

## **PA Chesapeake Bay Meaningful Watershed Educational Experience Grant Program for Conservation District – School Partnerships**

Funding provided through the Federal NOAA B-WET Program

**Final Report: January 1, 2010 – June 30, 2011**

**Ten projects were funded during this grant round:** *(final reports start on page 2)*

- MWEE101101 Raising Conservation Conscious Citizens by Restoring Riparian Buffers – Blair County Conservation District partnered with Altoona School District *(In Progress)*
- MWEE101102 PA Chesapeake Watershed Youth WIPs – Bradford County Conservation District partnered with Canton School District *(In Progress)*
- MWEE101103 Project Millbrook Marsh: A Meaningful Watershed Field Experience – Centre County Conservation District partnered with State College School District *(Completed)*
- MWEE101104 Spring Environmental Days – Centre County Conservation District partnered with Penns Valley School District *(Completed)*
- MWEE101105 Making a Connection: Pennsylvania Watersheds to the Chesapeake Bay – Dauphin County Conservation District partnered with Susquehanna School District *(Completed)*
- MWEE101106 Streamside Eco Days – Franklin County Conservation District partnered with Chambersburg School District *(Completed)*
- MWEE101107 My Journey, My Experience, OUR Watershed – Franklin County Conservation District partnered with Chambersburg School District *(Completed)*
- MWEE101109 Outdoor Education Program – Snyder County Conservation District partnered with Selinsgrove Area School District *(Completed)*
- MWEE101110 NPS Pollution Exploration & Watershed Protection Program – Union County Conservation District partnered with Union County Homeschoolers *(Completed)*
- MWEE101111 Nature Trail and Outdoor Classroom – York County Conservation District partnered with Red Lion School District *(In Progress)*



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## Final Reports for Completed Projects:



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**Project Title:** MWEE101103 Project Millbrook Marsh: A Meaningful Watershed Field Experience

**Funding:** \$5,000

**Conservation District:** Centre

**School District:** State College

**School:** Corl Street Elementary School

**Summary:** Grant funds were used to pay site fees for students to visit the Millbrook Marsh Nature Center in the spring of 2011. Additionally, funds were provided to purchase wetland equipment to support the ongoing partnership between State College Area School District and the Marsh.

### Students:

How many students in which grades were targeted through this project?

Approximately 1,000 students

What percentage of each grade's total student body do these numbers represent?

100% Kindergarten Students and 50% of Grades 1-2 Students

### Project Overview:

1. In what ways did the project include hands-on watershed activities that strengthen a student's connection with the PA portion of the Bay, their local rivers and streams, and instill a stewardship ethic?

Students experienced the Marsh by participating in hands-on, minds-on activities provided through the programs, *Wetland Senses* (kindergarten) and *Marsh Explorations* (grades 1 and 2).

2. b. In what ways did those activities expand a student's knowledge of the PA portion of the Chesapeake Bay watershed and its rivers and streams?

Students explored, first hand, the role that Millbrook Marsh plays as part of the Chesapeake Bay watershed.

- c. How were the classroom activities integrated into the school's curriculum?

In both Kindergarten and in Grades 1 and 2, the Marsh visit is written into the integrated Social



Studies/Science units, *Spring* (kindergarten), and *Wetlands* (grades 1 and 2)

3. Was the project led by knowledgeable teachers, educators, and/or organizations familiar with providing meaningful Chesapeake Bay watershed experiences? Please describe:

Field experiences to the Marsh were organized through the State College Area School District Curriculum Office, supported by Learning Enrichment teachers and Classroom Teachers.

4. Did the project involve the community or other partners that expand the influence of the project? If yes, please explain.

Additional support for the field experiences was provided by Clearwater Conservancy.

5. In what ways might it be possible to measure long-term outcomes of the project?

These trips are part of a district wide partnership with Millbrook Marsh in which students will continue to expand their knowledge of the Chesapeake Bay watershed throughout their elementary years, K-5.

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**Project Title:** MWEE101104 Spring Environmental Days

**Funding:** \$4,654

**Conservation District:** Centre

**School District:** Penns Valley School District    **School:** Penns Valley Elementary School

**Summary:** Nine years ago, an Environmental Education Coordinator was hired by the Penns Valley Conservation Association to conduct watershed-based activities in K-12 classrooms, and to coordinate the **Spring Environmental Days for the Penns Valley School District. Under this Coordinator's organization,** Spring Environmental Days have grown into a highly meaningful program, embraced by teachers and administrators as well as students.

