Aurea Ensemble School Performance

Monday, January 27, 9:00 - 10:00 am
Alvarez High School, Providence

Breaking boundaries between words and music, this performance ensemble with a superb string quartet at its core calls us to listen closely to some of America's most eloquent composers, poets and writers, pointing us to a deeper understanding of our natural world.

Highly praised for its transcendent quality, "Of Nature Composed" premiered in 2016 to celebrate the centennial of the Pulitzer Prize through an exploration of nature, science, the arts and humanities.

This deftly arranged concert program features music by Pulitzer Prize winner John Luther Adams, "one of the most original musical thinkers of the new century" (The New Yorker), composers Charles Griffes, John Cage, Lou Harrison, and Charles Ives; Pulitzer Prize-winning poet Galway Kinnell; former U.S. Poet Laureate Ted Kooser; and naturalists Henry David Thoreau and John Muir.

Featuring:

Nigel Gore, spoken word
Chris Turner, harmonica, spoken word
Mina Lacheva, **Alexey Shabalin**, violins
Consuelo Sherba, viola
Emmanuel Feldman, cello

Presented as part of FirstWorks Earth First programming. Originally commissioned by Rhode Island Council for the Humanities in 2016 to celebrate the centennial of the Pulitzer Prize.

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FIRST works
Connecting Art with Audiences

FirstWorks *Earth First*

A key component of FirstWorks is its dedication to providing transformative arts experiences to youth across Rhode Island. The 2018-19 season marked the launch of our *Earth First* initiative linking the arts with environmental awareness. Aurea Ensemble's performance of *Of Nature Composed*, along with an introduction by NOAA Scientist Catalina Martinez, supports this idea by presenting a deeper performance experience. Many thanks to **The National Grid Foundation** the **CDQ Trust** and **Nordson Corporation Foundation** for making these *Earth First* programs possible.

FirstWorks is pleased to welcome NOAA Scientist Catalina Martinez who will introduce the *Of Nature Composed* performance to 11th grade science students at Dr. Jorge Alvarez High School in Providence. Alvarez High School has a strong science program due to its proximity to Mashapaug Pond and its construction on the former Gorham Manufacturing site. Students have participated in water testing experiments in science class and have integrated the pond in visual art classes. This musical experience supports and expands the STEAM approach to learning in place at Alvarez HS.

Catalina Martinez is the Regional Program Manager for the NOAA Office of Ocean Exploration and Research (OER), with an office on the URI Graduate School of Oceanography (GSO) Campus. A certified diversity professional with three graduate degrees from URI (MS Oceanography, MMA Marine Affairs, MBA), Ms. Martinez began her ocean science career with NOAA in 2002 working on ship operations and logistics, as well as education and outreach initiatives associated with expeditions to explore little known and unknown ocean areas. Ms. Martinez spent many years sailing on research vessels as Expedition Coordinator for NOAA OER, and currently spends most of her time managing the joint efforts associated with multiple important collaborations at URI, and as regional liaison for the program.

Ms. Martinez also works on a variety of local, regional, and national efforts to face the barriers to entry for underrepresented individuals into STEM fields, and was honored with the URI Diversity Award for Staff/ Administrator Excellence in Leadership and Service in 2010 for this work. She consistently seeks to increase potential for life success for individuals born to challenging circumstances, and was recognized by the YWCA as one of their 2015 Women of Achievement in Rhode Island for promoting peace, justice, freedom and dignity. Ms. Martinez also received the 2016 NOAA Oceanic and Atmospheric Research EEO/Diversity Award for Exemplary Service for dedication to improving the representation of women and minorities in STEM. Most recently, Ms. Martinez was honored with the 2019 Women of Color in STEM Diversity Leadership in Government Award for demonstrating sustained leadership in creating a more diverse, equitable, and inclusive Federal workforce.

LESSON 1 - Greenhouse Effect - Gases

Grade Level: Grade 11 Chemistry **Length**: 50 minutes

Introduction: Although many gases in the atmosphere have little effect on weather patterns there are some that have a significant effect on the weather that we experience. Carbon dioxide is one of the gases that do affect weather. This gas has the unique characteristic of absorbing the heat sent to the Earth from the Sun. This helps keeps the Earth warm for life to exist. Carbon dioxide occurs naturally causing the greenhouse effect. The problem starts when humans artificially add higher amounts of carbon dioxide and other greenhouse gases into the atmosphere than is needed to maintain a natural balance. This happens through the burning of fossil fuels (or greenhouse gases), and is causing the Earth's temperature to rise in an enhanced greenhouse effect.

