

# Resilient Youth

## South Hampton Roads



### ***A Pioneer Strategy of Hope and Action To Prepare Those Who Will Inherit Rising Seas***

***Made possible by:***

***NOAA Environmental Literacy Grant to the Elizabeth River Project,***

*In partnership with Norfolk Public Schools, Portsmouth Public Schools, City of Norfolk – Office of Resilience, Old Dominion University, University of Virginia, Chrysler Museum of Art, Virginia Sea Grant, HRSD, Nauticus*

*Final December 2019*

**Elizabeth River Project**  
*Making restoration a reality*





## Elizabeth River Project

*Making restoration a reality*

475 Water Street, C103A  
Portsmouth, VA 23704

[www.elizabethriver.org](http://www.elizabethriver.org)

*The Elizabeth River Project is a non-profit organization working to restore the health of the urban Elizabeth River in Southeast Virginia through education and restoration programs.*

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*Prepared by the Elizabeth River Project under award NA16SEC0080002 from the Environmental Literacy Program of the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce.*

*The statements, findings, conclusions, and recommendations are those of the authors and do not necessarily reflect the views of NOAA or the U.S. Department of Commerce.*





## Voice of the Youth

***“Resilience is important because it gives us the ability to learn from our mistakes.”***

“The more that a species fails, the better prepared it will be the next time, but it has to be able to withstand the first time. If it is able to survive the first time, then a species can better itself by evolving and adapting.”

– Woodrow Wilson High School Youth Resilience Leaders (Portsmouth Public Schools)

***“What does too much water keep you from doing?”***

“It damages animals’ homes as well as keeping my mother and me from going anywhere.”

“It keeps me from playing outside.”

– Chesterfield Academy Youth Resilience Leaders (Norfolk Public Schools)

***“What would you like a Youth Resilience Strategy to include?”***

“How to be safe when streets flood.”

“How to make my city greener.”

“Things we can do to be leaders to help Norfolk.”

“Things we can do to invent cool ways to help capture the rain and reuse it.”

“Teach the teachers about sea level rise too!”

– Chesterfield Academy Youth Resilience Leaders (Norfolk Public Schools)

***“Resilience is important because it gives us the ability to learn from our mistakes.”***

***“It’s hard to learn about something that parents and other adults don’t even know about.”***

– Waters Middle School Youth Resilience Leaders (Portsmouth Public Schools)

# Extraordinary Need:

## Coastal Virginia's Extreme Sea Level Rise

**“SEA LEVEL RISE AND SUBSIDENCE:** Rising seas and localized land subsidence have led to Norfolk having **the highest rate of relative sea level rise on the East Coast**. While global sea levels have risen 6-8 inches over the last century, in Norfolk, the sea level has risen over 14 inches since 1930.”

**“MORE FREQUENT STORMS:** Six out of the eleven highest water levels that affected Norfolk since 1933 occurred in the last twelve years. Flooding risks will continue to increase. **Nuisance tidal flooding in the city has increased by 325 percent since 1960** and the local sea level is projected to rise between 1.5 and 7.5 feet by the year 2100.”

**“INCREASED FLOOD RISKS:** While all residents of Norfolk are increasingly threatened by **more frequent and more intense storms**, as well as routine nuisance flooding, some of Norfolk's most socially and economically at-risk neighborhoods are disproportionately vulnerable to flooding and storms.”

*“Urban resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt and grow no matter what kinds of chronic stresses and acute shocks they experience.”*

- Norfolk Resilient City 2016

## Purpose:

This plan is one of the first in America to call on educators, both in our schools and in the community, to help our youth prepare to inherit these extraordinary and increasing challenges. This youth plan complements Norfolk Resilient City, a call to adults to prepare for rising seas and related challenges.





# Vision Statement:

**Our children will become hopeful, resilient leaders who innovate and persevere to safeguard our community as our lives change with a changing environment.**

## Core Guiding Principles:

- **Hope Through Action:** Young people discover real-world, hands-on roles alongside adults to create a more resilient community.
- **Skills-Based:** Age-appropriate resilience education is provided at every age level that builds the skills to achieve Virginia Standards of Learning.
- **Nature-Based:** Stewardship of the local environment, from the Elizabeth River to the Chesapeake Bay and other natural resources, is key to resilience teaching, which recognizes that environmental health and economic opportunity go hand-in-hand for sustainable resilience.
- **Achievable for Classroom Teachers:** Resilience education is achievable and measurable for the classroom.
- **Innovative:** Our youth help forge the pioneer path to master resilience to rising seas and other changing climate conditions.
- **Connected:** Young people feel connected to each other and the community in their commitment to resilience.
- **A Way of Life:** Resilience becomes part of the way children live in Hampton Roads, Va.
- **Resource-Based:** The community, regional and national resources available for resilience education and involvement are well-known and readily accessible to Hampton Roads educators and students.
- **Giving Voice:** The next generation has a voice when resilience decisions are made in the Hampton Roads community.
- **Fostering Leadership:** This strategy fosters children to become leaders, empowered to guide their communities all their lives to respond with hope and resilient action to rising seas and other changing climate conditions.



Norfolk City Councilwoman Mamie Johnson listens to students explain their action projects at the Elizabeth River Project's Youth Resilience Expo 2018 at Nauticus. As a key part of this strategy, Elizabeth River Project plans an annual expo to help students find hope through action.

## Introduction:

South Hampton Roads, Virginia, has become infamous for the second highest rate of relative sea level rise in the US. As adults here, we are learning to check the tides before we drive home to be sure we can make it. At all levels of the adult community, from the world's largest naval base to city governments, we are discussing how to adapt. Of concern to Elizabeth River Project as sponsors of this plan, waterways are experiencing early impacts on marine life from changes in water salinity, temperature, and exponential increases in pollution from increased flooding.

**But who is preparing the children to inherit even worse effects, yet to come, of this and other changing climate conditions?** This strategy is intended to present the answer. Thanks to a NOAA Environmental Literacy Grant and matching funding including from Hampton Roads Community Foundation, the Elizabeth River Project convened a regional roundtable of education partners from formal and informal settings, along with three groups of youth leaders in Norfolk and Portsmouth, VA., from 2016 to 2019 to prepare a strategy prescribing the most effective ways to educate our youth to grow up as resilient leaders in these unusual times.

The urgency of empowering students to take action presents a central theme. Experts including David Sobel, education author at Antioch University (*Beyond Eco-phobia: Reclaiming the Heart in Nature Education*), advising the roundtable on how best to teach about sea level rise and changing climate conditions, emphasized the need to give children hope rather than instilling fear. Hope, at any age, Sobel and others said, best arrives in environmental arenas when you join with others to take actions that make a difference. Also central to this plan: Preparing our youth for a healthier economic future, hand in hand with a greener future. The link between jobs and alternative energy in Virginia is continually strengthening. Virginia's former Governor Terry McAuliffe recently cited 77,000 clean energy jobs in the state compared to 2,000 coal jobs.

# Empowering students to make a difference will require the community to come together in new ways.

- We'll need to provide **real-world roles** where students can make a difference with resilience challenges. Wetlands in the Classroom, a program of Elizabeth River Project and Lynnhaven River Now, models this by sending students to the field to plant wetlands and native plants at real world restoration sites including Elizabeth River Project's Paradise Creek Nature Park, a partnership with the City of Portsmouth.
- We'll need to commit, as adults with **real sea level-resilience responsibilities**, to welcome students alongside us in resilience projects where we're rolling up our sleeves. A Youth Resilience Expo, piloted by the Elizabeth River Project in 2019, is proposed each year to reward students for meaningful actions.
- We'll need to pool **resilience education resources** and empower community partners to keep these efforts moving forward effectively.
- We'll need the **full commitment of our school systems** to this emerging and urgent education challenge.