The "Spring Environmental Days" MWEE grant from the Conservation District was used to assist the Environmental Education Coordinator in organizing the 2011 Spring Environmental Days activities for grades K-8. During the course of these Spring Environmental Days, students from all schools in the district participated in a series of watershed-based, experiential education activities.

The goals of this project were achieved by reaching over 900 students and 33 teachers from April 20<sup>th</sup> to June 7<sup>th</sup> this year. **The Coordinator organized and led a variety of different 'Days,' each catered to meet** the needs of the different grades and classrooms. Some activities took place on the school grounds to teach students about what they see around them every day, while other activities took place at local wetland, stream, and farm locations. Over 40 different activities were used in total to teach students about watersheds, pollution, animal and plant adaptations, and more. This year the coordinator was also able to reach the special needs students in new and exciting ways, including an Environmental Day specifically tailored to the needs of students on the Autism spectrum.

The main roadblock encountered this year was the sudden unexpected closing of the Penns Valley Environmental Center—a forested area behind one of the schools where many Environmental Days are usually scheduled. The activities planned for these days had to be changed in order to accommodate new locations, and the 8<sup>th</sup> grade teachers decided they did not want to participate in a day if it could not be at the Environmental Center. This meant that grades K – 7 were reached this year instead of grades K – 8 as originally intended.

In the future, it may be helpful to have Environmental Days take place throughout the year instead of all at the same time in the spring. Some teachers expressed an interest in this as it would help them better



match *when* the students learn certain environmental topics with the date of their Environmental Day. It can also be difficult to schedule the Environmental Days at the end of the school year, as many other field trips and specials take place during the same time.

### **Students:**

How many students in which grades were targeted through this project?

From April 20<sup>th</sup> to June 7<sup>th</sup>, the Spring Environmental Day project reached over 900 students, 33 teachers, and 2 administrators.

**What percentage of each grade's total student body do these numbers represent?**

The Spring Environmental Day project targeted all Penns Valley School District students in kindergarten through 8<sup>th</sup> grade. One hundred percent of the students in grades K – 5 and 7 were reached, including those with special needs. Due to unforeseen circumstances, the location intended for 6<sup>th</sup> and 8<sup>th</sup> grade Environmental Days was closed shortly before it was to be used. Alternatives were offered by the environmental education coordinator, but only one of the 6<sup>th</sup> grade teachers took this opportunity and thus only 20% of this grade was reached. In spite of these complications, all teachers said they would like to participate in Spring Environmental Days again next year.

### **Project Overview:**

1. In what ways did the project include hands-on watershed activities that strengthen a student's connection with the PA portion of the Bay, their local rivers and streams, and instill a stewardship ethic?

In order to make Environmental Days a success the Environmental Education Coordinator works closely with the teachers and community members of Penns Valley to create hands-on, engaging outdoor experiences. Many activities relate directly to the science and health of local and global watersheds. Some activities are anchored in other topics, like learning where our food comes from at a local farm, or exploring the soil, but are taught in a way that shows children how all we do affects everything else, and how stewardship and a caring attitude can help keep the world healthy in the future.

As mentioned above, many activities are directly related to the watershed and how to keep it clean **and safe for future generations. For example, a "Paper Watershed" activity** helps students design their own watersheds with roads, rivers, and towns, and then watch the way the pollution from the man-made areas affects the streams and wetlands. Some Spring Environmental Days take place at a local wetland, and teach students that what we do in Penns Valley affects many other people and animals throughout the Chesapeake Bay watershed. Another favorite activity is to teach students how to look for macroinvertebrates in streams and how to interpret stream health based on what they find.

Every Environmental Day ends with a discussion of how students can work to help make the natural world a better place, including examples like picking up litter along streams, recycling, and talking to their parents and neighbors about what they learned.

2. a. **Please describe the project's pre and post classroom activities/evaluations:**

Spring Environmental Days provide students with hands-on activities that enhance what they learned about science and the environment throughout the year. In addition to the activities performed on these days, the Coordinator visits the classroom at other times of year in order to present engaging



activities to the class and help prepare the students for what they will see during Spring Environmental Days at the end of the school year. In the 2010-2011 school year, the Coordinator performed over 20 different activities with students prior to the Spring Environmental Days. These activities give students more opportunities to apply their knowledge, and allow them to perform more difficult and comprehensive activities during Environmental Days.