Quick Fact: The Greenhouse gases (GHGs) include water vapor (H20), carbon dioxide (CO2, methane (CH4), nitrous oxide (N20), halocarbons (HC), ozone (O3). Source climatechangeconnection.org

Curriculum Connections:
Students will describe examples of natural phenomena and processes such as weather that illustrate the properties of gases.

Supplies / Materials:

- ☐ Properties of Gases video
- ☐ Erlenmeyer 250 mL flasks
- ☐ Balloons
- ☐ Ice water
- ☐ Hot plate

Hook: As a class go online and look up the weather of your community on different sites such as The Weather Channel and NOAA. What can you gather from this data collection?

Intro Activity: In the computer lab, or on laptops access the "properties of gases videos" watch through and take notes.

Main Activity: Balloon and Flask Experiment

Key concept: When the temperature of a gas is increased, its volume will increase.

Place 10 mLs of water in an Erlenmeyer flask. Stretch an un-inflated balloon over the mouth of the flask (250 mL flask). Place the flask next to a hot plate with a thermal oven glove so that students can move the flask easily from the hot plate to the ice water. Students will see how an increase in temperature can case an increase in the volume of a gas.

Place the flask on a hot plate and let the water boil.

Conclusion / Review:

1. What happens to the balloon? Why?

2. What happens to the balloon when you put the flask in a beaker of ice and let it cool? Why?
Homework: In your science lab journal review our experiment. How does a temperature increase in a hot air balloon relate to increased temperature in our community?

Resources:
1. Chemistry: Gas Laws Smorgasboarg: http://www.arborsci.com/cool/chemistry-gas-laws-smorgasborg

Adapted from lessons created by the Northwest Territories of Canada.

LESSON 2 - Global Temperature Changes - Plastic Waste

Objective: To explore the effect of plastic waste on oceans.

Grade Level: Grade 11 Environmental Science **Length**: 50 minutes

Introduction: Plastics may end up in the oceans through a variety of means – direct dumping, wind, water or animal transport. These plastics may have significant implications for ocean health, through direct consumption and/or leaching of chemicals. This lesson allows students to evaluate media resources to think about these implications.

Curriculum Connections:
Students will understand how human activity can adversely affect global surface temperatures that contribute to global warming.

Supplies / Materials:

☐ Picture of plastic filled seabird (resource 1)
☐ Copies of resources 1 and 2 or computer access

Hook: Show a picture of a seabird with plastic debris inside (see resource 1)

Intro Activity: Have students try to identify the products in the picture.

Main Activity:
1. Have students read the websites (the class may be divided in half). Have them ask critical questions about what they are reading and evaluate whether they believe the sources are viable.

2. Ask students to brainstorm in small groups how they think the plastic is ending up in the ocean. Ask them to think about their community in particular and how it could be connected to the ocean:

- What rivers flow into the ocean?
- Which animals may carry stuff out to the ocean?
- Which means of transportation may result in wastes in the ocean?
- Where is the dump situated and how is waste secured from elements that may move them?
- List three actions you can take to reduce your carbon footprint.
- What would you like to learn more about in relation to climate change and global warming?

Independent Student Work: Allow students some time to research their questions. Have them come up with an action plan to change the use of plastic in their own lives and/or other students.

Conclusion / Review: Have students share some ideas about plastic contamination.

Homework: Finish independent student work.

Resources:

1. Plastics and Ocean Health - includes picture of seabird full of plastic: http://serc.carleton.edu/NAGTWorkshops/health/case_studies/plastics.html

2. Article about plastic in arctic ice: http://www.sciencemag.org/news/2014/05/trillions-plastic-pieces-may-be-trapped-arctic-ice

Adapted from lessons created by the Northwest Territories of Canada.