The power of a plan is best demonstrated by the degree to which it is already underway before it is finalized. This is happening on multiple fronts. Portsmouth Public Schools has already responded to the challenge by committing to pilot an entire school, Victory Elementary School, as a youth resilience school in 2019-20 with every grade level to participate in teacher training, field investigations, and action projects to incorporate sea level resilience across multiple disciplines. The Hampton Roads Community Foundation has funded the Elizabeth River Project to take a regional lead in coordinating youth resilience efforts, funding a Resilience Coordinator position to manage a clearinghouse for regional youth resilience education and supporting the next three Youth Resilience Expos (2020-22). The Elizabeth River Project's Youth Resilience Roundtable committed at its final meeting to continue their roles by mentoring youth groups when they select resilience action projects for the annual expos. In concert with developing this strategy, the Elizabeth River Project tested the effectiveness of sea level resilience education with 10,000 students a year at multiple settings, and the best of those efforts will continue aboard our Dominion Energy Learning Barge and at Paradise Creek Nature Park.

South Hampton Roads educators: Thank you for the partnerships to prepare resilient youth leaders for a strong future.

## Let's get started.



Elizabeth River Project's Dominion Energy Learning Barge teaches resiliency to 6,000 students yearly.



# Goals:

**Goal 1:** Create a powerful collaboration of school systems and community partners, committed and empowered to prepare Hampton Roads youth to be resilient as they inherit one of the nation's highest rates of sea level rise.

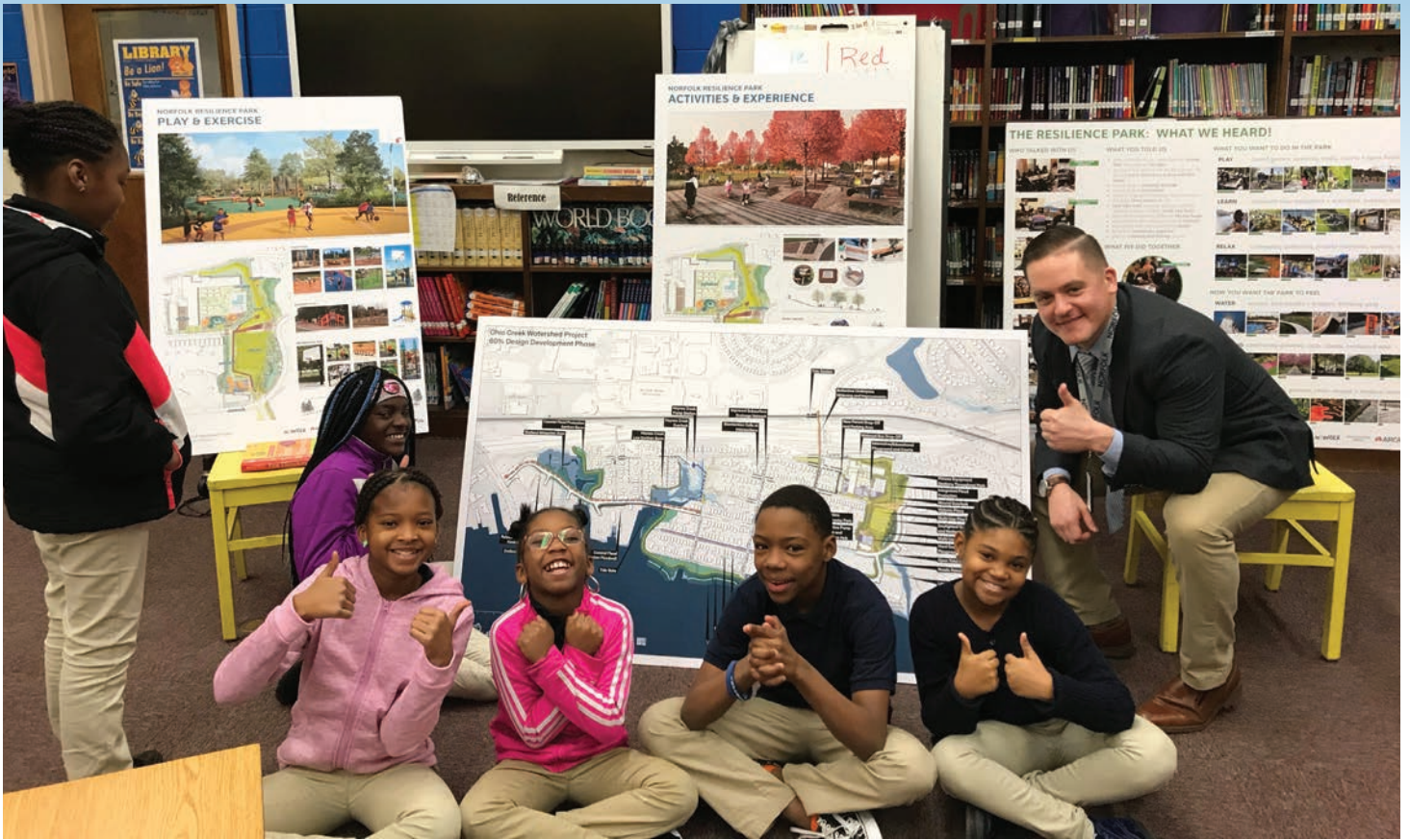
**Goal 2:** Transform teachers and students into environmentally literate citizens regarding resilience issues. Integrate resilience education into the classroom to align with Virginia's Content Guidelines, Standards of Learning and Performance Based Assessments.

**Goal 3:** Hampton Roads youth will create real-world action projects, **discovering hope by making a difference** to address rising sea levels and other changing climate conditions.



Maury High School's team presents results of its action project at Elizabeth River Project's first annual Youth Resilience Expo





Chesterfield Academy's Youth Resilience Leaders (elementary grades, Norfolk Public Schools) visit with the City of Norfolk's resilience office as the voice of youth for resilience plans for their neighborhood shoreline.

**Goal 1: Create a powerful collaboration of school systems and community partners,** maximizing synergy to prepare Hampton Roads youth to be resilient as they inherit one of the nation's highest rates of sea level rise.

**Strategy 1** - Elizabeth River Project will take the lead role to establish a locally oriented clearinghouse, including a web-based menu at [elizabethriver.org](http://elizabethriver.org), for all South Hampton Roads education partners, emphasizing local resources and programs available for youth resilience education. Special thanks to Hampton Roads Community Foundation for start-up funding.

**Strategy 2** - Elizabeth River Project will take the lead to coordinate local education partner efforts in youth resilience to avoid duplication and maximize synergy. This will include inviting community-wide educators to pool resources as practical for teacher trainings, classroom education and student action projects. Community education partners will create a rich toolbox of programs and resources available to South Hampton Roads schools to enhance youth resilience education, avoiding duplication and cooperating to build on rather than duplicate strengths among partners.

Participating partners will share program and resource descriptions with Elizabeth River Project for the web-based menu, and will participate in regional collaborations to ensure the highest quality youth education possible.

Elizabeth River Project will prepare summaries of available resources, from teacher training to field investigations to lesson plans and on-line resources, to distribute on an annual basis to do principals across South Hampton Roads.

