" and a social media icon.

# NOAA Sea to Sky: Education resource database

[noaa.gov/education/resources](https://noaa.gov/education/resources)



## SPECIAL CATEGORIES

- 3D printable (4)
- Citizen science (37)
- Cultural heritage (42)
- Grantee resource (12)
- Lesson includes (218)
  - Education at home (67)
  - Hands-on (132)
  - Informal (110)
  - Inquiry (22)
  - Models (107)
  - Outdoor education (39)
  - Project-based (13)
  - STEM (6)
  - Uses data (62)
- Other languages (184) +
- Printable (69)
- Region (32) +
- Safety/preparedness (103)
- Scientists in action (5)

# NOAA education resource collections (browse)

## [noaa.gov/education/resource-collections](https://noaa.gov/education/resource-collections)

The screenshot displays the NOAA Education Resource Collections website. The main heading is "Resource collections" with a sub-heading "Resources to help integrate NOAA science into formal and informal education." Below this, there is a section for "NEW! NOAA Sea to Sky: Education resource database" which encourages searching through hundreds of free educational resources. The page is organized into several thematic sections, each with a list of resources and a representative image:

- CLIMATE #**: Earth's climate system and concepts related to climate variability. Resources include: Carbon cycle, Changing seasons, Climate change impacts, and Climate data monitoring. Image: A globe showing temperature anomalies.
- MARINE LIFE #**: Biology, habits, and threats to organisms that live in aquatic environments. Resources include: Aquatic food webs, Coral reef ecosystems, Fisheries and seafood, Life in an estuary, Marine mammals, and Sea turtles. Image: A group of people looking at a large marine specimen.
- FRESHWATER #**: Sources, processes, and threats to freshwater environments and drinking water. Resources include: Great Lakes ecosystem, Water cycle, and Watersheds, flooding, and pollution. Image: A close-up of water splashing.
- ELEMENTARY SCIENCE #**: Bring NOAA resources to your kindergarten through fifth-grade students. Resources include: Earth science, Life science, NOAA careers, Physical science, and Scientific process. Image: A group of children in blue shirts holding up a model.
- OCEAN AND COASTS #**: Physical and chemical processes of oceans and coastal areas. Resources include: Ocean acidification, Ocean currents, Ocean floor features, Ocean pollution and marine debris, Oil spills, Tides, and Tsunamis. Image: A large wave crashing.
- WEATHER AND ATMOSPHERE #**: Earth's climate system and concepts related to climate variability. Resources include: El Niño and La Niña, Hurricanes, Space weather, Tornadoes, Weather observations, and Weather systems and patterns. Image: A close-up of a white, fluffy cloud.
- DATA RESOURCES FOR EDUCATORS #**: Lesson plans featuring NOAA data, as well as real-time and historical data in a variety of formats. Resources include: Classroom-ready data resources, Climate data resources, Historical data resources, Ocean and freshwater data resources, Real-time data resources, Weather and atmosphere data resources, Tiny tutorials: Get started with Earth science data in seconds, and How to use NOAA data: A video guide for educators. Image: A colorful satellite image of a coastal region.
- EDUCATION AT HOME #**: A special collection of materials for anyone working with students at home: Distance learning educators, homeschool teachers, and parents. Resources include: Art activities, Background reading, Citizen science, Experiments and activities, Lessons and curricula, Mailing lists, Mobile resources, Upcoming and archived webinars, and Videos and podcasts. Image: A person reading a book outdoors.
- SPECIAL TOPICS #**: Resources include: Career resources, Hands-on science activities, Technology and engineering resources, 2022 Science Olympiad: Freshwater hydrology, and 2022 Science Olympiad: Meteorology. Image: A person holding a model of a structure.

# Topical resource collection example

## Climate change impacts

Focus areas: Education Topics: climate literacy, climate impacts, education

Share: [Twitter](#) [Facebook](#) [Email](#) [Print](#)

Though we often think about [human-induced climate change](#) as something that will happen in the future, it is an ongoing process. Ecosystems and communities in the United States and around the world are being impacted today.