LESSON 3 - Sea Level Rise - Climate Change & Coral Activities

Objectives:

- Understand Climate Change and its impacts on the world's oceans
- Realize that fossil fuel emissions are responsible for this warming trend
- Become familiar with alternative forms of energy, specifically renewable energy
- Take the challenge to reduce your energy consumption and encourage others to do the same

Grade Level: Grade 5 - 12 **Length**: 90 minutes

Introduction: Incoming energy from the sun is absorbed by the Earth and then redistributed by atmospheric and oceanic circulation before being radiated back to space. Naturally occurring 'greenhouse gases' in the Earth's atmosphere—water vapor (H_2O), carbon dioxide (CO_2), ozone (O_3), methane (CH_4) and nitrous oxide (N_2O)—absorb some of this outgoing thermal radiation, which is ultimately reflected back to warm the Earth's surface. This phenomenon is typically known as the 'greenhouse effect'. An enhanced greenhouse effect is now considered to be occurring, due to substantially higher concentrations of greenhouse gases in the atmosphere. This is causing global warming and climate change.

The oceans are not exempt. Sea level is rising, the oceans are becoming more acidic, species are changing habitats and migrating, corals are bleaching, and storms are becoming stronger and more frequent.

The current increase in global temperature of 0.7°C since pre-industrial times is already disrupting life in the oceans, from the tropics to the poles. The species affected include everything from plankton to corals, fish, polar bears, seals, penguins, and seabirds. Nearly half the CO_2 produced by human activities in the last 200 years has been absorbed by the ocean. The ocean is now becoming more acidic as a result. When CO_2 dissolves into water, it forms carbonic acid. As pH decreases (becomes more acidic), it decreases the ability of shellfish to make their shells and corals to build their skeletons.

For a short video of showing past and predicted temperature changes from 1870 to 2100:
https://www.youtube.com/watch?v=39cBqY1sszY

We possess all of the knowledge and technology needed to reduce our emissions. Some governments have begun to do their part and as a result, their economies have actually grown. There are lots of things you can do as an individual to reduce your own daily emissions and save money in the process.

Curriculum Connections:
Through simple experiments students discover the effects of climate change on the ocean and discuss their impacts on marine life and people.

Did You Know?

- The ten hottest years on record have occurred in the last two decades.
- Current atmospheric concentrations of CO_2 are higher than they've been in the past 420,000 years and likely, for the past 20 million years.
- The primary human-related causes of CO_2 release are fossil fuel combustion (mainly oil, coal and gas) and deforestation.
- Sea level is projected to rise another meter or more by the end of this century.
- When water temperatures get too high, corals expel the symbiotic algae that give coral their food and color, causing them to "bleach" and die.
- Recent years have seen widespread and severe coral bleaching episodes around the world.
- As the oceans warm, the location of the ideal water temperature may shift for many species and some have already begun migrating.
- Species will face extinction if they are not able to move due to natural or manmade barriers.
- Two (uninhabited) islands have already been submerged and a number of island nations exist at only a few meters above sea level

LESSON 3 - Sea Level Rise - (Continued)

Lesson: Ocean Effects

Supplies / Materials:

- ☐ 2 Beakers (measured containers)
- ☐ Water
- ☐ Salt
- ☐ Bromphenol blue (acid/base indicator)
- ☐ Dry ice
- ☐ Antacid tablet
- ☐ Straw
- ☐ Ice
- ☐ Stove/Water heater
- ☐ Internet

Experiment 1: Increasing the Acidity of the Ocean

What happens to the pH of the ocean when you add carbon dioxide (CO2)?

Procedure:

1. Make an "ocean" by filling a flask with water and adding a pinch of salt.

2. Add Bromphenol blue (or another pH indicator), it will turn yellow if it is acidic, blue if it is not. It should start out blue.

3. Add a chunk of dry ice (cooled and compressed CO2) to the "ocean" and watch as the color turns from blue to yellow. Wear protective gloves – dry ice to be handled by teacher only.

4. Explain that as the dry ice sublimates (goes from a solid to a gas), CO2 bubbles enter the ocean, which makes it more acidic.

5. Try the same experiment again, except instead of placing dry ice in the "ocean" use a straw to blow CO2 into the water. You should see the same color change (from blue to yellow).

6. Explain that the ocean can hold a great deal of CO2, but that today the levels are starting to change the chemistry of the ocean. The oceans are becoming more acidic (like the yellow "ocean").

How does this chemical change affect marine life?

7. Explain that the marine life that are most vulnerable to an acidic ocean are those that use Calcium carbonate (CaCo3), things like mollusks who have shells and coral which use Calcium carbonate to make reefs.

