

Analyzing and Educating about the Effect of Water Pollution on the Human Population and Environment in Greene County, Tennessee

Working with Middle Nolichucky Watershed
Alliance and AmeriCorps NCCC

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SUMMARY OF THIS ESSAY

This essay focuses on the author's work with the Middle Nolichucky Watershed Alliance (MNSWA) and the AmeriCorps NCCC team during the spring 2012 semester at East Tennessee State University (ETSU). This essay examines the basic vocabulary related to watersheds, looks at the history of laws related to watershed alliances, takes a close look at MNSWA's programs, governing bodies, and employees, and examines the AmeriCorps NCCC program.

ABOUT THE AUTHOR

Micah McFaddin is a senior at ETSU. He will graduate with a Bachelors of Science in May of 2012, with a major in chemistry and a minor in environmental studies. At the completion time of this final draft, Micah has served about 26 hours of volunteer service with the Middle Nolichucky Watershed Alliance and AmeriCorps as part of a capstone course for the East Tennessee State University environmental studies minor. He is interested in the effect of synthetic chemicals on humans and the environment, especially the rivers and waterways.

TERMS RELATED TO WATERSHEDS

First, I will define some important terms.

1. A *watershed* is the land that collects water that runs to a single collection pool, such as a river or lake. The US Environmental Protection Agency defines a watershed as "the area of land where all of the water that is under it or drains off of it goes into the same place. Watersheds are affected by runoff.
2. The *Middle Nolichucky Watershed* is a Valley and Ridge Appalachian Province watershed that completely encompasses Greene County, TN, an area of 624 square miles.

The total area is 0.39% water. According to the 2010 U.S. Census, the population of Greene County was 68,831 (“Greene County”).

3. *Runoff* is water from rain or melted snow that moves across the land. When this water moves across land, it takes loose particles of soil and pollutants.
4. A *riparian zone* is a strip of vegetation, including trees, shrubs, and grasses, that grows along our creeks, rivers and lakes. The strip slows down erosion, reduces sedimentation in water, reduces pollutants carried in by rain runoff, and cools the water, which makes a higher quality environment for a larger variety of fish and other aquatic organisms. The roots and vegetation also stabilize waterways by preventing erosion that undercuts the banks.
5. Source pollution
 - a. *Point source pollution* is pollution that comes from a single source, such as a factory or wastewater treatment plant. The Clean Water Act, a federal law governing water pollution, places restrictions on most point source polluters. These restrictions tell polluters how much and what kind of pollutants can be deposited into the rivers and lakes.
 - b. *Non-point source pollution* does not have one specific source but comes from multiple sources, such as nitrates from fertilizers placed in yards and oil leaks from cars.
6. *Agriculture* is the science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products (“Agriculture”).

***WELCOME TO THE MIDDLE NOLICHUCKY WATERSHED
ALLIANCE (MNSA)***

The mission statement of MNSA is to,

Educate and involve the community through establishing public-private partnerships to develop and implement action plans to preserve, protect, and improve the watersheds within the middle Nolichucky River watershed (*Middle*).

MNSA is a 501(c) 3 nonprofit organization, which means donors can make tax-deductable contributions to MNSA. A board of directors, which meets monthly to discuss budget issues, major decisions, and other situations, governs MNSA. MNSA has existed since 2002. The main office is located in downtown Greeneville, TN.

Excluding the board of directors, MNSA consists of two employees: Paul Hayden and Will Nissley.

1. Paul Hayden, the executive director of MNSA, directs the organization's daily activities.
2. Will Nissley, the Watershed Development Coordinator and AmeriCorps representative, assists Paul with daily tasks, coordinates volunteers to help with various projects, and educates the community about issues related to MNSA's goals.

WATER QUALITY AWARENESS HISTORY

One of the first major U.S. laws to address water pollution was the Federal Water Pollution Control Act (FWPCA) of 1948, which authorized the Surgeon General of the Public Health Service to create programs for eliminating or diminishing the pollution of interstate waters and improving the sanitary condition of surface and underground waters ("Federal"). Due to rising public awareness and concern for water pollution, the law was amended in 1972 and 1977. In

1972, the Clean Water Act (CWA) amended the FWPCA. The CWA established goals for eliminating releases of high amounts of toxic chemicals into the water (“Clean Water Act”). These goals said that surface waters would meet standards necessary for human sports and recreation by 1983, and eliminating further point source pollution of water by 1985. While Richard M. Nixon proposed several environmental proposals to Congress, including a proposal for a Clean Air Act of 1970, he vetoed the Clean Water Act of 1972 because Congress had boosted its cost to \$18 billion. Congress overrode his veto powers (“American Experience”).