A collage of typical climate and weather-related events: floods, heatwaves, drought, hurricanes, wildfires and loss of glacial ice. (NOAA)

Global temperatures rose about 1.98°F (1.1°C) from 1901 to 2020, but climate change refers to more than an increase in temperature. It also includes sea level rise, changes in weather patterns like drought and flooding, and much more. Things that we depend upon and value — water, energy, transportation, wildlife, agriculture, ecosystems, and human health — are experiencing the effects of a changing climate.

### SEA TO SKY: EDUCATION RESOURCE DATABASE //

**NEW!** Find even more resources on climate change impacts in our searchable resource database.

### LESSON PLANS & ACTIVITIES //

[Climate Resilience in Your Community activity book \(ES, MS, HS\)](#) >

[Data in the Classroom \(MS/HS\)](#) >

[HEART Force: Colorado environmental hazards collection](#) [external link](#)

[Sea level rise learning module \(MS/HS\)](#)

[Hands-on climate science activities \(MS/HS\)](#) >

[Earth science lessons and activities \(MS/HS\)](#) >

### MULTIMEDIA //

[Ocean Today: Climate Alive! \(video series\)](#)

[Arctic report card 2020 \(video\)](#) >

### A complex issue

The impacts of climate change on different sectors of society are interrelated. Drought can harm food production and human health. Flooding can lead to disease spread and damages to ecosystems and infrastructure. Human health issues can increase mortality, impact food availability, and limit worker productivity. Climate change impacts are seen throughout every aspect of the world we live in. However, climate change impacts are uneven across the country and the world — even within a single community, climate change impacts can differ between neighborhoods or individuals. Long-standing socioeconomic inequities can make underserved groups, who often have the highest exposure to hazards and the fewest resources to respond, more vulnerable.

The projections of a climate change-impacted future are not inevitable. Many of the problems and solutions [are known to us now](#), and ongoing research continues to provide new ones. Experts believe there is still time to avoid the most negative of outcomes by [limiting warming](#) [and reducing emissions to zero as quickly as possible](#). Reducing our emissions of greenhouse gases will require investment in new technology and infrastructure, which will spur job growth. Additionally, lowering emissions will lessen harmful impacts to human health, saving countless lives and billions of dollars in health-related expenses.



### Despite pandemic shutdowns, carbon dioxide and methane surged in 2020

Levels of the two most important anthropogenic greenhouse gases, carbon dioxide and methane, continued their unrelenting rise in 2020 despite the economic slowdown caused by the coronavirus pandemic response.

### Our changing climate

We see climate change affecting our planet from pole to pole. NOAA monitors global climate data and here are some of the changes NOAA has recorded. You can explore more at the [Global Climate Dashboard](#).

- Global temperatures rose about 1.8°F (1°C) from 1901 to 2020.
- Sea level rise has accelerated from 1.7 mm/year throughout most of the twentieth century to 3.2 mm/year since 1993.
- Glaciers are shrinking: average thickness of 30 well-studied glaciers has decreased more than 60 feet since 1980.
- The area covered by sea ice in the Arctic at the end of summer has shrunk by about 40% since

[The first glacier in the ocean \(video\)](#) >

[Climate change in Alaska \(videos\)](#) >

[Ocean acidification and shellfish farming \(video\)](#) >

[Understanding the marine heatwaves in the Pacific Northwest \(60 minute webinar\)](#) >

[Managing national marine sanctuaries in a changing ocean \(60 minute webinar\)](#) >

[Communicating climate change: Resources for making it stick \(60 minute webinar\)](#) >

### DATA RESOURCES //

[The Climate Explorer: Climate data and projections](#) [external link](#)

[U.S. Climate Resilience Toolkit](#) >

[Climate at a glance: Temperature, precipitation, and other weather data](#) >

[Drought data and projections](#) [external link](#)

