

# The Elizabeth River Project's **Dominion Energy** **Learning Barge**



**MISSION:** Making restoration of the Elizabeth River a reality.

**AWARD WINNING:** Students learn by doing aboard the 120'x 32' steel deck barge designed by the University of Virginia and owned and operated by The Elizabeth River Project. The barge is a unique and powerful living laboratory for students to learn about river science, the Elizabeth River watershed, ecosystem, stewardship and restoration efforts. As America's Greenest Vessel, her "green" design demonstrates sustainable practices for home and school. Students come aboard thinking globally and leave equipped to make a difference in their community. The Learning Barge's education program received the 2011 Environmental Excellence Award from SeaWorld Busch Gardens, 2014 Governor's Gold Award for Sustainability and 2015 VA Env. Excellence Award from Dept. of Conservation and Recreation.

## 2019-2020 **GreenSTEM** **RIVER RESILIENCE** **Project Blue Crab**



*Callinectes sapidus*

**NEW PROGRAM:** To foster river stewards and teach resilience, students perform a scientific field investigation to answer, "**How could sea level rise and increased flooding affect me, the blue crab and my community, and what actions can I take to help?**"

To begin, students are divided into small groups and rotate to six learning stations performing hands-on activities, identifying species, gathering and recording data and utilizing tools like field scopes, secchi discs, monoculars and water quality equipment.



**SAFETY:** The barge is Coast Guard certified and stays tied to a dock during the entire program. One chaperone or teacher is recommended per 10-15 students.

## IDEAL GROUPS

20-60, preK-university (90 maximum)  
Public, private and home schools  
youth organizations and scouts

## TO SCHEDULE

Email Robin Dunbar, Deputy Dir. – Education  
[rdunbar@elizabethriver.org](mailto:rdunbar@elizabethriver.org) or call 757-392-7132  
You can also fill out a Request Form found at  
[www.elizabethriver.org](http://www.elizabethriver.org) (Learning Barge Page)

**Helpful information** to provide when scheduling:

- 1.) How many students
- 2.) Grade level of students
- 3.) Season or month interested in
- 4.) Name of school and your contact info.

## PROGRAM TIMES

Monday – Friday. Closed holidays.  
Must reschedule if raining or extreme weather.

### Typical time slots:

9:30-11am or 10-11:30am  
11-12:30pm or 11:30-1pm

### Seasons include:

Fall: Oct. 1 – Dec. 13  
Spring: April 1 – June 8  
Summer: To be determined.

## TEACHER RESOURCES

Additional activities are available at  
[www.elizabethriver.org](http://www.elizabethriver.org)

**PRICE** (Sliding Scale – You choose.)

\$9-\$12 **1.5 hour** program

\$14 for out of area schools

NEW pricing – Please contact Robin Dunbar, [rdunbar@elizabethriver.org](mailto:rdunbar@elizabethriver.org) to discuss pricing and sliding scale. Sliding scale based on your budget. Teachers and chaperones are free. We will do our best to work with your budget.

## DOCKING SITE

Grandy Village Learning Center  
2971 Kimball Loop Terrace  
Norfolk, VA 23504

## WHAT TO BRING

Sunscreen, water bottle, hat, jacket/  
raincoat, closed toe shoes.

## SNAIL MAIL THE CREW

Students are encouraged to SNAIL MAIL the barge crew by writing a letter and sharing what they will do to support a healthy river. Write: The Learning Barge Crew, The Elizabeth River Project, 475 Water Street, C103A, Portsmouth, VA 23704.





## VIRGINIA STANDARDS OF LEARNING

**SCIENCE:** **K:** 1,4, 5, 6, 8, 9,10 **1:** 1, 2, 3, 4, 5, 6, 7, 8 **2:** 1,4, 5, 6, 7, 8, **3:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11  
**4:** 1, 3, 4,5, 6,7,8 **5:** 1,4, 5, 6, 7 **6:** 1, 2, 3, 4, 5, 6, 7, 8, 9 **LS:** 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,  
14, **PS:** 1, 2, 5,6, 10, 11 **ES:** 1, 2, 3, 7, 11, 13 **Biology:** 1, 5, 8, 9

**MATH:** **K:** 6, 8, 10, 13 **1:** 2, 5, 14 **2:** 1, 3, 5, 6, 14 **3:** 1, 3, 4, 13 **4:** 1, 4, 6, 7, 8, 13 **5:** 1, 2, 4, 5  
**6:** 2, 6 **7:** 3 **8:** 3

**HISTORY:** **K:** 2, 3, 4, 5, 8, 9 **1:** 1, 4, 5, 7, 8, 10, 11, 12 **2:** 3, 5, 6, 7, 10 **3:** 2, 4, 6, 7, 8 **VA:** 1, 2  
**Geography:** 1