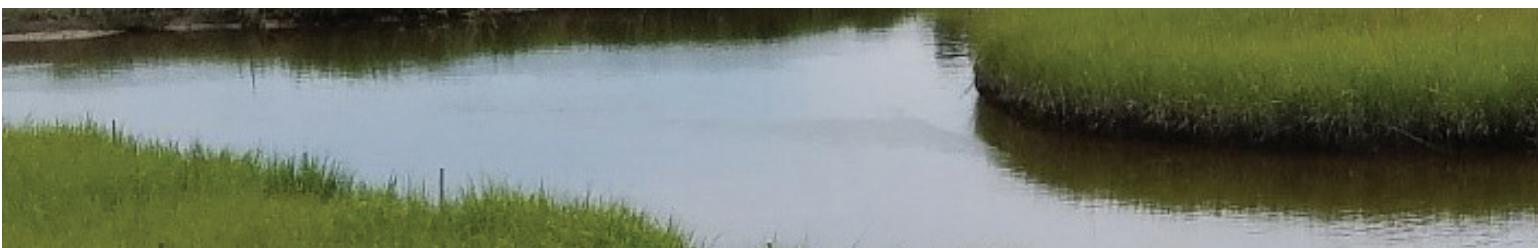
## To date, key collaborators have outlined roles including:

- WHRO - on-line curricula and resources at WHRO's broader web clearinghouse for classroom education at eMediaVA.org.
- VA Institute of Marine Science – teacher professional development; Bridge program – data, lesson plans, teacher center
- Nauticus – programs for field trips using data from a NOAA's Science on a Sphere interactive exhibit on campus
- Old Dominion University – scientific review to ensure latest research is being used in schools instruction
- Tides that Bind/Catch the King – Winner, Guinness World Record for most contributions to an environmental survey when 59,718 survey samples were collected in one day.
- Norfolk Botanical Gardens, VA Aquarium, VA Zoo, Waterman's Museum, Mariner's Museum, Chesapeake Bay Foundation are among community education facilities preparing relevant education experiences.
- NOAA – data and on-line curricula.
- HRSD – hands-on student field trips to HRSD's start-up plant for SWIFT (Sustainable Water Initiative for Tomorrow), an initiative with the potential to ameliorate rising sea levels through recharging the Potomac aquifer. The building has 5,250 sq. ft. of solar panels. Visiting students will learn about the Potomac aquifer and the Chesapeake Bay while learning how HRSD treats wastewater through an 8-step process, incorporating science SOLs for grade 6 and above. Related lesson plans are available at [www.hrsd.com/classroom](http://www.hrsd.com/classroom).
- Elizabeth River Project – clearinghouse for regional sea level resilience education for youth; field investigations aboard the Learning Barge and at Paradise Creek Nature Park; annual Youth Resilience Expo; teacher training as resources allow and Wetlands in the Classroom program to grow wetlands and native plants in the class and plant at restoration sites.
- Lynnhaven River Now – similar Wetlands in the Classroom program.
- Office of Emergency Preparedness & Response – City of Norfolk; resources, review and assistance.
- Girl Scouts of the Colonial Coast - development of relevant Scout badges

**Strategy 3:** Continually engage education decision-makers in understanding the importance of coastal resilience education and resources available.

- Area school boards should become a top priority for invitations to relevant education activities and events
- Plan an “Environmental Science Day” to take school boards and top administrators on the road to visit key education partners and facilities

**Measure of success:** Effective clearing house of resilience education resources established and disseminated; usage tracked over time. Multiple strong partners work together collaboratively in clear roles to support resilience education.







"Princess Elizabeth" (right) honors the Youth Resilience Leaders from Chesterfield Academy.

**Goal 2: Transform teachers and students into environmentally literate citizens regarding resilience issues.** Integrate resilience education into the classroom to align with Virginia's Content Guidelines, Standards of Learning and Performance Based Assessments.

**Strategy 1:** School systems and community education partners will work together to make teacher training on coastal resilience instruction widely available and accessible for all South Hampton Roads school systems, emphasizing elementary schools as those experiencing the greatest need for assistance in science training.

- Elizabeth River Project will work with community education partners and school systems to evaluate availability and accessibility of teacher training on sea level resilience instruction throughout the region, identifying and addressing gaps and barriers including funding needs, scheduling complications, school system buy-in.
- Partners will strive to follow a best practice of including funding for instructional gear and teacher stipends in teacher trainings.
- Education partners in the HR region will share and integrate available lesson plans and other educational resources into their curriculum.
- Elizabeth River Project will provide teacher training through a new Project Blue Crab curriculum in 2019-2021, thanks to NOAA B-Wet and other grant funding.





**Strategy 2:** Community education partners and school systems will work together to ensure that every school in South Hampton Roads has access to hands-on field trips that reinforce coastal resilience instruction, with a priority emphasis on opportunities for elementary students.

## Relevant field trip experiences available for South Hampton Roads schools include:

### Elizabeth River Project

#### 1) Elizabeth River Project's Dominion Energy Learning Barge,

<http://www.elizabethriver.org/learning-barge>

- Preschool, elementary, middle, high school: America's Greenest Vessel with live wetlands, powered by sun and wind. Students rotate through six learning stations to investigate first-hand how to prepare for Norfolk's extraordinary sea level rise and how to play a role in river restoration.

#### 2) Paradise Creek Nature Park, <http://paradisecreek.elizabethriver.org/>

- Preschool, elementary, middle, high school: Students explore a 40-acre urban park demonstrating resilience and the harmony of nature and industry. Over 160 bird species have been identified and students bird watch, learn to identify and participate in native plantings, restoring habitat and edibles for wildlife and the community.

#### 3) Wetlands in the Classroom, <http://elizabethriver.org>

- Preschool, elementary, middle, high school: Students nurture native trees, shrubs, wildflowers and wetland grasses for schoolyards and Elizabeth River restoration sites.

### Chesapeake Bay Foundation's Brock Environmental Center

<https://www.cbf.org/document-library/education-field-program-overviews/brock-environmental-center.pdf>

- Elementary, middle, high school: Tours and education programs at one of the world's greenest buildings. Oyster reefs, conservation, water quality, mapping, point source pollution, runoff and more. Students can also participate in canoeing field experiences.

### Lynnhaven River Now

<https://www.lynnhavenrivernow.org/pearl-schools/>

- Students participate in Wetlands in the Classroom and grow native wetland grasses and other native plants at school and then install them at Lynnhaven River and Virginia Beach restoration sites.

### Nauticus <https://nauticus.org/field-trips/>

- Students explore exhibits and learn through interactive experiments on thermal expansion, glacial melting and the cause and effects of sea level rise and what you can do to help. Programs include: *High Seas*, *Coral & Carbon* and *Living River* and the *Hidden World*.



### **Norfolk Botanical Gardens**

<https://norfolkbotanicalgarden.org/learn/school-programs-tours/school-field-trips/>

- Field trips for grades K-8. Students learn about changes in climate related to plant life cycles, plant and animal interactions, adaptations, ecosystems and food webs.

### **Old Dominion University** <https://sites.wp.odu.edu/odublast/>

- Elementary, middle, high school: ‘Building Leaders for Advancing Science and Technology,’ a three-day summer camp on changes in climate, sponsored by a Virginia Space Grant

### **Virginia Aquarium**

<https://www.virginiaaquarium.com/learn/Pages/Youth-Programs.aspx>

- Elementary, middle, high school: S.T.E.A.M programs, youth conservation series, watershed, wildlife, habitats and changes in climate. Programs include self-guided tour, interactive boat trip, educational film, and marine science outreach programs.

### **Virginia Zoo**

<http://virginiazoo.org/education/school-programs/>

- Elementary, Middle, High school: Hands-on programs where students learn about the changing climate, conservation with animals and exhibits.