[Sea level trends](#) >

[Impacts on marine species distribution](#) [external link](#)

[U.S. Drought Portal: maps, data and forecasts](#) >

[Snow and Ice Data for Google Earth](#) [external link](#)

[Sea ice: interactive maps](#) [external link](#)

### BACKGROUND INFORMATION //

[National climate assessment](#) >

[U.S. climate resilience toolkit](#) >

# NOAA citizen science

- As citizen scientists, your audiences can participate in the scientific process, addressing real-world problems
- They may:
  - Collect and analyze data
  - Formulate research questions
  - Conduct scientific experiments
  - Interpret results
  - Make new discoveries
  - Develop technologies and applications
  - Solve complex problems

*Modified from <https://www.citizenscience.gov/>*

- “Citizen science” = “community science” or “community-based science”

# NOAA citizen science

- NOAA supports 60+ citizen science projects
- In 2019:
  - Over 550,000 participants
  - Over 16 million observations
  - Over 1.2 million volunteer hours
- Find projects at <https://www.citizenscience.gov/> and select NOAA in the “View by Agency” field
- Suggested projects: [noaa.gov/work-with-us/volunteer-opportunities-citizen-scientists](https://noaa.gov/work-with-us/volunteer-opportunities-citizen-scientists)





# NOAA citizen science

**RESOURCE TYPE**

- Citizen science project (14)
- Activities, lessons, and units (216)
- Arts and crafts (4)
- Background information (235)
- Career profile (86)
- Collection (169)
- Coloring/activity book (34)
- Contest (4)
- Data product (165)
- Job seeker resource (13)
- Multimedia (529)
- Poster/brochure (26)
- Related story (157)

Enter keywords

**AUDIENCE** + Citizen science project

**SUBJECT** +

**RESOURCE TYPE** -

- Citizen science project (14)
- Activities, lessons, and units (216)
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**TOPIC** +

**NGSS DCI** +

**SPECIAL CATEGORIES** +

**COLLECTION NAME** +

**14 results**

**CrowdMag**

**Audience:** Adults, College+, Grade 9-12, Grade 6-8 **Subject:** Engineering and technology  
**Resource type:** Citizen science project, Mobile app, Multimedia **Topic:** Technology and engineering, GPS and geodesy  
**Special categories:** Citizen science

When you go outside and are moving around, use CrowdMag to measure the magnetic data along your path. Save, list, export or delete data to create a complete magnetic field map of your area. Share your data with a research group at NOAA. Multiple recordings along the same path are very helpful to reduce the noise and produce a more accurate magnetic field map. Get started with a tiny tutorial!  
<https://www.noaa.gov/education/resource-collections/data/tiny-tutorials/crowdmag>

**Marine Debris Monitoring and Assessment Project Fact Sheet**

**Audience:** Adults, College+, Grade 9-12 **Subject:** Math, Earth science **Resource type:** Citizen science project, Background information  
**Topic:** Ocean and coasts, Ocean pollution and marine debris **Special categories:** Citizen science