8. Place an antacid tablet into the acidic "ocean." What happens to the tablet? (It should dissolve)

9. Discuss the implications of an acidic ocean on marine life that depends on calcium carbonate.

EXTENSION: The ocean helps to stabilize the world climates. Changes to major ocean currents like the Thermohaline Conveyorbelt, or the North Atlantic current, would cause significant climate changes in places like Eastern North America and Western Europe. Research the causes and effects of disrupting these currents.

LESSON 3 - Sea Level Rise - (Continued)

Experiment 2: Melting Glaciers and Polar Icecaps

Why will global warming increase sea level?

Procedure:

1. Make an "ocean" by filling a beaker (container) with water and adding a pinch of salt.

2. Place a few ice cubes ("icebergs/polar ice cap") in the beaker and take note of the water level (use tape or a marker if it is not a measured container) this watermark will be your "sea level".

3. Ask students if they think that the water level (sea level) will change when the ice melts. (Will sea level rise when the polar ice cap melts?)

4. Set "ocean" with ice aside, (you can place it under a heat lamp "sun" to increase the rate of melting)

5. Take another beaker and place the same amount of water and salt in to this container so that the "sea level" is the same.

6. Place a few of ice cubes in a bowl and explain to the students that the bowl represents Greenland (ice/ glaciers that are not floating in the ocean).

7. What will happen to the "sea level" when the ice in the bowl (Greenland) melts and runs into the "ocean"?

8. Either wait for the ice to melt in the bowl, or simply add the ice and note the "sea level."

9. Discuss the difference between the impacts of the polar icecaps melting verses the glaciers on Greenland. Which will cause sea level to rise more? (Greenland) Why doesn't the melting of ice burgs/icecap change the sea level? (Ice in water is already displacing that amount of water)

Experiment 3: Thermal Expansion

What is thermal expansion and how why does it lead to sea level rise?

Procedure:

1. Make an "ocean" by filling a beaker (container) with water and adding a pinch of salt.

2. Take note of the water level ("sea level").

3. Ask students if they thing that the "sea level" will decrease or increase when it is heated? Explain how climate change is increasing the temperature of the ocean, what will happen to the ocean as sea level changes?

4. Heat the water and take another measurement. Has the sea level risen?

Note: As water is heated, it will create steam which leads to the reduction of water level. Avoid heading water to boiling point.

5. How will sea level rise affect people living on the coasts? What kinds of threats do people face because of increasing sea level? 6. Warmer oceans lead to stronger and more frequent storms. What can we do to protect our coasts and ourselves?

Adapted from lessons created by NOAA.

LESSON 4 - The American Renaissance and Transcendentalism

The American Renaissance and Transcendentalism
By Thomas Hampson and Carla Maria Verdino-Süllwold, PBS I Hear America Singing

Transcendentalism was a visionary way of thinking that was widespread in 19th-century American art and thinking. Among those associated with the movement were Emerson, Thoreau, and the Alcotts. Composers who were influenced by Transcendentalist thinking include Edward MacDowell. Charles Ives, and Charles Griffes.

"We will walk on our own feet; we will work with our own hands; we will speak our own minds… A nation of men will for the first time exist, because each believes himself inspired by the Divine Soul which also inspires all men."

With this fiery challenge Ralph Waldo Emerson concluded his 1837 Harvard Phi Beta Kappa Address "The American Scholar", which was received with great enthusiasm. Emerson argued not only for a new American culture, freed from European bondage, but also for a rebirth of an intellectual and artistic life that was inextricably bound up with the life of the spirit. Before long, Emerson and his circle of writers, reformers, and artists would christen those ideals which governed the spirit of "Transcendentalism".

The Transcendentalists stood at the heart of the American Renaissance – the flowering of our nation's thought in literature, poetry, painting, sculpture, architecture, and music in the period roughly from 1835 to 1880. Transcendentalism was concentrated in Boston and in Concord, Massachusetts, which was the home of many of its literary members, such as Emerson, Thoreau, Hawthorne, Margaret Fuller, the Alcotts, Theodore Parker, Jones Very, George Ripley, the Peabody Sisters, and the Channings. But Transcendentalism was far broader than a geographical phenomenon or a select club (though Ripley and Emerson founded the Transcendental Club in 1836). Rather, it was a faith shared by such diverse minds in such diverse places as those of Walt Whitman in Brooklyn, Emily Dickenson in Amherst, and the Hudson River School of painters in New York. It was a visionary bent, a way, as the English Romantic poet William Wordsworth once described his mission, "of seeing into the life of things", and it permeated the best of American thought and art throughout much of the 19th century. Even those artists of the American Renaissance who would find difficulty with the optimism of the Transcendentalists – Hawthorne and Melville among them – were forced to focus on and respond to the existential issues the movement raised.