## **An evaluator’s recommendations for effective student field experiences relating to resilience.**

For development of this strategy, the Elizabeth River Project tested the effectiveness of sea level resilience education with 25,333 K-12<sup>th</sup> grade students and 2,586 teachers at multiple settings: Aboard the Learning Barge; in the field at Paradise Creek Nature Park, at the Chrysler Museum of Art and in the classroom, growing native plants for restoration sites. Thanks to NOAA funding, effectiveness was evaluated by Phoebe Crisman, University of Virginia. Her conclusions are relevant for all resilience field trips and include:

- A hopeful approach should be incorporated. K-3<sup>rd</sup> grade should include a higher percentage of appreciation of nature, exploration and discovery. Topics related to changes in climate, extreme weather, sea level rise and flooding are better suited for grades 4-12.
- Investigative questions should be incorporated and include time for students to share their thoughts and ideas. Programs should also include environmental stewardship and actions that students can do as engaged citizens to help address challenges, while also helping create resilient communities.
- A measurement tool for program effectiveness should be included. Oral pre and post questions are particularly effective for water based learning such as on the Learning Barge: Oral surveys use less paper, achieve 100% participation and results are tabulated right away, providing immediate feedback for program effectiveness. A written reflection at the end of the field experience can be effective at a land-based site such as the nature park.
- Learning platforms should be assessed for including service learning projects. Paradise Creek Nature Park proved to be a great platform to include hands-on service learning projects. As evident in students’ reflection letters, they felt empowered by removing invasive species that were choking trees and planting their native plants they had nurtured in the classroom.
- Program activities should reflect the venue’s unique natural features. For example, the park programs should include birding and bird education.
- Career, skill-based and leadership programs should be considered in developing resilience programming.
- Opportunities to educate neighborhoods and the broader communities should be considered and offer an opportunity for youth to showcase projects and/or survey the public about issues they are learning about. Elizabeth River Project’s Youth Resilience Leaders participated in the public festival RIVERFest with an educational booth and community survey.
- Students and their voices should be included in development of resilient communities. Youth Resilient Leaders, 63 students, participated in developing this plan.

- Schools should be encouraged to implement resilient projects and be provided an opportunity to showcase their results among peers (as per Youth Resilience Expo).
- Students should be provided an opportunity to express their ideas and/or vision of a resilient community through art. Partnering with the Chrysler Museum of Fine Arts expanded the students’ knowledge of fine art and how over time natural environments have been depicted. In addition, students were given a creative way to voice their vision of resilience.



Exploring the shore is often part of the Learning Barge experience. Right, Robin Dunbar, Deputy Director – Education, Elizabeth River Project, introduces barge visitors to their home river

**Strategy 3:** Continually update resources and curricula for coastal resilience instruction, with partners including:

- Environmental Science Repository, VA Dept. of Education
- WHRO regarding on-line resources

**Strategy 4:** Ensure age-appropriate, priority relevance for Virginia Standards of Learning and other guidelines in ongoing dialogue with school systems. For 2018-19, these included:

**Elementary Schools:**

Conservation, Natural Resources, Surface Change of the Earth Natural Events

**Middle Schools**

Watershed Systems, Conservation, Climate Change and Ecosystems

**High Schools**

Freshwater Resources, Virginia Watershed Systems, Chesapeake Bay

**Strategy 5:** To achieve age-appropriate instruction, incorporate the Ladder of Environmental Responsibility prescribed by David Sobel, author of numerous books and research articles about teaching climate change to youth. Serving as keynote for kickoff of this plan, Sobel recommended “embedding children in a culture that gradually ups the ante of responsibility as children mature.” His model is to create a “ladder of environmental responsibility,” assigning action-oriented projects appropriate to each grade level.

**Measure of success:** Degree to which resilience becomes part of the K-12 curriculum in area schools and is presented by motivated, well-informed teachers, supported by all levels of school administrations.



### **Goal 3:** Hampton Roads youth will create real-world action projects, discovering hope by making a difference to address rising sea levels and other changing climate conditions.



At Paradise Creek Nature Park, Portsmouth, Virginia, a student plants native blueberries.

**Strategy 1:** – Empower youth to conduct hands-on, performance-based resilience projects through the year.

- Schools are encouraged to select actions in the book, *Drawdown, the Most Comprehensive Plan Ever Proposed to Reverse Global Warming*, edited by Paul Hawken, website, [www.drawdown.org/solutions](http://www.drawdown.org/solutions).
- Elizabeth River Project will advise and assist schools as resources allow and invite students to showcase achievements in the watershed at an annual Youth Resilience Expo, also recognizing their schools as Resilient River Star Schools.

Elizabeth River Project’s Wetlands in the Classroom, and a similar program of Lynnhaven River Now, will provide one avenue for students to grow native plants in the classroom and plant them at real-world sites including Paradise Creek Nature Park in Portsmouth.

- Tides That Bind/Catch the King provides the opportunity for students to get involved as citizen scientists on a large scale.
- Virginia Beach Public Schools sponsors a competition encouraging hands-on resiliency related action by students, called Own It (Our Watershed Needs Identified for Today and Tomorrow); contact, [j.cole@vbschools.com](mailto:j.cole@vbschools.com).



## Strategy 2: - Reduce the carbon footprint of schools.

Schools have the largest carbon footprint in Norfolk among categories of government facilities, according to a recent inventory (*Draft 2010 Greenhouse Gas Inventory*, Prepared for the City of Norfolk, VA., January 2012, Mujde Erten-Unal et al.). This means that students have the chance to truly and immediately reduce Norfolk's carbon footprint by "leading from the ground up" at their schools through steps as simple as turning off classroom lights and computer monitors when not in use and lowering the thermostat.

- School systems should explore adding solar panels to schools since they often can be installed at no upfront cost and generate significant cost-savings for school systems over time. Investors such as Suntribe and Convert Solar will install solar panels on schools at zero net cost to the school system. Portsmouth Public Schools in 2018-19 were investigating such opportunities.
- Solar panels today are light weight and low maintenance.
- Consider for schools with relatively new roofs; see more at [solar.the-mcelroys.com/](http://solar.the-mcelroys.com/)
- Schools should consider energy efficiency for cost savings as well. The US Environmental Protection Agency's Energy Star Competitions for Buildings and Plants outlines ways facilities can achieve significant cost savings through reducing energy and water use while gaining training, a sense of comradery and momentum (some schools in VA Beach are currently taking part). School facilities departments may be more than willing to assist students with energy efficiency audits and improvements.

**Measurements:** Calculate carbon footprint reductions, energy savings, return on investment, reductions in flooding, amount of water re-used, outreach initiatives. Acres and species of plants restored; before and after wildlife/bird counts. Measure marshes and the receding shoreline.

**Recognition:** Annual recognition at Youth Resilience Expo as Resilient River Star Schools; selection by judges of the most transferrable project; Cool Schools recognition through National Wildlife Federation; River Star Schools recognition (ERP); Energy Star recognition.



Preparing for the Expo, students investigate ways to address flooding at their schools including how to capture, retain and reuse rain water.



# Resources:

## Selected List of Top Resources 2019

### 1) Taking Action in the Community (Service Learning)

**Wetlands in the Classroom** - Elizabeth River Project for Elizabeth River watershed, 757-399-7487, [www.elizabethriver.org](http://www.elizabethriver.org); Lynnhaven River Now for Lynnhaven River watershed, 757-962-5398, [www.lynnhavenrivernow.org](http://www.lynnhavenrivernow.org). Non-profits provide plants and classroom/teacher guidance for students to grow native wetland grasses and other native plants at school, then install them at real world restoration sites (as funding is available – currently funded, Dollar Tree Foundation).



### 2) Taking Action at School

#### Greening Your School

**Cool Schools** program of National Wildlife Federation & The Nature Conservancy's **Carbon Footprint Calculator** can help schools to reduce carbon dioxide.

- **Cool Schools Challenge:** <https://www.nwf.org/Eco-Schools-USA/Resources/Activities/Projects/Cool-School-Challenge>
- **The carbon calculator** is an excel file which can be downloaded here:  
<https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/>

**Eco-schools:** [www.eco-schools.org](http://www.eco-schools.org)

**Elizabeth River Project, Resilience Youth Expo & Resilience River Star Schools.** Mentors, guidance for action projects recognized at annual Youth Resilience Expo for schools and youth groups in the Elizabeth River watershed (Chesapeake, Norfolk, Portsmouth; Kempsville area of Virginia Beach). Contact Robin Dunbar, [rdunbar@elizabethriver.org](mailto:rdunbar@elizabethriver.org) or Sarah McBride, [smcbride@elizabethriver.org](mailto:smcbride@elizabethriver.org), 757-392-7132.