A variety of assessment tools were used to gain information about the success of the Spring Environmental Day project. A survey was sent out to participating teachers after their Environmental Day asking how well the activities fit in their curriculum, how engaged they felt the students were, what they would like to see next year, and more (see supplemental materials for examples).

Another assessment tool we used was having students write letters to a family member or friend telling them about what they learned during their Environmental Day (see supplemental materials for examples). They were required to include at least three pieces of information: something specific they learned, their favorite part of the day, and something they would like to learn more about in the future. Through these letters the Coordinator is able to see which parts of the day stood out to them the most, which concepts they understood thoroughly, and which concepts they are having difficulty with. For example, after a 4<sup>th</sup> grade macroinvertebrate activity, the Coordinator gleaned from the **letters that students were still confused about the terms "pollution tolerant" and "pollution sensitive."** As a result, she will explain these concepts more carefully in the future.

**b. In what ways did those activities expand a student's knowledge of the PA portion of the Chesapeake Bay watershed and its rivers and streams?**

Before Spring Environmental Days, many of the younger students (5<sup>th</sup> grade and below) were not aware that Penns Valley is located within the Chesapeake Bay watershed. Through the different activities, they learned that Penns Valley is just one part of a bigger system, and that what we do to our rivers and streams here affects many other people, plants, and animals in the Chesapeake Bay watershed and around the world. They also learned how to identify some of the macroinvertebrates, invasive species, and native plants and animals living in the Chesapeake Bay watershed. In addition to teaching the younger students about the Chesapeake Bay watershed for the first time, we also expanded on the knowledge of the older students, building on what they have learned in previous years. This gave the students a greater depth to their knowledge on the Chesapeake Bay watershed and how it impacts the environment both locally and globally.

**c. How were the classroom activities integrated into the school's curriculum?**

The activities performed during Spring Environmental Days are tied closely to Pennsylvania Academic Standards, and have been tested with teachers over time to ensure they fit in well with the current curriculum. These activities are also available for teachers to use in the classroom on their own at any time on our website (launched Summer 2010) at [www.treeonline.wordpress.com](http://www.treeonline.wordpress.com).

3. Was the project led by knowledgeable teachers, educators, and/or organizations familiar with providing meaningful Chesapeake Bay watershed experiences? Please describe:

The Penns Valley Conservation Association has always served as a steward for the local watersheds in Penns Valley and the larger Chesapeake Bay watershed in which it is contained. The Environmental Education Coordinator also has extensive knowledge of science, the environment, and the Chesapeake Bay watershed. This knowledge was obtained through a Bachelor of Science degree, experience working with other environmental groups, and through continuing education experiences provided by PVCA and Environmental Concern, a wetland restoration company specializing in the



Chesapeake Bay watershed.

Other knowledgeable educators were also brought in as volunteers and activity leaders, including experts from the Conservation District, Master Gardeners, PASA, and Pennsylvania State University.

4. Did the project involve the community or other partners that expand the influence of the project? If yes, please explain.

Spring Environmental Days would not be possible without the help of a variety of dedicated volunteers and community members. This year, 14 people logged over 110 volunteer hours assisting with activities and leading the students between stations. These volunteers come from many different backgrounds, and include PVCA members, PTO/PTA members, local landowners, and Master Gardeners. Their assistance with Spring Environmental Days help the students greatly, but also help the community become more aware of and invested in the work being done in the schools.

5. In what ways might it be possible to measure long-term outcomes of the project?

One of the best ways to measure the long-term outcomes of this project is to maintain conversations with high school science teachers about the abilities of the students coming to them who had these activities in elementary school versus those before them who did not. It is also possible to track the Pennsylvania System of School Assessment results for the science exams over time and see if students show an improvement after being involved in the Spring Environmental Days program.

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**Project Title:** MWEE101105 Making a Connection: Pennsylvania Watersheds to the Chesapeake Bay

**Funding:** \$3,695

**Conservation District:** Dauphin

**School District:** Susquehanna

**School:** Londonderry School

**Summary:** The 7th/8th grade student curriculum is based on the Environment and Ecology standards for the state of Pennsylvania. The course is primarily hands-on and relies heavily on outdoor experiences that connect to classroom instruction. The final field study for this year took place at the Karen Noonan Center in Crocheron, MD. This residential field study lasted for three days and two nights and was possible due to funding from this grant.

**Students:**

How many students in which grades were targeted through this project?

17 seventh and eighth grade students went on the trip.

**What percentage of each grade's total student body do these numbers represent?**

This is 94% of the class.

