



Meaningful Watershed Experiences for Middle and High School Students

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Prince William County Public Schools and George Mason University in Virginia, USA, partnered to provide Meaningful Watershed Educational Experiences (MWEEs) for over 25,000 middle and high school students (11-18 year olds) across 34 schools. This school district, situated in a rapidly growing region 55 km southwest of Washington DC, has over 82,000 K-12 students. As native forest cover has been replaced with farming and urbanization, water quality has significantly degraded in the 166,534 km² Chesapeake Bay watershed. This project was designed to increase student awareness of their impact on the land and waters of the largest estuary in the United States.

MWEE is a long-term comprehensive project that incorporates a classroom preparation phase, a hands-on outdoor field investigation, and a reflection and data-sharing component. Training and technical assistance enhances the capacity of teachers of 6th grade, high school Earth Science and Environmental Science to deliver MWEEs which includes schoolyard stewardship, inquiry driven field study, use of hand-held technology and computer based mapping and analysis, project sharing and outreach.

George Mason University researchers worked closely with K-12 science educators to create a comprehensive watershed-focused curriculum. Graduate and undergraduate students with strong interests in environmental science and education were trained to deliver the field investigation component of the MWEE. Representative teachers from each school were provided 3 days of professional development and were responsible for the training of their school's science education team. A comprehensive curriculum provided teachers with activities and tools designed to enhance students' mastery of state science objectives. Watershed concepts were used as the unifying theme to support student understanding of curriculum and STEM objectives including: scientific investigation, data collection and communication, chemistry, energy, erosion, human interaction with the environment, land use, and decision making based on cost-benefit analysis. Through this program, students make the connection that the health of their local schoolyard will affect the health of the Chesapeake Bay watershed.

Groups ranging from 65 – 150 students per day travel to either Occoquan Bay U.S. Fish and Wildlife Refuge or Manassas National Battlefield Park for their field investigation. During the investigation, learners rotate through up to four different 45-minute stations led by GMU students and/or retired science schoolteachers. Depending on the field site visited, stations include water chemistry testing, benthic macroinvertebrate collection and identification, wetland functions, watershed topography and water conservation. Thus this experience raises students' understanding of their place within the Chesapeake Bay watershed and their impact on local and regional ecosystems. Additionally, this field investigation directly increases university students' ability to successfully immerse the public in discussions of complex science topics as well as engage them in hands-on learning experiences.

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