**Chesapeake Bay Foundation:** [www.cbf.org](http://www.cbf.org)

**Lynnhaven River Now, Pearl Schools:** [www.lynnhavenrivernow.org](http://www.lynnhavenrivernow.org)

Annual recognition for school projects in the Lynnhaven River watershed (Virginia Beach).

**Energy Kids**

U.S. Energy Information Administration <https://www.eia.gov/kids/>



Planting a tree at Victory Elementary School in Portsmouth, 2019, with assistance from Elizabeth River Project.

## Monitoring Programs

- Butterfly Conservation: [www.butterfly-conservation.org](http://www.butterfly-conservation.org)
- Environmental Protection Agency (EPA): [www.epa.gov](http://www.epa.gov) – search education
- Global Learning and Observations to Benefit the Environment (GLOBE): [www.globe.gov](http://www.globe.gov)
- Journey North: <http://www.learner.org/jnorth/orientation/Overview.html>
- Monarch Watch: <http://www.monarchwatch.org>
- Project Feeder Watch: <http://www.birds.cornell.edu/pfw/index>
- State Education and Environment Roundtable (SEER)
- A review of studies to analyze the impact of using the environment as a learning context.: [www.seer.org](http://www.seer.org)
- The United National Environment Program
- Gives leadership and encourages people to work as partners in caring for the environment.: [www.unep.org](http://www.unep.org)

## Native Plants, Trees & Wildflowers

- Common Native Trees of Virginia and Common Native Shrubs and Woody Vines of Virginia, Virginia Dept. of Forestry: [www.dof.virginia.gov](http://www.dof.virginia.gov)
- Department of Forestry (Virginia – Chesapeake, VA): [www.dof.virginia.gov](http://www.dof.virginia.gov)
- Environmental Concern (Source for native plants): [www.wetland.org](http://www.wetland.org)
- Field Guide to VA Salt and Brackish Marsh Plants, William & Mary VIMS [www.ccrm.vims.edu/wetlands/wetland\\_plants/8x11brochureannotated2rh.pdf](http://www.ccrm.vims.edu/wetlands/wetland_plants/8x11brochureannotated2rh.pdf)
- *Go Plant a Tree!* Video: [www.pbskids.org](http://www.pbskids.org)



- Lady Bird Johnson Wildflower Center: Native plant database: [www.wildflower.org](http://www.wildflower.org)
- Native Plant Society (Virginia): [www.vnps.org](http://www.vnps.org)
- Guide: Native Plants for Southeast Virginia including Hampton Roads Region  
<http://www.deq.virginia.gov/Portals/0/DEO/CoastalZoneManagement/Native-Plants-for-Southeast-Virginia-Guide.pdf>
- Photos of Plants: <https://plants.sc.egov.usda.gov/java/>
- Pollinator Partnership: U.S. Fish & Wildlife Service: [www.fws.gov/pollinators/Index.html](http://www.fws.gov/pollinators/Index.html)
- Project Learning Tree & Project Wild: [www.plt.org](http://www.plt.org) and [www.projectwild.org](http://www.projectwild.org)
- USDA Plants Database: <http://plants.usda.gov/>
- Virginia Tech Extension Center: [www.arec.vaes.vt.edu](http://www.arec.vaes.vt.edu)

### 3) Lesson Plans for the Classroom

Chesapeake Bay NERR: [www.vims.edu](http://www.vims.edu)

- **ACTIVITY: A Mock Marsh Transect**  
Examining sea level rise scenarios and survey a mock marsh habitat, to make prediction about how the marsh will respond.  
[https://www.vims.edu/cbnerr/docs/education\\_docs/MockMarshActivityWriteUp.pdf](https://www.vims.edu/cbnerr/docs/education_docs/MockMarshActivityWriteUp.pdf)
- **ACTIVITY: Assessing the County's Readiness**  
Students will participate in a role playing scenario in which they represent different stakeholder groups and they create an evacuation route for their county and identifying shelters, establishing new areas for development for the best catch of crabs in the year 2050.  
[https://www.vims.edu/cbnerr/docs/education\\_docs/StakeholderMeetingPart1.pdf](https://www.vims.edu/cbnerr/docs/education_docs/StakeholderMeetingPart1.pdf)

National Aeronautics and Space Administration (NASA): [www.nasa.gov](http://www.nasa.gov)

National Oceanic & Atmospheric Administration: [www.noaa.gov](http://www.noaa.gov)

- **Estuaries 101**  
Lessons and activities that vary from hands on, experiments, fieldwork, and data collection all designed to complement coursework in grades k-12.  
<https://coast.noaa.gov/estuaries/curriculum/index.html>
- **National Data Buoy Center**  
Use this interactive map to locate buoys around the globe. Real time and historical data includes: date, wave height, wave period, wave direction, and water temperature.  
<http://www.ndbc.noaa.gov/>
- **Science on a Sphere**  
Visit your local Science on a Sphere and discover climate change, storms, ocean temperature, and more on the 6-ft. diameter animated globe.  
[https://sos.noaa.gov/What\\_is\\_SOS/index.html](https://sos.noaa.gov/What_is_SOS/index.html)
- **Sea Level Rise Viewer**  
A mapping tool used to visualize community impacts from flooding and sea level rise. Data includes depth, frequency, wetland loss, and more.  
<https://coast.noaa.gov/slr/>
- **SLAMM, Sea Level Affecting Marshes Model**  
Mathematical model which simulates sea level rise impacts on wetlands and shorelines.  
<https://coast.noaa.gov/digitalcoast/tools/slamm.html>
- **ACTIVITY: Climate Change and Currents**  
Students learn the effect of ocean currents on climate change and determine how changes in atmosphere and ocean temperatures could change the Great Ocean Conveyor Belt.  
[https://oceanservice.noaa.gov/education/pd/tidescurrents/effects/climatechange\\_currents\\_lesson.html](https://oceanservice.noaa.gov/education/pd/tidescurrents/effects/climatechange_currents_lesson.html)
- **ACTIVITY: Climate Change and Tides**  
Web-based resources to determine the impact predicted higher tides on coastal areas, devise a plan to mitigate for these tides and discuss how to apply this to communities.  
[https://oceanservice.noaa.gov/education/pd/tidescurrents/effects/climatechange\\_tides\\_lesson.html](https://oceanservice.noaa.gov/education/pd/tidescurrents/effects/climatechange_tides_lesson.html)

- **ACTIVITY: *Estuary Food Pyramid***  
Students will build an estuary food pyramid and discuss how marine food webs will be impacted by climate change through a scientific article.  
<https://coast.noaa.gov/estuaries/curriculum/estuary-food-pyramid.html>
- **ACTIVITY: *Is it Getting Hot in Here?***  
Students discover what causes global climate change, how climate change can affect human communities, and cite evidence of climate change in the 21<sup>st</sup> century.  
[https://oceanservice.noaa.gov/education/lessons/getting\\_hot.html](https://oceanservice.noaa.gov/education/lessons/getting_hot.html)  
Ocean Service Education - <https://oceanservice.noaa.gov/education/>
- **National Ocean Service's Facts about Sea Level Rise:** <http://oceanservice.noaa.gov/facts/sealevel.html>
- **ACTIVITY: *Seasonal Swings***  
Compare weather data between estuaries at different latitudes to determine trends between air and water temperature and dissolved oxygen. <https://coast.noaa.gov/data/estuaries/pdf/seasonal-swings-teacher-guide.pdf>
- **ACTIVITY: *The Earth's Energy Budget: Global Energy Flow***  
Students learn how energy, in the form of radiation, flows from the sun to the earth and how Earth's atmosphere and surface plays a role in this exchange  
[https://oceanservice.noaa.gov/education/lessons/earth\\_energy\\_budget\\_lesson.html](https://oceanservice.noaa.gov/education/lessons/earth_energy_budget_lesson.html)
- **ACTIVITY: *The Stinging Sea: Ecological Forecasting of Sea Nettles in Chesapeake Bay.*** Scientists predict that that as temperatures and salinity in the bay change sea nettles will become more abundant in the Chesapeake Bay. Students will explore this form of "ecological forecasting" and determine how these changes impact natural resources and human communities. [https://oceanservice.noaa.gov/education/lessons/stinging\\_sea.html](https://oceanservice.noaa.gov/education/lessons/stinging_sea.html)
- **Tides and Currents:** <http://tidesandcurrents.noaa.gov/sltrends/>
- **ACTIVITY: *Water Life: Where Rivers Meet the Sea***  
In this educational online game student clean waterways, plant habitat, and pick-up trash to restore the food web. <https://games.noaa.gov/oscar/>
- **ACTIVITY: *Water Going Up; Water Going Down***  
Students make explore the tides, compare tidal height and oxygen levels using data collected at different National Estuarine Research Reserves, and use a model to discover how human development can change the way sand moves along shorelines.  
<https://coast.noaa.gov/data/estuaries/pdf/water-going-up-water-going-down-teacher-guide.pdf>
- **Nature Conservancy: Coastal Resilience Decision Support Tool**  
<http://maps.coastalresilience.org/gulfmex/>