**Project Overview:**

1. In what ways did the project include hands-on watershed activities that strengthen a student's connection with the PA portion of the Bay, their local rivers and streams, and instill a stewardship ethic?

One of the first activities involved orienting the students as to where they were in reference to the



Bay and where the Susquehanna flowed into the Bay. Students were surprised to learn that the Susquehanna River is the largest contributor of fresh water to the Bay. The counselors referred to the Susquehanna as the Mother River to the bay. This really helped impress upon the students the importance of their daily living actions. We discussed pollutants and over-fertilization issues that pose a problem for the Bay.

2a. Please describe the **project's pre and post classroom activities/evaluations:**

In an effort to prepare students for the trip classroom instruction time was spent learning about aquatic biomes. Students were assigned reading materials as well as review worksheets to be sure they had enough background knowledge to get the most from the field study. The students **completed an activity designed by the American Meteorological Society called, " Surf Your Watershed."** This online activity used the **Environmental Protection Agency's website to introduce the** concept of watersheds and what watersheds students in Harrisburg, PA are a part of.

A week and a half after our return, the students met at school. We watched an I-movie put together by one of the students with the pictures that her mother took during our trip. Each student was also **given a copy of the pictures on a disc. I have included a copy. During this "Back from the Bay night"** I asked questions to check their cognitive recollections. I was surprised that instead of groans and protests about school being out for the summer, I had students recalling the water cycle, hydrologic regime, how oysters help remove nitrogen and the cause of the sulfurous smell. They were most excited to share their favorite memories and describe for the parents the feeling of being on island time. It was described as peaceful, tranquil and a true chance to live in the moment.

2b. **In what ways did those activities expand a student's knowledge of the PA portion** of the Chesapeake Bay watershed and its rivers and streams?

It was a revelation to some students to realize just how many of our actions can impact numerous watersheds.

2c. **How were the classroom activities integrated into the school's curriculum?**

Londonderry School is committed to providing students with hands-on experiences to explore the natural environment. Science and environmental studies are integrated across class disciplines. Londonderry School strives to make students aware that they are an integral part of numerous ecosystems.

3. Was the project led by knowledgeable teachers, educators, and/or organizations familiar with providing meaningful Chesapeake Bay watershed experiences? Please describe:

The Karen Noonan Center is owned and operated by the Chesapeake Bay Foundation (CBF). It is an environmental center situated on 20 acres of marsh in southern Dorchester County, Maryland. Upon arrival to the Karen Noonan Center CBF staff greeted us. It is evident from the moment you exit your car that the program is well thought out. We were instructed where to place our things and then given a meeting point to begin discussion about the facility, safety rules, and overall guidelines for the trip. The staff at the center consisted of two counselors, both with training in environmental education. They presented themselves as very knowledgeable individuals who had a true love of the Bay.

4. Did the project involve the community or other partners that expand the influence of the project? If



yes, please explain.

No

5. In what ways might it be possible to measure long-term outcomes of the project?

Londonderry students return frequently to visit after graduation. I spoke with several former students in preparation for this trip. I was impressed with what they retained, but mostly with their attitude toward conservation and the special memories created by this trip. I would like to continue to have informal conversations to follow up on the trip.

The seventh graders are interested in learning more about the Susquehanna next school year. We are going to have some field studies on "the mother river".

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**Project Title:** MWEE101106 Streamside Eco Days

**Funding:** \$1,288

**Conservation District:** Franklin

**School District:** Chambersburg

**School:** Chambersburg Area Middle School

**Summary:** Streamside Eco Days is a hands-on field day for middle school students (grades 6-8) exposing them to subjects such as recycling, wildlife habitat, wetlands management, water quality, tree identification, and macro invertebrates identification. Students are divided into 5 groups and rotate from station to station learning about the aforementioned subjects. Students study these subjects in the classroom prior to the field day and then are given a written assessment on what they learned several days after their field day.

**Students:**

How many students in which grades were targeted through this project?

125 7th grade students were targeted for this activity from the Chambersburg Area Middle School; 125+ 6<sup>th</sup>/7<sup>th</sup>, and 8th grade students were targeted for this activity from the Fannett-Metal Middle School.

What percentage of each grade's total student body do these numbers represent?

This is about 20% of the 7<sup>th</sup> grade at Chambersburg Area Middle School and 100% of the 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grade students at Fannett-Metal Middle School.