The 1977 amendments made illegal point source pollutant discharge into surface waters without a permit from the National Pollutant Discharge Elimination System (NPDES). If a business fails to acquire a permit or violates the permit’s condition, it can be fined up to \$25,000 per day for pollution. If negligent or knowing violations, criminal violations, are committed, individuals can be fined as much as \$50,000 per day and receive up to three years in prison. A “knowing endangerment” violation, one that knowingly place another person in imminent danger of death or serious bodily injury, can result in fines up to \$250,000 and/or 15 years in prison. According to the EPA’s website (“History”), the 1977 amendments also “recognized the need for planning to address the critical problems posed by nonpoint source pollution.”

Nonpoint source pollution is not, however, subject to the CWA permits or other regulatory requirements under federal law. CWA leaves the responsibility of managing runoff to the states under Section 319 of the act. According to the EPA, states issue the majority of permits to dischargers since federal government lacks the resources for day-to-day monitoring and enforcement. However, the EPA’s Nonpoint Source Management Program (NSMP), under the

jurisdiction of Section 319 of the CWA, is designed to help fund watershed alliances through grants. MNWA focuses on nonpoint source pollution and receives grants from the NSMP.

WHAT IS A WATERSHED?

Regardless of where you stand, you are in a watershed. What humans do on the land, such as logging, farming, and using many chemicals, impacts the quality and quantity of water and other natural resources. Healthy watersheds are vital for a healthy environment and economy. Many people may not realize that runoff affects the water for drinking, irrigation and industry. Even though water is treated with chemicals such as chlorine, we are still drinking water from rivers polluted with pesticides, herbicides, feces, dirt, and other pollutants. Many people also enjoy lakes and streams for their beauty and for boating, fishing and swimming. Healthy watersheds are important for food and shelter for wildlife.

PROGRAMS/ACTIVITIES

Middle Nolichucky Watershed Alliance engages the community and makes differences in many ways. MNWA provides education programs, especially at the local schools. Will Nissley, the watershed development coordinator at MNWA, organizes many tree planting and stream cleanup events to engage many students and community members. MNWA has one program called “Clean Streams Team.” The program provides recognition to community members, businesses, construction sites, and schools that pledge to pick up litter and dispose of properly. A window sticker is given to the participant to display, signifying the participant’s community involvement.

MNWA works with locals to make rain barrels, which conserve water and save money. The barrels collect and store rainwater from rooftops. Water can be used to water plants and wash cars and can reduce water pollution by reducing storm water runoff.

MNWA also educates locals about rain gardens, which are strategically placed gardens designed to slow storm water runoff and prevent erosion. Technically, the gardens are beds in shallow basins that treat storm water by capturing the first half-inch to inch of rain and filtering it through various bed components before releasing it into the subsoil.

Will is a representative for AmeriCorps, so he occasionally interacts with groups from AmeriCorps NCCC (National Civilian Community Corps), which is a residential, team-based, national service program that engages young adults ages 18 to 24 in full-time service. The program is part of AmeriCorps, which is funded by the Corporation for National and Community Service, which helps local communities address their needs.

MNWA frequently does stream assessments by measuring certain organisms that represent the health of the stream. Finally, MNWA obtains grants and other resources to address pollution problems in Greeneville and its surrounding areas.

EMPLOYEES OF MNWA

I have interacted with Paul Hayden, the executive director of MNWA, only twice. Paul has a BSEE in electronics (1971) and a B.A. in business management from Liberty University (1988). Paul started MNWA in 2002. Below is a picture of Paul opening MNWA's Enviroscape display, which will be discussed later. According to Will Nissley during a personal interview (Nissley),

Paul is paid by the TVA and other groups. MNWA's board contracts Paul for 10 hours per week, but he actually works between 40 and 50 hours per week.



For the most part, I have interacted with Will Nissley, the watershed development coordinator and AmeriCorps representative for the Appalachia CARES AmeriCorps program, a region-specific team that is tasked with management of Upper East Tennessee.