## 4) ADDITIONAL RESOURCES

### Books

- Anderson, Lauren. *Changing Tides, How Sea-Level Rise Harms Wildlife and Recreation Economies Along the US Eastern Seaboard*. National Wildlife Federation: 2016.
- Bloomberg, Michael and Pope, Carl. *Climate of Hope*. New York: St. Martin's Press, 2017.
- Broda, Herbert. *Schoolyard-Enhanced Learning – Using the Outdoors as an Instruction Tool, K-8*. Portland, Maine: Stenhouse Publishers, 2007.
- Chiras, Dan. *EcoKids*. Canada: New Society Publishers, 2005.
- Cornell, Joseph. *Sharing Nature with Children*. Nevada City, CA: Dawn Publications, 1979.
- Cornell, Joseph. *Sharing the Joy of Nature*. Nevada City, CA: Dawn Publications, 1989.
- Gershon, David and Robert Gilman. *Household Eco Team Workbook: A Six-month Program to Bring Your Household into Environmental Balance*. Global Action Plan for Earth, 1992.
- Grant, Tim. *Greening School Grounds*. Canada: New Society Publishers, 2001.
- Hallsmith, Gwendolyn. *The Key to Sustainable Cities: Meeting Human Needs, Transforming community Systems*. New Society Publishers, 2003.



- Hewitt, Sally. *Your Local Environment*, Crabtree Publishing Company, Canada, 2009.
- Hewitt, Sally. *Using Energy*, Crabtree Publishing Company, Canada, 2009.
- National Wildlife Federation. *Reaching High Academic Standards on the Schoolyard*. [http://static.pdesas.org/content/documents/academic\\_standards\\_for\\_environment\\_and\\_ecology.pdf](http://static.pdesas.org/content/documents/academic_standards_for_environment_and_ecology.pdf) Louv, Richard. *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*.

## Magazines

*Green Teacher Magazine*. [www.greenteacher.com](http://www.greenteacher.com)

National Geographic Young Explorer (K-1). [www.kids.nationalgeographic.com](http://www.kids.nationalgeographic.com)



## Reports

- National Research Council of the National Academies. *Climate Change Education Formal Settings, K-14, a Workshop Summary*, 2012.
- National Wildlife Federation. *Sea-Level Rise and Coastal Habitats of the Chesapeake Bay: A Summary*, 2008
- NSTA Reports*, National Science Teachers Association. Arlington, VA, [www.nsta.org](http://www.nsta.org)
- Rowe, Sue. *Seasons in the School Grounds*. Exmouth, Devon: Learning Through Landscapes Trust, Southgate Publishers Ltd., 1992.
- Schiff, Paul and Smith-Walters, Cindy. *Wild School Sites: A Guide to Preparing for Habitat Improvement Projects on School Grounds*. Bethesda, MD: Project Wild, 1993.
- Smith, Gregory. *Place-Based Education: Learning to Be Where We Are*. XXXX
- Sobel, David. *Beyond Ecophobia – Reclaiming the Heart of Nature Education*. Portsmouth, NH: Heinemann, 1998.
- Sobel, David. *Mapmaking with Children: Sense of Place Education for the Elementary Years*. Portsmouth, NH: Heinemann, 1998.
- Sobel, David. *Place-Based Education: connecting Classrooms and Communities*.  
Southeastern Forests and Climate Change~Project Learning Tree. [www.plt.org](http://www.plt.org)
- Thomas, Gill. *Science in the School Grounds*. Crediton, Devon: Learning Through Landscapes Trust, Southgate Publishers Ltd., 1992.

## Chesapeake Bay

- Alliance for the Chesapeake Bay: [www.allianceforthebay.org](http://www.allianceforthebay.org)  
Chesapeake Bay Foundation: [www.cbf.org](http://www.cbf.org)

## Websites

- Alliance for Climate Protection: [www.climateprotect.org](http://www.climateprotect.org)
- Alliance for Climate Education: [www.acespace.org](http://www.acespace.org)
- CLEAN: Climate Literacy and Energy Awareness Network  
<https://cleanet.org/index.html>
- Climate Action Network (CAN) International  
[www.climatenetwork.org](http://www.climatenetwork.org)
- Climate Care  
Climate care offsets your carbon dioxide by funding renewable energy and energy efficiency projects around the world. [www.climatecare.org](http://www.climatecare.org)
- Cousteau Society  
[www.cousteausociety.org](http://www.cousteausociety.org)
- Environmental Defense Fund: [www.edf.org](http://www.edf.org)
- Global Greenhouse Gases  
U.S. Energy Information Administration  
<https://www.eia.gov/energyexplained/>
- Global Warming Question and Answer Web Site  
<https://www.climate.gov/news-features/understanding-climate/global-warming-frequently-asked-questions>
- Greenhouse Gases and Society  
<http://css.umich.edu/factsheets/greenhouse-gases-factsheet>
- \Kids against Climate Change - resources and teaching ideas for elementary students to learn about climate change, its impacts, and actions kids and adults can take to prepare and respond to it. The resources are research-based and the materials are age appropriate. They are not all SLR specific but some touch on that issue. <https://kidsagainstclimatechange.com/>





LEARNING BARGE

The Learning Barge

100% Off Fuel

America's Greenest Vessel



MapCenter.com: <http://mapcenter.com>

Click on World Maps

Maps of World: [www.mapsofworld.com](http://www.mapsofworld.com)

National Marine Fisheries Service: <https://www.st.nmfs.noaa.gov/spo/SPO/index.htm>

National Network for ocean and Climate Change Interpretation  
[www.climateinterpreter.org](http://www.climateinterpreter.org)

Natural Resources Conservation Service: [www.nrcs.usda.gov](http://www.nrcs.usda.gov)

Sierra Club: [www.sierraclub.org](http://www.sierraclub.org)

The Climate Project: [www.theclimateprojectus.org](http://www.theclimateprojectus.org)

The Nature Conservancy: [www.tnc.org](http://www.tnc.org)

Tiki the Penguin – oneclimate.net [http://tiki.oneworld.net/global\\_warming/climate\\_home.html](http://tiki.oneworld.net/global_warming/climate_home.html)

## **Place-based Field Experiences**

### **Hampton Roads**

Brock Environmental Center

<http://www.cbf.org/about-cbf/locations/virginia/facilities/brock-environmental-center/>

Chesapeake Arboretum

<http://www.cityofchesapeake.net/government/Boards-Commissions/full-listing/ceic.htm>

Elizabeth River Project's Dominion Energy Learning Barge

<https://elizabethriver.org/dominion-energy-learning-barge>

False Cape State Park

[http://www.dcr.virginia.gov/state-parks/false-cape#general\\_information](http://www.dcr.virginia.gov/state-parks/false-cape#general_information)