The term Transcendentalism was derived from the philosopher Kant, who called "all knowledge transcendental which is concerned not with objects but with our mode of knowing objects." The roots of the American philosophy ran deep into German and English Romanticism. From German philosophers such as Fichte and Herder it received its mystic impulse; from Goethe, Novalis, Jean-Paul, Heine, and the other great German Romantic poets it acquired its imagistic language and themes. German thought was by and large filtered through English translations – Coleridge and Carlyle's among the best. The English Romantics who enriched the Americans' perspectives included Blake, Wordsworth, Shelley, Keats, and Byron.

In his 1842 address delivered at Boston's Masonic Temple, which was later reprinted in The Dial, Emerson attempted to define the philosophy in simple terms: "What is popularly called Transcendentalism among us, is Idealism; Idealism as it appears in 1842." In reality it was a far more complex collection of beliefs: that the spark of divinity lies within man; that everything in the world is a microcosm of existence; that the individual soul is identical to the world soul, or Over-Soul, as Emerson called it. This belief in the Inner Light led to an emphasis on the authority of the Self – to Walt Whitman's "I", to the Emersonian doctrine of Self-Reliance, to Thoreau's civil disobedience, and to the Utopian communities at Brook Farm and Fruitlands. By meditation, be communing with nature, through work and art, man could transcend his senses and attain an understanding of beauty and goodness and truth.

Transcendentalism dominated the thinking of the American Renaissance, and its resonances reverberated through American life well into the 20th century. In one way or another our most creative minds were drawn into its thrall, attracted not only to its practicable messages of confident self-identity, spiritual progress, and social justice, but also by its aesthetics, which celebrated, in landscape and mindscape, the immense grandeur of the American soul.

Image: Ralph Waldo Emerson, Library of Congress Prints and Photographs Division, Digital ID; pga 01425

LESSON 4 - The American Renaissance and Transcendentalism

Lesson One:
Addresses the following PPSD 11th grade English Language Arts (ELA) standards: RL.11.4, RI.11.4, RI.11.5, W.11.1a, W.11.2a, W.11.7, W.11.9a, SL.11.1ab, SL.11.2, SL.11.5, L.11.4, L.11.6

Have students read Ralph Waldo Emerson's speech from 1837 entitled The American Scholar located here: http://digitalemerson.wsulibs.wsu.edu/exhibits/show/text/the-american-scholar

Follow-up questions:

1. Ask students to summarize The American Scholar. What is Emerson saying?
2. What is Emerson's central theme in this essay?
3. What trait did Emerson see as crucial in The American Scholar?
4. How does Emerson's The American Scholar relate to education today?
5. How and why does the essay The American Scholar promote "non-conformity, self-reliance, and, anti-institutionalism", and, thus explain the nature of his influence?
6. Can you provide the basis for the concept of "self-trust", individualism, which is a key for Transcendentalist concepts?

Lesson Two:
Listening and writing: Addresses PPSD Grade 9 – 12 Music standards and above ELA standards.

Activities:

Have the students listen to one or more of the following musical pieces that were included in the Aurea Ensemble performance of *Of Nature Composed*.
Charles Ives String quartet no. 1, 2nd movement. (6 min.) https://m.youtube.com/watch?v=pmrwWDb7Mzw
Charles Ives string quartet no. 1, movement 3, Andante. (6 min) http://www.youtube.com/watch?v=-NvTDw10CLQ&sns=em
Charles Griffes Indian Sketch no. 1 (8 min.) https://www.youtube.com/watch?v=yLw8xfiaQYE

Follow-up questions:

1. How does the music make them feel?
2. Can they relate their experience of listening to nature?
3. Accurately describe the elements used to create each piece of music.
4. Comment on the following music elements that are present in the music selection that you are hearing. Use voices/ instrumentation and music terminology in your descriptions where applicable: Melody, Tempo/ Dynamics, Form, Accompaniment, Balance/Blend/Tone, Harmony, Countermelody.