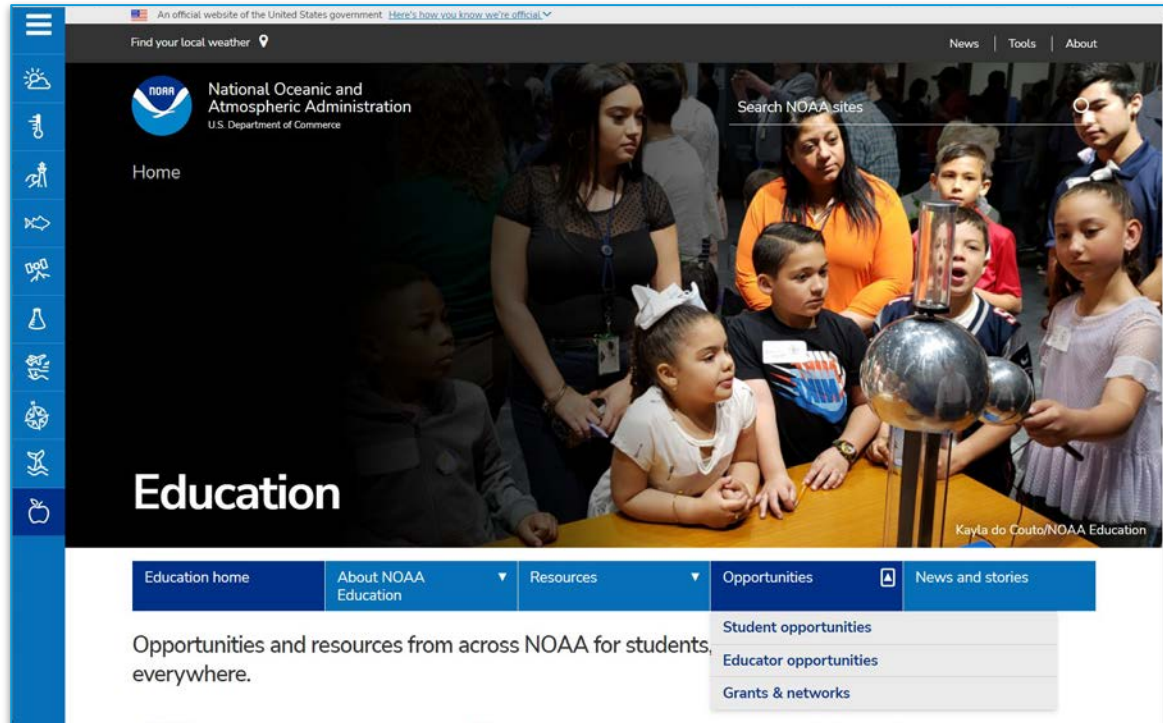
Learn more about the NOAA Marine Debris Program's Marine Debris Monitoring and Assessment Project, or MDMAP, which is a citizen science initiative that engages NOAA partners and volunteers across the nation to survey and record the amount and types of marine debris on shorelines.

**FISHtory**

**Audience:** Adults, College+, Grade 9-12 **Subject:** Social Studies, Life science **Resource type:** Citizen science project  
**Topic:** Marine life, Fish, Fisheries and seafood **Special categories:** Citizen science, Cultural heritage

The FISHtory Project has two ways to help collect information from historic dock photos. FISH & PEOPLE: Count is an easier project where you can mark the number of fish and people in a photo. FISH: Classify is a more challenging project where you can identify four common species using a draw tool. After the common fish are marked, you will be given a list of less common fish and asked to identify the remaining fish in the photo. If you're not a fish expert, don't worry! All skill levels are welcomed and encouraged to use a given field guide to help identify fish and provide your best guess.

