

Watershed STEM Spotlight

Boxerwood Education Association, Virginia

Partnership with 21st Century Community Learning Center Sites

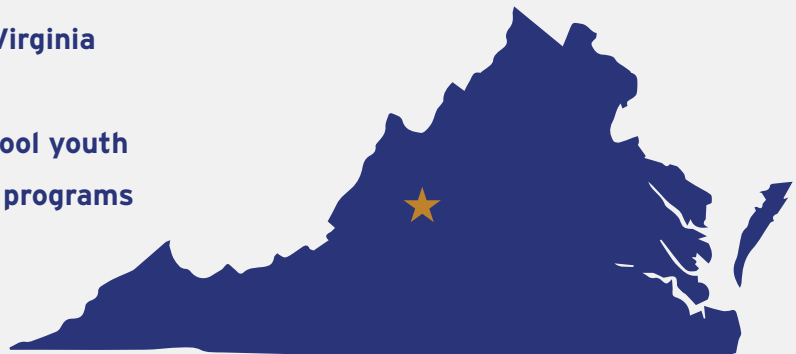
Boxerwood staff worked directly with three [21st Century Community Learning Center](#) (21st CCLC) partners to plan individualized environmental education activities for each 21st CCLC site that allowed youth to connect with and investigate local bodies of water. Boxerwood staff led the design and facilitation of activities with youth, while 21st CCLC site staff supported activities by providing additional

staff and arranging transportation. Boxerwood and its 21st CCLC partners had worked together in the past, and this grant allowed that relationship to grow. At the same time, this partnership helped the 21st CCLC sites meet their goals while gaining a better understanding of and appreciation for outdoor learning as a way to promote both STEM and social and emotional learning goals.

About Boxerwood Education Association

[Boxerwood Education Association \(Boxerwood\)](#) is a nonprofit organization that provides [environmental education programs](#) to its rural community. Working closely with all preschools and public school divisions in their county, Boxerwood engages over 2,500 students, ranging from preschool through 12th grade, in nature-based experiences each year. Boxerwood offers school day field programs, after-school programs, and summer camps. Boxerwood also engages local citizens in educational conservation action programs, community tree-planting, composting challenges, and a homegrown carbon-offset marketplace. It bases its operations at a 15-acre woodland garden, open to the public without charge.

- **Rockbridge County, Lexington, Virginia**
- **Chesapeake Bay watershed**
- **500 elementary and middle school youth**
- **After-school and summer camp programs**
- **Three 21st CCLC sites**



What Was the Project?

Boxerwood focused on connecting 21st CCLC youth to their local watershed. A key goal of this program was to introduce rural youth to watershed learning through new outdoor recreation opportunities, thereby strengthening their own sense of self-efficacy and affinity to their community. Specifically:

After-school Activities

Elementary youth: Over seven weeks, youth learned about the connection between watersheds, recycling, and helping ocean life. They then created a puppet show showcasing what they learned, which was filmed and shared with the public.

Middle school youth: Youth spent seven weeks learning the basics of fly fishing and then went on the river to practice their skills. Fishing was used to connect youth to the local river and aquatic ecosystems and their care.



Fishing was used to connect youth to the local river and aquatic ecosystems and their care. *Photo: Elise Sheffield*

Summer Camp Activities

Elementary youth: Youth spent three days at a local river park to learn how their actions in the mountains can impact aquatic life in the ocean. As part of the investigation, they participated in activities such as aquatic chemistry, macroinvertebrate identification, and watercolor painting, and they also planned and carried out a litter cleanup along the river. A final showcase attended by families and school administrators along with letters written to park campers allowed youth to share what they learned.

Middle school youth: During a weeklong camp, youth engaged in STEM investigations while kayaking and canoeing at a local lake. Youth tackled the question, "What is the best place to fish for large-mouth bass at Lake Robertson?" They also completed a lake habitat assessment, made predictions, and tested their hypotheses during several hours of lake-based activities.

Key Successes

By learning about, observing, and connecting with nature, 21st CCLC youth discovered how their actions have local and broad environmental impacts. 21st CCLC youth created books and videos and wrote letters about the importance of caring for the environment and shared these materials with the public. Summer camps were an especially engaging and immersive model for achieving this outcome. Outdoor experiences also offered opportunities for social and emotional learning, which reinforced the 21st CCLCs' goals of supporting the whole child.

"We created camps where students felt good about themselves and their place in the natural world. We saw a lot of happiness: first fish caught, first hike to a waterfall, first boat paddled, first book published, knowledge of how to do benthic testing and identify macro-invertebrates, pride in showing off work to parents at an end-of-camp showcase."

—Elise Sheffield, Boxerwood Education Director



Youth engaged in STEM investigations while kayaking and canoeing at a local lake. Photo: Elise Sheffield

Lessons Learned

As each 21st CCLC partner is different in terms of their goals, constraints, and assets, Boxerwood staff learned to remain flexible and responsive, tailoring activities to the realities of each 21st CCLC site. One challenge Boxerwood staff faced was sporadic after-school attendance, especially at the middle school level, which made it difficult to implement activities that built on each other across sessions. Boxerwood focused on offering multiple opportunities for outdoor field experiences to connect youth with nature, even if youth missed previous sessions. The experience also reaffirmed the value of summer camps for creating a sustained learning experience.

Beyond the Grant

There is a strong foundation for future work based on the activities offered and the ongoing partnership opportunities. Each 21st CCLC partner expressed interest in continuing their collaboration with Boxerwood to grow the types of outdoor field-based

experiences offered to youth. The grant also allowed Boxerwood to hire additional part-time staff who continue to support these endeavors, thus building the organization's own capacity as an environmental education provider. Boxerwood also used what it learned from this program to test out new activity ideas, gain confidence in making connections to larger environmental issues, and expand the types of programs it offers.

Boxerwood is exploring how it can continue to use the idea of watersheds and caring for the environment to deepen its offerings, using its position in the community to continue engaging local youth in this topic. Whether through a tree planting, a bioblitz, or additional summer camps and after-school programs, Boxerwood is continuing to engage youth via multiple touchpoints, helping them connect with nature and grow as environmental stewards.

This project was funded under the Watershed STEM Education Partnership Grants program, a collaboration between NOAA, NAAEE, and the U.S. Department of Education to support enriching after-school programming at Nita M. Lowey 21st Century Community Learning Centers around the country. Learn more at: naaee.org/programs/eeblue/21CCLC.