First Landing State Park

[http://first-landing-state-park.org/first\\_landing\\_activities.html](http://first-landing-state-park.org/first_landing_activities.html)

4-H Educational Center

[http://www.airfieldconference.com/page/4\\_h-camps-&-youth-programs/](http://www.airfieldconference.com/page/4_h-camps-&-youth-programs/)

Great Dismal Swamp

[https://www.fws.gov/refuge/great\\_dismal\\_swamp](https://www.fws.gov/refuge/great_dismal_swamp)

Hermitage Foundation: [www.thehermitagemuseum.org](http://www.thehermitagemuseum.org)

Hunt Club Farm Field Trips: <http://www.huntclubfarm.com/field-trips/>

The Mariners' Museum and Park: <http://www.marinersmuseum.org/>

Nauticus: [www.nauticus.org](http://www.nauticus.org)

Norfolk Botanical Gardens

<https://norfolkbotanicalgarden.org/>

Paradise Creek Nature Park: <https://elizabethriver.org/paradise-creek-nature-park>

Sandy Bottom Nature Park

<http://www.hampton.gov/142/Sandy-Bottom-Nature-Park>

Virginia Aquarium and Marine Science Center

<https://www.virginiaaquarium.com/learn/Pages/School-Programs.aspx>



## Outside of Hampton Roads

Delaware: Delaware Nature Society: <http://www.delawarenaturesociety.org/>

Maryland: Living Classrooms Foundation <https://livingclassrooms.org>

Maryland: Baltimore Aquarium: [www.aqua.org](http://www.aqua.org)

Smithsonian Environmental Research Center: [www.sirc.si.edu](http://www.sirc.si.edu)

USA: National Park Service: [www.nps.gov](http://www.nps.gov)

## Solar Power

Bernard Solar Panel Cooker: <http://solarcooking.org/plans/spc.htm>

Dominion Energy: [www.dom.com](http://www.dom.com)

Financing Solar: [solar.the-mcelroys.com](http://solar.the-mcelroys.com)

National Aeronautics and Space Administration : <https://solarsystem.nasa.gov/solar-system/sun/overview/>

Solar Electric Light Fund (SELF): [www.self.org](http://www.self.org)

Solar Cooking Archive: <http://solarcooking.org/plans/>

Solar Energy International: [www.solarenergy.org/resources/kids.html](http://www.solarenergy.org/resources/kids.html)

Sundance Solar Products, Inc.: <https://store.sundancesolar.com/20-watt-do-it-yourself-solar-energy-kit/>

Solar Services: [www.solarservices.com](http://www.solarservices.com)

Sundance Solar Products, Inc.: <https://store.sundancesolar.com/20-watt-do-it-yourself-solar-energy-kit/>



Students at Waters Middle School show off their solar oven project.



## Storm water & Water Quality

VA Department of Environmental Quality: <https://www.deq.virginia.gov/>  
Hampton Roads Sanitation District: [www.hrpdcva.gov](http://www.hrpdcva.gov)  
Norfolk Stormwater: [www.norfolk.gov](http://www.norfolk.gov)  
Project Wet: [www.projectwet.org](http://www.projectwet.org)  
Stormwater Runoff: [www.askHRgreen.org](http://www.askHRgreen.org)

## Supplies

Carolina Biological, [www.carolina.com](http://www.carolina.com)  
Educational Innovations, [www.TeacherSource.com](http://www.TeacherSource.com)  
Texas Instruments, [www.TI-Innovator.com](http://www.TI-Innovator.com)  
Vernier, [www.vernier.com](http://www.vernier.com)

## WHRO/Public Broadcasting Systems

- **Carbon Calculator**  
<http://www.meetthegreens.org/features/carbon-calculator.html>
- **ACTIVITY: Be a Trash Detective** [http://pbskids.org/plumlanding/games/outdoor\\_adventures/adventure.html?m=95](http://pbskids.org/plumlanding/games/outdoor_adventures/adventure.html?m=95)
- **ACTIVITY: Buy Green – Being an Eco Friendly Consumer** [http://www.pbs.org/parents/seekoworld/lessons4\\_1.html](http://www.pbs.org/parents/seekoworld/lessons4_1.html)
- **ACTIVITY: Citizen Science**  
<http://pbskids.org/scigirls/citizen-science>
- **ACTIVITY: (Young elementary) Count the Seahorses** <http://pbskids.org/catinthehat/games/do-you-see-my-seahorse>
- **ACTIVITY: Don't Flood the Fidgets**  
[http://pbskids.org/designsquad/games/dont\\_flood/](http://pbskids.org/designsquad/games/dont_flood/)
- **ACTIVITY: Follow the Wandering Water** [http://pbskids.org/plumlanding/games/outdoor\\_adventures/adventure.html?m=106](http://pbskids.org/plumlanding/games/outdoor_adventures/adventure.html?m=106)
- **ACTIVITY: Reduce, Recycle, Reuse**  
[https://www.pbslearningmedia.org/resource/lpsc10.sci.life.lp\\_reduce/reduce-reuse-recycle/](https://www.pbslearningmedia.org/resource/lpsc10.sci.life.lp_reduce/reduce-reuse-recycle/)
- **ACTIVITY: The Air Around Us**  
[https://www.pbslearningmedia.org/resource/phy03.sci.phys.descwrlld.lp\\_air/air-is-matter/](https://www.pbslearningmedia.org/resource/phy03.sci.phys.descwrlld.lp_air/air-is-matter/)
- **APPS: Outdoor Exploring**  
<http://pbskids.org/apps/>
- **VIDEO: Neighborhood Cleanup Storybook**  
<http://pbskids.org/daniel/stories/neighborhood-clean-up/#>





## Wildlife

- Cornell: [www.cornell.edu](http://www.cornell.edu)
- National Audubon Society: <https://www.audubon.org/>
- National Wildlife Federation: [www.nwf.org](http://www.nwf.org)
- Project Wild Aquatic: [www.projectwild.org](http://www.projectwild.org)
- Roots and Shoots: [www.rootsandshoots.org](http://www.rootsandshoots.org)
- U.S. Fish and Wildlife: [www.fws.gov](http://www.fws.gov)
- World Wildlife Fund: <https://www.worldwildlife.org/>
- Protects animals in their natural habitats: [www.wwf.org](http://www.wwf.org)