**Project Overview:**

1. In what ways did the project include hands-on watershed activities that strengthen a student's connection with the PA portion of the Bay, their local rivers and streams, and instill a stewardship ethic?

The use of the water testing station had the students actually measuring the water quality and then discussing how that could impact a larger area. At the wetlands station, the students talked about and studied the impact of wetlands as runoff preventers and "sponges" that help to protect the watershed areas. During the Forestry area, the students discussed the power of trees to help keep stream temperatures down, in an effort to slow algal growth. And, at the recycling station, they discussed how recycling keeps things out of landfills, which also helps to reduce groundwater and



surface water contaminations. At yet another station, the students also studied the impact of water health on "biological indicators" through the use of macroinvertebrates. At the Wildlife Habitat Station, students learned about habitats of different species and human impact on wildlife survival.

2. a. Please describe the project's pre and post classroom activities/evaluations:  
Pre-trip, the students have been studying Ecology in the classroom, and studying the impacts of humans and animals on an area. They have simulated runoff issues and have discussed the values of biotic and abiotic factors to an ecosystem.

- b. In what ways did those activities expand a student's knowledge of the PA portion of the Chesapeake Bay watershed and its rivers and streams? Post trip, the students will be finishing up their study and discussion of wetlands and will also be watching and discussing the video, "Poisoned Waters" that was put out by PBS in 2009 about the Chesapeake Bay.

- c. How were the classroom activities integrated in to the school's curriculum?

Classroom activities centered around the school's cUITiculu11I focus for those grades which is life science and ecology. The students found the day to be a summation of the material they had been learning all year, from cells to plants, invertebrates to vertebrates, and the impact on a food web.

Was the project led by knowledgeable teachers, educators, and/or organizations familiar with providing meaningful Chesapeake Bay watershed experiences? Please describe:

3. Did the project involve the community or other partners that expand the influence of the project? If yes, please explain.

The program was led by knowledgeable people in their fields, including Jack Sipe from Gettysburg College's Advancing Science Program, working with a NOAA grant for teaching students about the Chesapeake Bay. Jack was present to have the students complete a hands-on macroinvertebrate identification lab, and then based on the organisms that were found, the students were able to identify the health of this stream and any potential negative impact it may have on the Chesapeake Bay. The rest of the presenters were brought in by the Franklin County Conservation District and included a wetlands biologist from the Army Corp of Engineers, a DCNR forestry expert, a botanist who discussed riparian zones and their impact on runoff, and staff from the Franklin County Conservation District and the USDA Natural Resources Conservation Service who led the students in a hands-on water quality test and then later in the day discussed the findings about the health of the stream with the students.

This project included Gettysburg College's mobile Science program in the trip for the CAMS students as a way to allow the students to access to computers, digital microscopes, macroinvertebrate identification and water health issues.

4. In what ways might it be possible to measure long-term outcomes of the project?

Measuring the long-term outcomes of this trip, teachers can use data from previous trips to explain how much they liked the trip and that they have tried to implement some changes at home. Also, teachers can try and touch base with students from previous years to see what they are still doing to help the Chesapeake Bay.

5. The following are questions/answers that will be covered during the Eco Days held for Chambersburg



Area Middle School and Fannett-Metal Middle School as an assessment that can be given to students in the classroom following their field day.

What wildlife species benefits from grassland habitat? bobolink, meadowlark, Northern harrier or marsh hawk and a variety of birds

What are good things to do to manage grassland for wildlife habitat? delay mowing until late summer or only mow every 3rd year; conduct a prescribed burn; disk and let wildflowers grow

Why is managing grassland habitat important? biodiversity

What three things do we examine in the field to determine if we have a wetland? hydrology, soils, vegetation

What are the three types of wetlands? bogs, swamps, marshes

How do we live differently today than your grandparents? cell phones, bottled water, etc.

How much trash is we making today compared to 1960?  
4 pounds to 1 pound

How does American society compare to the rest of the industrialized world?  
plastic bags, yard sales, and preservation techniques other countries use

How can you put into use the three "R's"? a variety of answers

Name three macro invertebrates: mayflies, stoneflies, earthworms, caddisflies, scuds, planaria, sowbugs

List two types of water pollutants: manure, fertilizer, motor oil, antifreeze, pesticides, sediment

Name one method of collecting macro invertebrates: D-net, kick net, rocks

Can macro invertebrates be utilized to examine water quality? Yes

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**Project Title:** MWEEIO1107 My Journey, My Experience, OUR Watershed

**Funding:** \$2,040

**Conservation District:** Franklin

**School District:** Chambersburg

**School:** Chambersburg Area Middle School

**Summary:** Small groups of 20 students traveled to Laurel Lake and participated in the Susquehanna Watershed Education Program instructed by the Chesapeake Bay Foundation experienced guides. The students canoed and experienced the following activities: macroinvertebrate surveys, investigated biodiversity, conducted water chemistry experiments, played environmental themed games such as Eco Lunch Relay race (using the "trash" from their lunches students discover what is reusable, recyclable and landfill) and Super Hero (discovering the importance of planting a buffer zone).