### LANGUAGE

**ARTS:** **K:** 1,2, 3, 4, 6, 10 **1:** 1,2, 3, 4, 9, 11,12 **2:** 1,2, 3, 6, 7, 8,9,11 **3:** 1,2,5,6 **4:** 1, 2,3 **5:** 1, 2  
**6:** 1 **7:** 1 **8:** 7

**ART:** **K:** 2, 3, 5, 8, 10, 11, 12, 13, 14, 15, 18 **1:** 2, 3, 4, 5, 8, 9,12, 15, 16, 18, 19, 20 **2:** 4, 5, 6, 9, 10,  
13, 14, 18, 22 **3:** 2, 4, 5, 10, 14, 16, 17, 23, 24, 26, 27, 28 **4:** 2,3,5, 6, 8 10, 13, 20, 23, 24 **5:** 1,  
2, 3, 4, 9, 10, 16, 25, 29 **6:** 2, 6, 15, 17, 18, 21 **7:** 3,4,9,10,24, 27 **8:** 5,  
6. 13. 14. 16. 20

## 21<sup>st</sup> CENTURY SKILLS

**Students rotate through six multidiscipline learning stations that:**

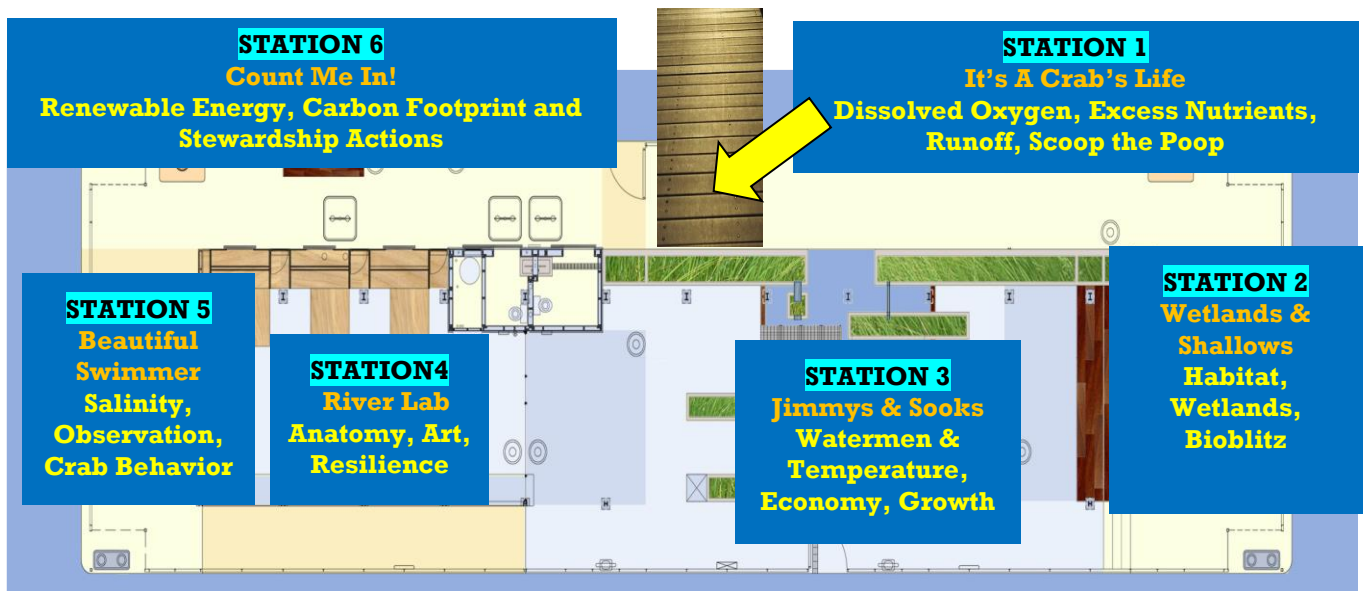
- are designed to excite youth about their home river;
- offer an opportunity to discover and explore;
- are research-based utilizing real-world restoration projects;
- utilize critical thinking and problem-solving to stimulate senses and spark curiosity;
- foster a generation of stewards empowered to care for the Elizabeth River.

**Curriculum addresses Virginia Standards of Learning** in science, language arts, math, history and art. Students explore, analyze, map, gather data, graph, identify, predict and compare results. Program begins with a research question and concludes with reflection.