# NOAA opportunities and grants



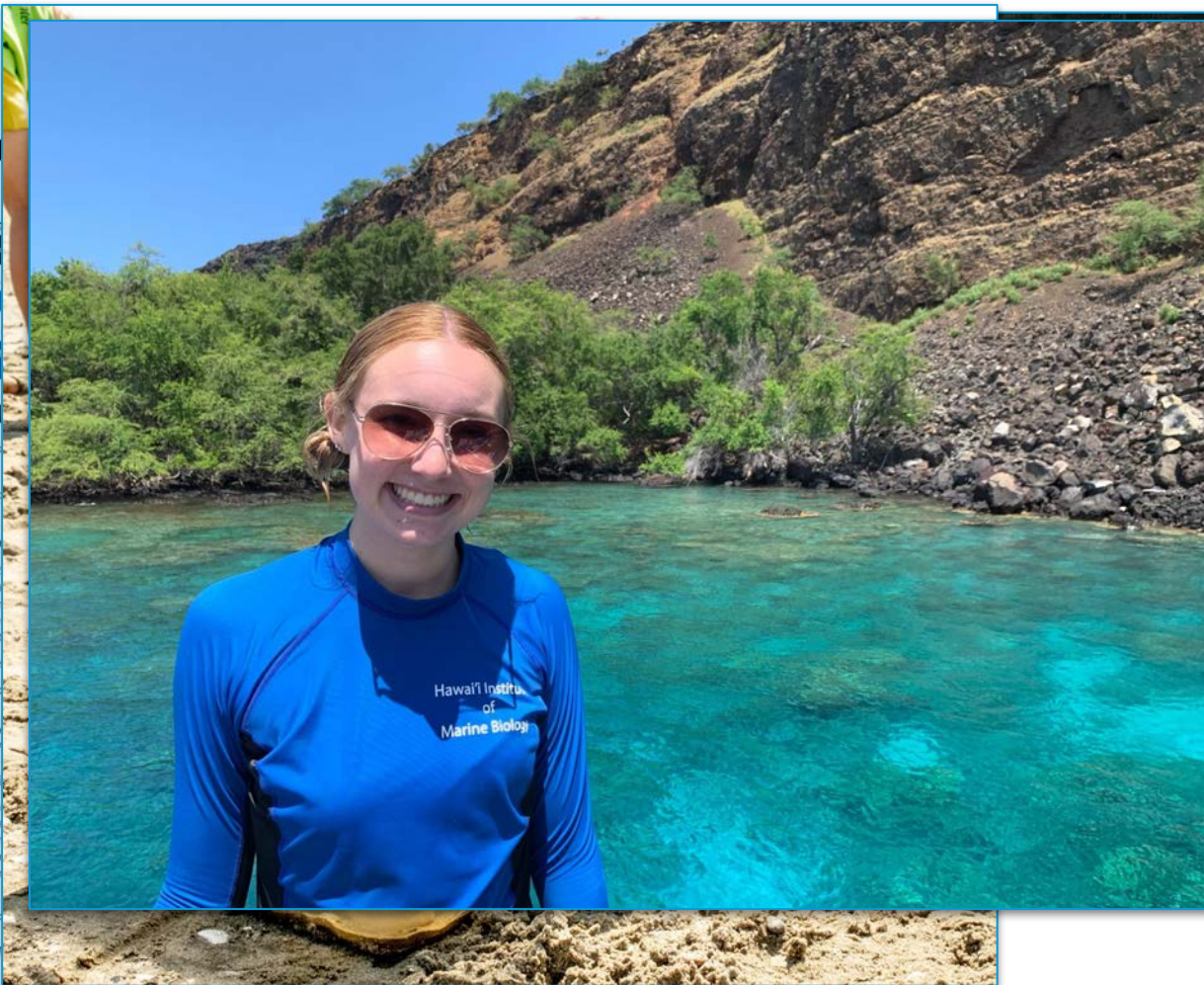
The screenshot shows the NOAA Education website interface. At the top, it includes a search bar for local weather, the NOAA logo, and the text "National Oceanic and Atmospheric Administration U.S. Department of Commerce". A vertical sidebar on the left contains icons for various NOAA programs. The main content area features a large photograph of children interacting with a science exhibit, with the word "Education" overlaid in large white text. Below the photo is a navigation bar with buttons for "Education home", "About NOAA Education", "Resources", "Opportunities", and "News and stories". A dropdown menu is open under "Opportunities", listing "Student opportunities", "Educator opportunities", and "Grants & networks".

Education

Opportunities and resources from across NOAA for students, everywhere.

- Student opportunities
- Educator opportunities
- Grants & networks

# NOAA



# NOAA



An official website of the U.S. Department of Commerce

Find your local weather

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

Home / Education

Education home

## Educator Resources

Find information about

Show opportunities for

### ACLIPSE: Advanced Learning in Pre-Service Science

The ACLIPSE course emphasizes using authentic data. Activities focus on teaching and learning and also improve their skills in using instructional materials.