In the classroom, students rotated through the following themed activities: Wetlands, Water cycle and water conservation, Biodiversity and the Chesapeake Bay Health Index, Pollution, and Watersheds. We



utilized a number of activities to achieve the goals. Students experienced team building activities, used technology, completed narrative writing activities, gathered data and created data displays, and worked on hands on experiments.

The only roadblock to this extensive project is the funding. Because we need 6 days to complete the canoe trips, the costs are very high. If we did not receive the funding, we probably could not complete the meaningful watershed field trip experience.

**Students:**

How many students in which grades were targeted through this project?

120- 6th graders

What percentage of each grade's total student body do these numbers represent?

20%

**Project Overview:**

1. In what ways did the project include hands-on watershed activities that strengthen a student's connection with the PA portion of the Bay, their local rivers and streams, and instill a stewardship ethic?

Students conducted a macroinvertebrate survey of Mountain Creek and water chemistry of Laurel Lake/Cumberland County. Results of these surveys were reported to the PA Fish and Boat Commission by the Chesapeake Bay Foundation. Students stenciled drains on Chambersburg Area Middle School's campus and placed storm drain markers within a block of the school property. Students evaluated the impact of their school campus on local water quality using the Chesapeake Bay Foundation's Schoolyard Report card. Students made predictions and a hypothesis of the condition of their campus and water quality of Laurel Lake based on observations made before they completed the scientific research.

2. a. Please describe the project's pre and post classroom activities/evaluations:

A pretest and posttest has been developed and the posttest is part of the students' science grade. A Chesapeake Bay Foundation video is shown to the students prior to the trip. After the 6 day unit, students are also asked to write a post card to themselves describing what they have learned. These post cards will be mailed to students during the summer to remind them of their watershed experience. The students are shown the video, Fern Gully, The Last Rainforest, and asked to write a response essay.

- b. In what ways did those activities expand a student's knowledge of the PA portion of the Chesapeake Bay watershed and its rivers and streams?

Utilizing the Department of Environmental Protection's website-Watershed Notebooks, the students learned exactly where their community is located in the Chesapeake Bay watershed and learn what other smaller watersheds they have an impact on. The students learned about the two major local streams and their locations in the community. The students evaluated their schoolyard and determined what impact it has on the local watershed. A small group of students also re-stenciled the



drains on the school's campus and placed storm drain markers within a block of the school.

c. How were the classroom activities integrated into the school's curriculum?

All activities are standards based and are connected to our Science, Social Studies, Math, and Language Arts curriculums. Projects were designed to correlate with the curriculum. The major subject material was part of our science curriculum.

3. Was the project led by knowledgeable teachers, educators, and/or organizations familiar with providing meaningful Chesapeake Bay watershed experiences? Please describe:

The meaningful watershed experience (Susquehanna Watershed Education Program) was led by guides from the Chesapeake Bay Foundation. Two teachers on the team have taken classes with the Chesapeake Bay Foundation and one teacher has taken a class with the Department of Conservation of Natural Resources. One of our substitutes is a member of the local United States Coast Guard Auxiliary and has extensive knowledge about the material.

4. Did the project involve the community or other partners that expand the influence of the project? If yes, please explain.

The project was covered by the local newspaper, Public Opinion, therefore informing the community of our project and its funding source. Chesapeake Bay Foundation-experienced guides, materials and classes for teachers Franklin County Conservation District-materials and video Pennsylvania Fish and Boat Commission-materials Department of Environmental Protection-materials and website United States Coast Guard Auxiliary-materials and video.

5. In what ways might it be possible to measure long-term outcomes of the project?

Our team has been involved with this project for 12 years. It might be possible to survey students, who were members of our team, on what value the meaningful watershed experience had on their view of the environment. Past students do remark that this field trip was the best they had ever experienced.