# THE BLUE CRAB



- **The Blue Crab is a 10-legged crustacean that walks sideways** using its three middle pairs of legs and uses its sharp front claws for protection and hunting.
- **The crab's scientific name means "beautiful swimmer."**
- **Gender can be determined by looking at the shape of the underbelly of the crab's apron.** Narrow shape (male); Broad shape (female). Female's claw tips are red.
- **Female crabs seek out the saltiest part of the bay (the mouth of the bay)** to have their babies. Most of the bay's blue crabs are born in or near the Elizabeth River!
- **Adult crabs are omnivorous** and feed on bivalves, crustaceans, fish, marine worms, plants and detritus.
- **The blue crab is one of the most economically important shellfish** in the Chesapeake Bay and recently has been in decline. Learn how you can help! [www.elizabethriver.org](http://www.elizabethriver.org)



## 6 LEARNING BARGE STATIONS



# LEARNING STATIONS

**Students investigate:** *“How could sea level rise and increased flooding affect me, the blue crab and my community, and what actions can I take to protect the future of the blue crab and my community?”*

## Beautiful Swimmer

### Salinity, Observation, Crab Behavior

Students answer, *“Sea level rise might affect the Elizabeth River’s salinity. How might that affect the Elizabeth River’s plants & animals?”*

Students learn how the Elizabeth River gets its brackish water and why salinity is important for blue crab behavior. They test the salinity at the barge site to decide whether they are more likely to find adult crabs or juvenile crabs. Students observe live blue crabs and learn how they swim, eat and even regenerate appendages.



Blue Crab, *Callinectes sapidus*, translated from Latin means “beautiful savory swimmer.”



Heron eating blue crab.

## Wetlands & Shallows

### Habitats & Bioblitz

Students learn about the importance of wetland grasses for Blue Crabs and the Elizabeth Rivers food chain while answering the question, *“How do you think sea level rise and flooding could affect wetlands?”* They learn that wetland grasses serve as habitat to around 40% of all animals, and how wetlands help filter out pollutants in the river. They discuss how rising seas can impact habitat, the value of wetlands and what they can do to help. They’ll get their hands wet as they explore various animals that contribute to the rivers food chain while learning how to bioblitz.

## River Lab

### Anatomy, Art, Resilience

Students build crab models with colored sea glass while listening to a crabby, sideways walk song. They learn what makes a crab a crab and answer *“How might sea level rise impact the Atlantic Blue Crab’s anatomy?”* Students learn about how a crabs exoskeleton helps them be resilient and how fossil fuels and carbon dioxide can affect the thickness of their shells. They learn that blue crabs molt 18-30 times making them vulnerable to predators for the 2-3 days it takes for their shells to harden.



## Jimmys & Sooks

**Watermen, Economy, Temperature & Growth:** Students learn the importance of the blue crab in the Chesapeake Bay while answering, *“How do crabbing regulations protect the Atlantic Blue Crab population and our economy?”* They learn how local watermen identify the crabs by color, size, weight and gender by becoming junior watermen for the day. Students examine how crab pots are engineered and the different methods used for crabbing. They learn how water temperature promotes growth in blue crabs. They also compare the blue crab’s population size over the years and hypothesize why we’ve seen a decrease in their numbers after looking at a graph.



## It's a Crab's Life

**Dissolved Oxygen, Excess Nutrients, Runoff, Scoop the Poop:** Students learn about and measure the river’s dissolved oxygen while answering, *“How could warming water temperatures and excess nutrients impact animals like the Atlantic Blue Crab?”* Students discover how we impact dissolved oxygen for marine animals like the blue crab. Students will understand how reducing runoff, greening schoolyards and scooping the poop can help lessen excess nutrients from going into our river.

## Count Me In!

**Reduce Energy, Carbon Footprint, Renewable/ Nonrenewable & Stewardship:** Students learn how the Learning Barge is off the grid and harnesses energy from the wind and sun. They learn how to reduce their energy consumption, the difference between renewable/ nonrenewable energy and answer, *“Actions to help reduce sea level rise in my community are \_\_\_\_\_ ?”* Students observe how the Learning Barge captures and reuses rain water and has composting, waterless toilets.



# Dominion Energy

**Batten Educational Achievement Fund of Hampton Roads  
Community Foundation**

**BWET ~ National Oceanic Atmospheric Administration**

**Chesapeake Bay Restoration Fund Advisory Committee – Made possible by  
the Sale of Chesapeake Bay License Plates**

**Colonna's Shipyard  
Dollar Tree Foundation**

**Norfolk, Portsmouth, Chesapeake & Virginia Beach Public Schools**

**Norfolk Redevelopment and Housing Authority  
SeaWorld & Busch Gardens Conservation Fund  
Virginia Natural Gas  
Virginia Pilot Association**

**The Maintenance Advisory Committee's generous in-kind support keeps our barge floating!**

**BAE Systems - Norfolk Ship Repair**

**Coastal Services**

**Crofton Industries & Diving**

**Earl Energy, Inc.**

**East Coast Steel Fabrication, Inc.**

**Ireland Marine, Inc.**

**Marine Chemist Atlantic**

**Matherne Marine Design, Inc.**

**MHI Ship Repair and Services**

**Michael Petrus and Phoebe Crisman**

**Norfolk Tug Co., Inc.**

**Robbins Maritime, Inc.**

**Solar Services, Inc.**

**Virginia Ship Repair Association**

**Yacht Systems Services**



**475 Water Street, C103A  
Portsmouth, VA 23704**

## **MORE INFORMATION**

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**www.ElizabethRiver.org**