Will has a B.S. in geology from Radford University (2009). Common among geology majors, Will was close, within three hours, to acquiring a geography minor. He was a substitute teacher at Fairfax County Public Schools from 2009 to 2010. Will likes hiking in the outdoors, hanging out with friends on the weekend, and teaching others. Below is a picture of Will with two teachers after a presentation.



Will is paid mostly by the federal government. His salary is broken down as follows:

- 25% from MNWA, who gets 90% from funding through Section 319 of the CWA, previously discussed
- 25% from Appalachia CARES
- 50% from the Corporation for National and Community Service (CNCS), who was formed by The National and Community Service Trust Act in 1993

Will has been with AmeriCorps for three years. He said that he would love to work with AmeriCorps for the rest of his life, but he is not able to support a family on the small salary. His contract with AmeriCorps expires December 31, 2012. He is currently looking for better paying jobs related to water-quality assessment or work in the public awareness of water quality issues.

GOVERNING BODIES

As previously discussed, MNWA is run by Paul Hayden, the executive director, who is supervised and led by a board of directors. Will Nissley takes day-to-day orders from Paul; however, Will works toward completing objectives for specific grants, such as that from the EPA's Nonpoint Source Management Program and from AmeriCorps' Appalachia CARES program. Annually, Will must reach a group of at least 150 school-aged kids through a water-conservation education event. This event is required by AmeriCorps' Appalachia CARES program, in which Trina Brown, who only "checks in from time to time," supervises Will.

AmeriCorps is a division of the Corporation for National and Community Service (CNCS), a federal agency that hosts five million Americans in service through Senior Corps, AmeriCorps, and Learn and Serve America. The 2010 annual requested budget for CNCS was \$1.1 billion.

Under the AmeriCorps umbrella, there are three main programs: AmeriCorps State and

National, AmeriCorps VISTA (Volunteers in Service to America), and AmeriCorps NCCC (National Civilian Community Corps) (NCCC).

EFFECTS/RESULTS

During my time at MNWA, Will and I have accomplished many things. On February 24, we met with people from TVA, Boone Watershed Alliance, and Buffalo Mountain Camp. With the help of all groups, we will be hosting an AmeriCorps NCCC team during the month of April. The team will be completing trail maintenance, participating in water quality monitoring, planting trees, constructing rain barrels, listening to educational classes on the importance of stream buffers and native plants, and many partaking in other activities. I will be assisting the team with projects and providing support for team needs.

On March 8, Will and I represented MNWA at a science fair at Hal Henard Elementary School in Greeneville, TN. This event fulfilled the Appalachia CARES requirement of reaching 150 school-aged kids or more through a water conservation event. Below is the model that we used.



The model represents a city. We demonstrated to several hundred kids the meaning of a watershed and the importance of taking care of our environment. We used Nesquik chocolate

powder to represent dirt; used orange Kool-Aid powder for household cleaners, motor oil, and others; and used grape Kool-Aid for agricultural runoff, such as fertilizers and manure. We “made it rain” with a water bottle. All the different powders turned into a brown stream, running down the roads, hills, and creeks. The many pollutants ended up in the river, which represented the Nolichucky River, a river that many of the kids watching recognized. We told them that their drinking water came from the river. We told them that even though the water is filtered, we should try to be environmentally conscientious by not littering, by using fertilizers and herbicides sparingly, and by keeping green space (to avoid runoff). We also emphasized the importance of riparian zones, which help to prevent runoff.

On March 16 and 23, I helped Will and a student from Tusculum College plant over 130 trees in Greeneville, which helped to stabilize eroding banks. This project was part of MNWA’s Landowners Incentive Program (LIP). Funded through Section 319 of the CWA, LIP pays for 75% of stream bank restoration and other water-quality improvement activities on a private landowner’s property if the landowner pays the remaining 25%. The following picture is of one of the areas. Notice how the bank drops off near the edge. By planting trees near the edge, the roots stabilize the surrounding soils and grass.



On April 23, Will and I worked with an 11-member AmeriCorps NCCC team to measure the water quality of Greeneville streams. According to Will, the Town of Greeneville contracts MNWA for \$1,500 per year to measure water quality. Below is a picture of team members collecting a one-minute stream sample.



Conclusions

MNWA seems to have a great impact on the region of Greene County, Tennessee. Without the help of nonprofits like MNWA, citizens of Greene County would be less educated about water quality issues, resulting in poorer water quality overall.

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