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**Project Title:** MWEE101109 Outdoor Education Program

**Funding:** \$5,800

**Conservation District:** Snyder

**School District:** Selinsgrove Area **School:** Selinsgrove Area Intermediate

**Summary:** The Outdoor Education Program at Selinsgrove area Intermediate School experience is a four day trip for fifth grade students in the Selinsgrove Area Schools District where the students are housed in cabins at Camp Nawakwa and are exposed to a variety of outdoor and environmental activities. In particular consideration to a watershed experience, the students take part in an interactive, hands-on class called Stream Study. Mrs. Stacy Gasteiger taught this station and utilized Mr. Dick Hackenberger as a consultant in preparation. **During this class, students are taught the characteristics of a "healthy" stream and the impact humans have on aquatic environments. The students also learn how the "health" of one stream can affect others in their watershed. The students also collect and identify macroinvertebrates, fish, reptiles, and amphibians from our target stream. They learn how gathering data on the populations of these various species can give scientists indicators about the "health" of a stream.**



**Students:**

How many students in which grades were targeted through this project?

178

**What percentage of each grade’s total student body do these numbers represent?**

One hundred percent of fifth grade students from Selinsgrove Area Intermediate School were invited to participate in the Outdoor Education Program, and 96% actually attended the activity.

**Project Overview:**

- 1. In what ways did the project include hands-on watershed activities that strengthen a student’s connection with the PA portion of the Bay, their local rivers and streams, and instill a stewardship ethic?

While at Camp Nawakwa, the students visit a stream on the camp grounds. They study the characteristics of the stream such as flow rate and temperature. They learn what these characteristics mean for organisms such as trout. They also collect organisms from the stream and learn what scientists can discover about a stream based on the populations that live in it. They also learn how this stream affects the bodies of water that connect with it. The students learn how **human activity can affect the “health” of a particular stream and how those changes affect the organisms living in that stream and the bodies of water that connect with it.**

- 2a. Please **describe the project’s pre and post classroom activities/evaluations:**

Before leaving for Outdoor Education, students were given a pretest. Their average score was 61%. Upon returning, students scored 88% on the same test. A copy of the pre and post test is included.

- b. **In what ways did those activities expand a student’s knowledge of the PA portion of the Chesapeake Bay watershed and its rivers and streams?**

Our students have a natural interest in the streams and creeks in the Selinsgrove Area. They are also very fascinated by the Susquehanna River since many students spend time camping, fishing, canoeing, and kayaking this amazing river during the spring and summer months. Students had a deeper appreciation of the river and the way they could impact these creeks, streams, and rivers in the future. They took ownership of what could happen in the future.

- c. **How were the classroom activities integrated into the school’s curriculum?**

In the classroom, 5<sup>th</sup> grade students in our district complete a unit titled **“Interactions of Living Things”**. In this unit they learn how all organisms live in ecosystems where they depend on each other and the natural resources of the environment. The students learn that ecosystems change constantly, with some experiencing rapid modifications. They learn that some of these modifications are brought about by natural processes and others are brought about by human activities. All of the lessons in this unit link to the academic standards listed for Environment and Ecology.

- 3. Was the project led by knowledgeable teachers, educators, and/or organizations familiar with providing meaningful Chesapeake Bay watershed experiences? Please describe:

At Outdoor Education, students are led by experts including district teachers and Mrs. Stacy Gasteiger who consulted with Mr. Dick Hackenberger who taught agricultural sciences at East Juniata High School for many years.

- 4. Did the project involve the community or other partners that expand the influence of the project? If



yes, please explain.

The district staff also teaches classes in Outdoor Survival and Recycling. At Outdoor Survival students learn how to use the natural resources of their environment to survive, how we depend on those resources, and how human activity impacts those resources. At Recycling students learn how we can recycle many used items to limit the negative affects human activity can have on their environment. Students apply lessons they learned from Stream Study during these classes and vice-versa.

5. In what ways might it be possible to measure long-term outcomes of the project?

In the case of our district, teachers from 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grades met with 5<sup>th</sup> grade teachers to decide how to best build upon the environmental and ecological lessons and skills learned by our students.

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**Project Title:** MWEE101110 NPS Pollution Exploration & Watershed Protection Program

**Funding:** \$1,169

**Conservation District:** Union

**School District:** Home School

**School:** Union Co. Homeschoolers

**Summary:** This project involved an in class activity where students used an enviroscape model to learn about watersheds, point and nonpoint source pollution and proper management practices. A follow up field trip occurred where students had the chance to look at their surrounding community and 1) determine what influences the creek flowing through the park and 2) ideas for improving the quality of the water in the creek.