**Audience:** College & university  
**Opportunity Type:** In person

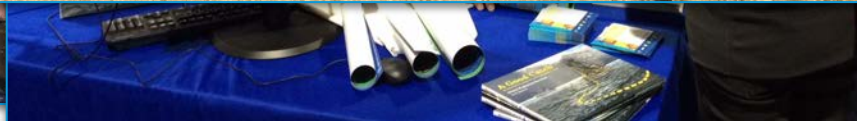
### DataStreme Atmospheric Sciences

A 13-week distance-learning course for people using real-time data and 3 graduate credits.

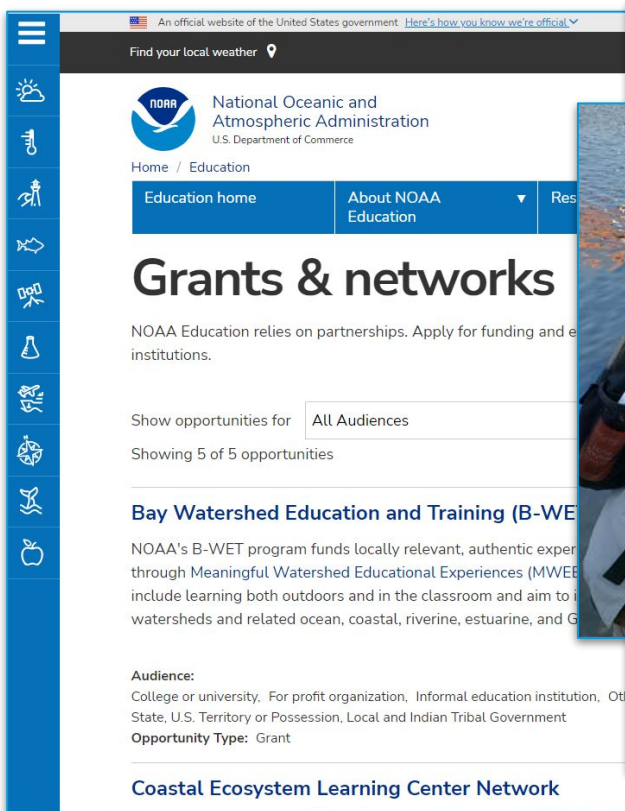
**Audience:** K-12 educators  
**Opportunity Type:** In person

### DataStreme Ocean Sciences

A 13-week distance-learning course on the fluid Earth system emphasizing the atmospheric, ocean, and hydrologic sciences using real-time data, text reading, activities, and online investigations. Course materials



# NOAA grants and networks



An official website of the United States government. [Here's how you know we're official.](#)

Find your local weather

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

Home / Education

Education home About NOAA Education Res

## Grants & networks

NOAA Education relies on partnerships. Apply for funding and e institutions.

Show opportunities for

Showing 5 of 5 opportunities

### Bay Watershed Education and Training (B-WET)

NOAA's B-WET program funds locally relevant, authentic exper through Meaningful Watershed Educational Experiences (MWEE include learning both outdoors and in the classroom and aim to watersheds and related ocean, coastal, riverine, estuarine, and G

**Audience:**  
College or university, For profit organization, Informal education institution, Ot State, U.S. Territory or Possession, Local and Indian Tribal Government

**Opportunity Type:** Grant

### Coastal Ecosystem Learning Center Network



# Educators: Help NOAA help you!

Help NOAA identify the multimedia content that interests you for use with your students, audiences, and your own professional development.

**Please take our 3-minute  
Multimedia Needs  
Assessment!**



# Thank you! Any questions?

Come see us in the exhibit hall at  
Booth #23!



Email us with any questions at  
[education@noaa.gov](mailto:education@noaa.gov)

Find our slides at:  
[noaa.gov/noaa-at-naaee](https://noaa.gov/noaa-at-naaee)