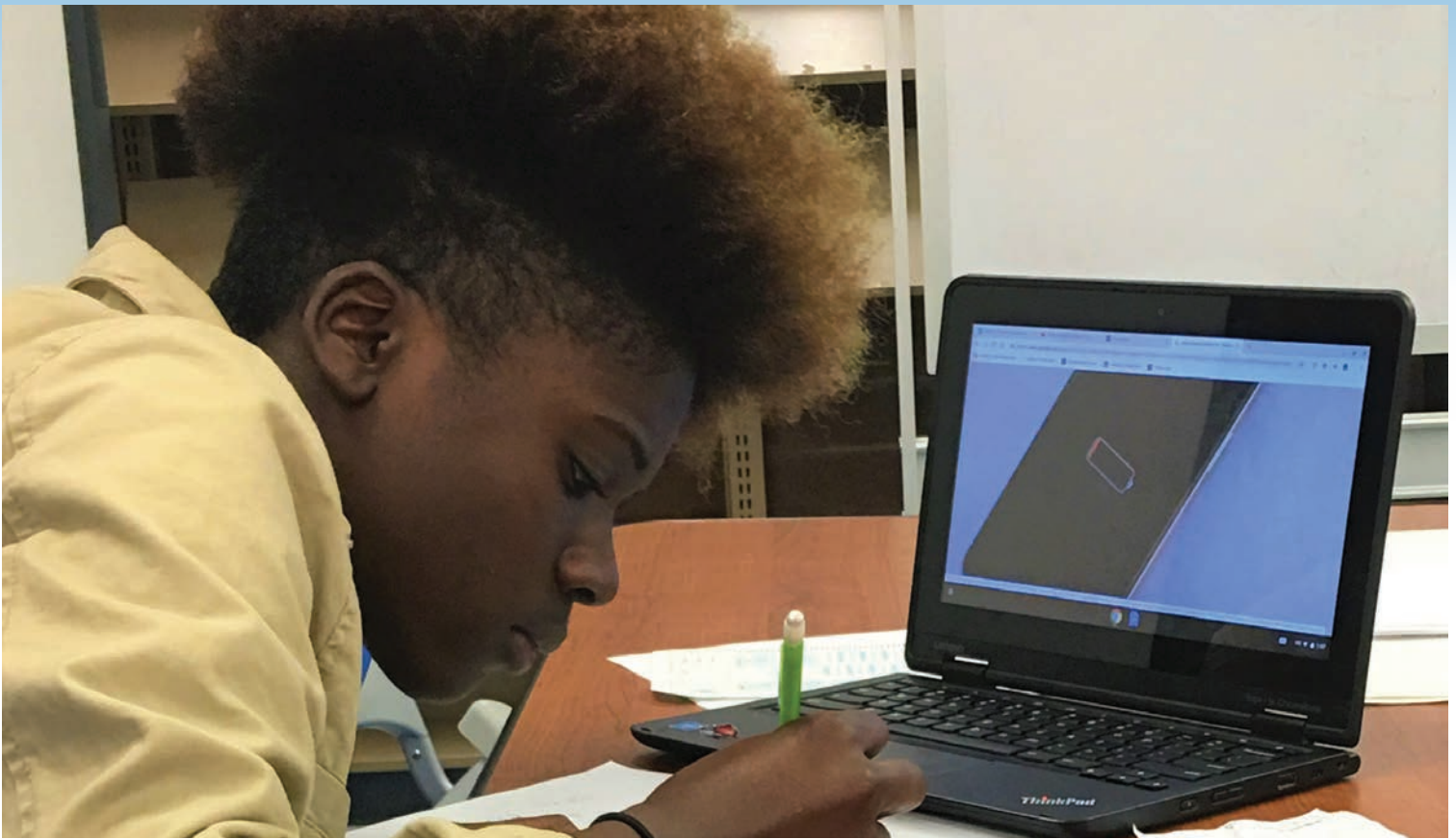
## Windpower

- USA Wind Generators: [www.usawindgen.com](http://www.usawindgen.com)
- Climate Change Connection: [www.climatechangeconnection.org/](http://www.climatechangeconnection.org/)
- Idle Free Ontario: <https://www.nrcan.gc.ca/energy/efficiency/communities-infrastructure/transportation/idling/4397>
- Environment Canada: <http://www.windatlas.ca/nav-en.php?no=10>
- U.S. Department of Energy: <https://windexchange.energy.gov/>

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## Youth Resilience Roundtable

Special thanks to these community leaders for guiding this plan.

Adrienne Britton, Norfolk Public Schools  
Adrienne Sawyer, Elizabeth River Project Curriculum Development  
Alacia Wever, Hampton Roads Sanitation District  
Alexandra Cantwell, Norfolk Botanical Gardens  
Andrew Larkin, NOAA Chesapeake Bay Office  
Arthur E. Fichter IV, Solar Services  
Christine Morris, City of Norfolk Resilience Office  
Col. Paul Olsen, Old Dominion University  
Daniel Lewandowski, Portsmouth Public Schools  
David Ricks, City of Norfolk Public Works  
David Sobel, Antioch University  
Dr. Kipp Rogers, (Former) Norfolk Public Schools, Chief Academic Officer  
Dr. Lawrence Taylor, Norfolk Public Schools, Principal - Chesterfield Academy  
Dr. Linda Rice, Hampton Roads Community Foundation  
Dr. Melinda Boone, (Former) Norfolk Public Schools, Superintendent  
Dr. Michelle Covi, Old Dominion University & VA Sea Grant  
Erica Deale – Mariner’s Museum  
Erik Neil, Chrysler Museum  
Fleta Jackson, Ernie Morgan Environmental Center  
Gretchen Bodner-Edwards, Girls Scouts of Colonial Coast  
Heather Mazzoni, WHRO  
Kim Taylor, Norfolk Public Schools, Parent Liaison - Chesterfield Academy  
Janet Goldbach Ehmer, Elizabeth River Project  
Javier Garringer, City of Norfolk  
Karen Burns, Virginia Aquarium  
Karen Jones Squires, Elizabeth River Project Board  
Kyle Wash, Virginia Zoo  
Laura Nelson, Portsmouth Public Schools  
Larry Atkinson, Old Dominion University Center for Coastal Physical Oceanography

Leigh Evans Davis – Hampton Roads Community Foundation  
Linda Botts, Norfolk Emergency Management/Preparedness  
Lisa Lawrence, Virginia Institute of Marine Science  
Marjorie Mayfield Jackson, Elizabeth River Project  
Mindy Carbonneau, (Former) Elizabeth River Project  
Pamela Braff, Virginia Institute of Marine Science  
Phoebe Crisman, University of Virginia  
Rachel Riesbeck Clark, Virginia Aquarium  
Rebecca Hill, Nauticus  
Rhashida Bess, City of Norfolk – Keep Norfolk Beautiful  
Richard Neefe, Portsmouth Public Schools  
Robin Dunbar, Elizabeth River Project  
Ruth McElroy Amundsen – HR Solar Group, Solar United Neighbors  
Sarah Brennan, (Former) Elizabeth River Project  
Sarah McBride, Elizabeth River Project  
Sarah McGuire Nuss, Virginia Institute Marine Science  
Sarah Schoedinger, NOAA Office of Education  
Sarah Sumoski, (Former) Elizabeth River Project  
Skip Stiles, Wetlands Watch  
Steven Pyle, City of Norfolk  
Tanya K Bhasin, Norfolk School Board  
The Honorable Andria McClellan, Norfolk City Council  
The Honorable Mamie Jackson, Norfolk City Council  
Tim Cole, Virginia Beach City Public Schools

**Special thanks** to *Elizabeth River Project's Youth Resilience Leaders* for lending their voices for a resilient community.



Students from Chesterfield Academy address the kick off meeting of the Youth Resilience Roundtable.



**Elementary:** Chesterfield Academy, Norfolk, Virginia

Amaya Carson  
Amari Smith  
Alijah Harris-Moore  
Christopher Hankins  
Destiny Martin  
Elijah Watford  
Jacoby T. Hill  
Jaquoria Creekmore  
Lamia Hurst  
Lauren Riddick  
Madison Tompkins  
Makayla Brown  
Maleeya Johnson  
Melvin Lowe  
Nyna Brown  
Robert Hughes  
Royal Hughes  
Victoria Riddick

**Middle:** William E. Waters Middle School, Portsmouth, Virginia

Araya Hanscom  
Christian Baker  
Daniel Lopez  
Jashire Moreau  
Konnor Gravel  
Laurie Watson  
Paris Pope  
Sean E. Coe

**High:** Woodrow Wilson High School, Portsmouth, Virginia

Ameire Thomas-Morris  
Dayonce Latrice Bullock  
Jadaquis Williams  
James E. Flippens III  
Kiella Jackson  
Kaire Harris-Chattman  
Mary Riley  
Quinniece Wilson  
Simon Williams  
Tariq Johnson

In addition, we would like to thank Young Life high school students from Portsmouth Public Schools who participated as Youth Resilience Leaders.





## **New! Youth Resilience Clearinghouse**

*Visit Elizabeth River Project's on-line clearinghouse, [www.ElizabethRiver.org/clearinghouse](http://www.ElizabethRiver.org/clearinghouse), for a comprehensive, changing menu of resilience student activities, lesson plans, blogs, news articles, videos, books and field trip opportunities.*