One major roadblock was getting the public school students out of the classroom and into the field. I learned that if this project should continue, arrangements will need to be made with school administrators well in advance of the planned activity.

**Students:**

How many students in which grades were targeted through this project?

Mifflinburg High = 60 students grades 10-12

Lewisburg High = 60 students grades 11-12

Union County Homeschoolers = 12 studetns grades 6-12

**What percentage of each grade's total student body do these numbers represent?**

Mifflinburg High = 13%

Lewisburg High = 20%

Union County Homeschoolers = 100%

**Project Overview:**

1. In what ways did the project include hands-on watershed activities that strengthen a student's connection with the PA portion of the Bay, their local rivers and streams, and instill a stewardship ethic?

The field trip was a great educational supplement to the enviroscape. Students had the opportunity to study in a place that was familiar to them and learn things about that environment that they



normally take for granted. The students were amazed how that small creek is impacted by fellow Union County residents only miles away. They definitely left the field trip with a much clearer understanding of how they can help the Bay.

2. a. **Please describe the project's pre and post classroom activities/evaluations:**

An evaluation was given before this lesson was started. Out of the 132 students taking the pre evaluation, only two scored a 100%. 8 Students had a score of 0%. The average score on the pre evaluation was a 51%. The same evaluation was given after the lesson was complete and 22 students scored a 100%. **There were no 0's and the average rose to 73%.**

b. **In what ways did those activities expand a student's knowledge of the PA portion of the Chesapeake Bay watershed and its rivers and streams?** The students had the opportunity to see how all our streams are tied together and drain into the Susquehanna River. Many students made the comment that they never really gave it much thought as to where the water drains, they just know it goes "somewhere". **They know can appreciate all that Union County has to offer** and in turn by protecting Union County waters, they know that they are protecting the Susquehanna River and Chesapeake Bay.

c. **How were the classroom activities integrated into the school's curriculum?**

The classroom activities were used to fulfill requirements of the environment and ecology standards.

Standards 4.1.10.B

4.0.10E

4.3.7.A

4.3.7.B

3. Was the project led by knowledgeable teachers, educators, and/or organizations familiar with providing meaningful Chesapeake Bay watershed experiences? Please describe:

I believe that the teachers all had a fairly strong understanding of the Chesapeake Bay watershed experiences and the Conservation District was there to help out where needed.

4. Did the project involve the community or other partners that expand the influence of the project? If yes, please explain.

No, the field trip was held at a local park but no officials were present.

5. In what ways might it be possible to measure long-term outcomes of the project?

I think the visual effects of projects like this will speak for themselves. We are finding that the younger generations are more likely to protect wetlands, plant buffers, recycle, etc.



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## Projects Still in Progress:

**Title:** MWEE101101 Raising Conservation Conscious Citizens by Restoring Riparian Buffers

**Funding:** \$2,705

**Conservation District:** Blair County

**School District:** Altoona

**School:** McAuliffe Heights

**Summary:** Students will install 2 riparian buffers along their community FEMA Flood Buy Out sites; both are along Mill Run, an urban stream where floods and pollution are local water issues. Students will research the problem as part of their classroom curriculum before the field day, using a variety of experiential learning techniques.

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**Title:** MWEE101102 PA Chesapeake Watershed Youth WIPs

**Funding:** \$4,824

**Conservation District:** Bradford

**School District:** Canton

**School:** Canton Area High School

**Summary:** A group of student representatives from the seven high schools in the County, will work with the Conservation District and its Partners to Develop a County specific watershed implementation plan (WIP) that is targeting youth (fellow students). The final product will be presented to Agency administrators and legislators in a meeting in Harrisburg.

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**Title:** MWEE101111 Nature Trail and Outdoor Classroom

**Funding:** \$4,825

**Conservation District:** York

**School District:** Red Lion

**School:** Red Lion Area Senior High School

**Summary:** This project includes a 1,060 linear foot nature trail and a 30' x 30' post and beam style outdoor classroom on the grounds of Red Lion Area Senior High School, which lies at the headwaters of Barshinger Creek. The trail and classroom will provide students with an interactive tour of the watershed and the surrounding environment as well as opportunities to study, restore, and maintain the quality of the Barshinger Creek watershed. Students will also be able to analyze and assess this watershed's impact on the Cordonus Creek watershed and then the Susquehanna River watershed.