Lesson Three:
Listening and writing: Addresses PPSD Grade 9 – 12 Music standards and above ELA standards.
Have the students listen to the musical piece by Charles Ives included in *Of Nature Composed*:
Ives, 4th mvt., Allegro marziale (6 min.) https://www.youtube.com/watch?v=sdgV2qNsRjU

Follow-up questions:

1. What do they see when they hear the music?
2. What do they feel?

Have the students read the following passage by writer John Cage where he discusses Charles Ives:

Ives in a rocking chair on a verandah. Looking out toward the mountains, he sees the setting sun and hears his own symphony; it's nothing but the sounds happening in the air around him.

Follow-up questions:

1. Can they see what Cage has written when hearing the Ives composition?
2. Have them compare and contrast what Cage describes with what they hear and feel when hearing the Ives composition.

STUDENT SURVEY

"Earth First": Aurea Ensemble
in-school performance, Monday, January 27, 2020, 9:00 am, Alvarez HS, Grade 11

1) Have you ever heard of FirstWorks? ___ Yes ___ No If so, how? :

_____

_____

2) Before this performance, had you heard of Aurea Ensemble?___ Yes ___ No If so, how? :

_____

_____

3) This workshop has expanded my knowledge of music as a means to raise awareness of environmental issues.

☐ Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree

4) Were you able to make connections between this art form and what you're learning about in school? Please explain.

_____

_____

5) What do you remember most strongly from this performance experience?

_____

_____

6) Did you know that FirstWorks Arts Learning Programs are funded through charitable grants and foundations? ___ Yes ___ No

Please write two or three lines thanking our funders for this in-school art and science experience:

_____

_____

_____

_____

7) What is your age? _____

Please list any additional comments below:

Thank you for completing this survey! The information you provide helps FirstWorks shape our educational programming called the FirstWorks Arts Learning Program. We look forward to seeing you at future workshops and performances.

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TEACHER SURVEY

"Earth First": Aurea Ensemble
in-school performance, Monday, January 27, 2020, 9:00 am, Alvarez HS, Grade 11

Name:_____School:_____

Email: _____Phone:_____

1. Were you able to introduce your students to some background information about Aurea Ensemble prior to this performance? What resources did you find most helpful?

_____

_____

2. How did/will you incorporate this experience into your classroom teaching? Did it fit into a unit of study you were already working on?

_____

_____

_____

3. Did this experience provide you with new teaching tools or different points of entry into familiar topics? Please explain.

_____

_____

_____

4. I would estimate the impact on my students' artistic and/or academic growth from today's experience to be:

❒ Strong ❒ Good ❒ Basic ❒ Not very strong

5. Please describe your own and your students' overall experience with this in-school performance experience.

_____

_____

_____

6. This workshop has expanded my knowledge of music as means to raise awareness of environmental issues.

❒ Strongly disagree ❒ Disagree ❒ Neutral ❒ Agree ❒ Strongly agree

Thank you for taking this survey! Information from these surveys helps us shape our programs. Very thoughtful quotes are included in grant applications that help support FirstWorks Arts Learning. *Please encourage your students to think carefully about providing thoughtful feedback.*

Aurea Ensemble School Performance

Of Nature Composed

RESOURCES

Aurea Ensemble: https://aureaensemble.org/
URI Coastal Resources Center: https://www.crc.uri.edu/activities_page/resilience-tools/
NOAA Ocean Acidification: https://www.pmel.noaa.gov/co2/story/Ocean+Acidification
NOAA Educational Programming: https://www.noaa.gov/education/resource-collections
NOAA Climate Education Resources: https://www.noaa.gov/education/resource-collections/climate-education-resources
NOAA Ocean Exploration & Research Lesson Plans: https://oceanexplorer.noaa.gov/edu/lessonplans/lessonplans.html
NOAA Ocean Exploration & Research Expedition Education Modules: https://oceanexplorer.noaa.gov/edu/modules/welcome.html
NOAA Ocean Explorer site: https://oceanexplorer.noaa.gov/

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Articles: Narragansett Times: *Narragansett resident wins STEM award*
Providence Journal Bulletin: *Once a high-school dropout, now honored for promoting STEM diversity*