

## MWEE Case Study Frederick County Public Schools, VA



***FCPS fosters collaborative teacher teams that engage students in environmental and geographic literacy***

### **1. About FCPS**

Frederick County Public Schools is the 23rd largest school division in Virginia. The division is located in the northern Shenandoah Valley and is a part of the Shenandoah River Watershed. FCPS is unique in that the school locations vary from rural, to suburban, and even include some urban areas as well. The school division serves close to 14,000 students in 21 schools. The student body demographics are 69.7 % white, 19.4 hispanic, and 4.1% black. Of the total student population, 34.3 % of students are considered economically disadvantaged and 13.7 % are students identified with disabilities.

The division is committed to watershed education and the inclusion of Meaningful Watershed Educational Experiences throughout the curriculum. As such, there is a dedicated MWEE experience for all 6th grade students in the division. FCPS is an innovative community where caring relationships and authentic learning inspire all students.

### **2. FCPS Environmental and Geographic Literacy Program: I-ASC**

*I-ASC: Investigate-Analyze-Synthesize-Communicate*

Blandy Experimental Farm, (BEF, a University of Virginia field ecology research station) partnered with FCPS teachers to create field investigations aligned with classroom learning. Teachers were challenged to help students make ecological, social and economic connections between our headwaters region in the Shenandoah Valley and the Chesapeake Bay estuary. The goal of the I-ASC project was to engage students in learning how to make informed decisions that balance the needs of the community, history, geography, people, and the environment. In the initial stages of the project, teachers collaborated across content areas to develop activities where students investigated the implications of building a new education center at Blandy Experimental Farm. Students investigated potential locations and then asked to analyze the impact of each location in terms of the needs of the education center, the history of Blandy Experimental Farm, the needs of the school divisions and students, and finally the impact the new building would have on the environment. In the later stages of the I-ASC project,

cross-curricular teacher teams from each school developed their own MWEE and action project based on their local school environment.

### **3. Program Highlights**

- Interdisciplinary problem-based learning that utilized integrative teaching strategies which incorporated aspects of the MWEE into all content areas
- FCPS and BEF utilized a co-teaching model in which educators collaborated on MWEE planning, lesson designs, and instruction
- Systemic MWEE PBL: all 6th grade core teachers & all students participated (approximately 1000 students per year); this included students with disabilities, at-risk students, and English language learners.
- Students completed real world investigations of the local environment using a human-environmental systems approach.
- Teachers and students made connections between outdoor and indoor classroom learning experiences.
- Changes in teacher practice and self-efficacy led to sustained MWEE and action plans.

### **4. Developing Environmental Stewards**

Sixth grade students at all four FCPS middle schools engaged in interdisciplinary MWEE PBL that emphasized both environmental and geographic literacy principles. Students gained understanding about the interconnections among natural and human systems and applied this understanding to identify action projects relevant to their individual schools. Students were challenged to make decisions that balanced the needs of their school with the needs of the environment.

At their individual schools, students investigated how their school managed the landscape and water resources. Each school conducted a site analysis to identify potential problems or environmental concerns. At one school, students discovered that water had been diverted from a wetland. Students and teachers requested that the school division restore this wetland when the new high school is built. At another school, students realized that the area that was proposed to expand their school was subject to flooding. They informed their school administrators of this problem and suggested an alternative site for the expansion. At a third school, students realized that run-off from the impermeable surfaces at their school carried sediment, oil, trash, and other potential pollutants. These students proposed and successfully planted a stormwater run-off, native plant garden between the impermeable surface and a road. At the fourth school, students became acutely aware that water is a precious resource that should not be taken for granted. They explored how their school managed water resources and created an informational 15-station self-guided tour of their school grounds to explain the school's best management practices for water.

## **5. Lessons Learned**

- Engage the school principals in project conception and design BEFORE going forward with development of a project proposal. It is difficult to succeed in fulfilling project goals and objectives without school administration support.
- Guide teachers to discover the content and process skills connections among their disciplines and challenge them to create MWEE PBL components pertinent to their content areas. Initially, teachers did not understand the natural connections among their disciplines.
- Anticipate barriers when initiating new MWEE projects that involve collaboration between different groups of teachers and informal educators. The key to success is:
  - Respect: listen to all voices
  - Engage in collaborative solutions
  - Focus on the overall goals
  - Be flexible
  - View challenges as opportunities
- MWEE's benefit from offering diverse pathways through multiple content areas for students and teachers to explore. Connections can be made through historical documents, stories, and hands-on investigations.

## **6. Quotes from Teachers**

- "The integration of literature and the writing into a predominately strong math and science topic was important and meaningful. I think that it showed the kids, and maybe even the teachers, that communication skills are important in all aspects of learning and not just in the English classroom."
- "My geoliteracy and envioliteracy have both increased as a result of participating in this program. I have a more clear understanding of watersheds and how they work, as well as the role they play in the health of the community where I reside and the condition of the Chesapeake Bay."
- "I have learned more about how everyday decisions affect the environment and how we should consider these impacts in everything we do."

## Environmental Literacy Activities



Teacher Professional Development September 2014. Teachers build and test systems to reduce runoff and maximize groundwater recharge.



April 2015. Aylor Middle School 6th graders test the chemical parameters of their water sample to determine water quality.



## Geoliteracy Activities



April 2015. Aylor Middle School 6th graders identify architectural scars that indicate a prior entrance on the historic slave quarters building, a primary source.





October 2015. 6th grade students from Aylor Middle School excavate and analyze artifact assemblages and documents to reconstruct the history of a stone chimney remnant.