

EDUCATING MINORITY YOUTH ON WATERSHEDS

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Pollution in rivers is a major problem in majority of the rivers throughout the world. This is a problem that local residents have seen increase in Dog River over a long period of time. In this paper, I educated a minority, African American, youth group on how pollution moves throughout watersheds into creeks and rivers. The group of choice was the youth department at the Emmanuel African Methodist Episcopal Church in Mobile, AL.

In order to do this research I used an enviroscape table donated to me by the Mobile Area Education Foundation. The enviroscape table proved to be suitable for all ages and illustrated what happens on land during a rain event. I assessed the knowledge of the youth with a pre-test, and they participated in exercises with the enviroscape table. In addition, I talked with the group, and gave them a better understanding of watersheds and river pollution. After the exercises are completed, I assessed the knowledge of the students to see if the exercise was successful. The results showed that 66% was the average grade on the pre-test. On the post-test, the average increased 21 % making 87% the new average. In this activity there were three age groups: 7-10, 11-14, and 15-18. The 11-14 year olds were the best group that I observed during the exercise. With being said, hands-on learning is something that should be incorporated in more school systems.

Keywords: enviroscape table, minority education, watershed pollution

Introduction:

Pollution is a problem that Dog River has seen increase over a long period of time. While this may be apparent to individuals in the Dog River Clearwater Revival and other educated individuals in environmental studies, there is still a large amount of the population that is unaware of this. Forsyth et al. (2004), talks about the awareness of pollution in watersheds. In a study done in Turkey, a survey showed that many of the citizens did not know of a pollution problem in Lake Burdur and the surrounding wetlands. It is believed that knowledge about the environment is necessary in keeping our surroundings clean and functional. The lack of awareness in the general public is the

biggest problem that allows environmental issues such as pollution, in this case, to reach horrific levels. Carlisle et al. (2009) research of watersheds disturbances, focused on 770 watersheds in the Western United States and how human developments interrupt watersheds using GIS (Geographic Information System) to map the greatest disturbances. The study showed that the greatest disturbance depended on: housing unit density, road density, pesticide application, dam storage, land cover along a mainstem buffer, and distance to nearest canal or pipeline. The fact is the information is available to any and everyone who desires it, even our youth. The Center for Watershed Protection provides membership opportunities for those who would like to get involved in helping to protect watersheds throughout the nation. The organization also offers various publications that have valuable information on environmental issues. With information all over the internet, any and everybody, including our youth can access this information. Even though our youth are capable of acquiring this information, it is up to the adults to teach them how to keep the environment safe and beautiful.

Even with all this information, in many areas the general population doesn't even care about this problem. With violence at its peak in some communities, the last thing on most citizens' minds is water pollution. The wisdom of youth in our society is often overlooked in the messages they are able to get across to the public. In Driscoll et al. (2004), the youth were made aware of the risk of tobacco, and were heavily involved in a fight against that issue. This power can be used for good by targeting the youth and educating them about watersheds and how to keep them healthy. Most kids and teenagers are very attentive in the religious part of their life; very much so in the African American based church. By getting the youth in churches educated on this problem, this will bring the

church body into this awareness. This will get churches on the side of Dog River Clearwater Revival, and this will also educate minority youth, which are being left out. Kao and Tienda (1998) found that minorities are more likely to lose interest in education before the eighth grade. In addition, Losen et al. (2004) also has a great article on this issue in our society which talks about high drop out rates in African American communities.

This issue must be met head on with interesting education that will enhance the student interest in learning. The Pemaquid Watershed Association in Maine provides various events that help raise awareness in the environment, especially watersheds, clean. In addition, the association offers summer programs, Watersheds Kids Summer Camp, in order to enhance the knowledge of the youth on watersheds and the environment. By making the information fun, students are more likely to retain the information presented. Since African American churches generally have great impacts on their surrounding communities, this will enhance the efforts of getting the words out that “**Pollution is a problem in Dog River.**” Before this can truly be successful we must find the best age groups to target where the information presented will be absorbed the best. Since a vast amount of the population of the Dog River Watershed is African American, I feel it is my duty as an African American male to take the first step in educating the youth of the African American community with help of the Mobile Area Education Foundation and Dog River Clearwater Revival. My group of interest is the youth department of the Emmanuel AME Church (Figure 1). The focal point of my research is a Non-Point Source Pollution Enviroscape table donated to me by the Mobile Area Education Foundation. The enviroscape table is being put into the curriculum in the Lake County

School System in Ohio for 4th-12th grader according to the Classroom Program portion of the school systems website. In addition, one of the counter partners of the non-point source table, the Landfill Enviroscape in being used in Georgia's education for 6th-12th graders, Environmental Education in Georgia.

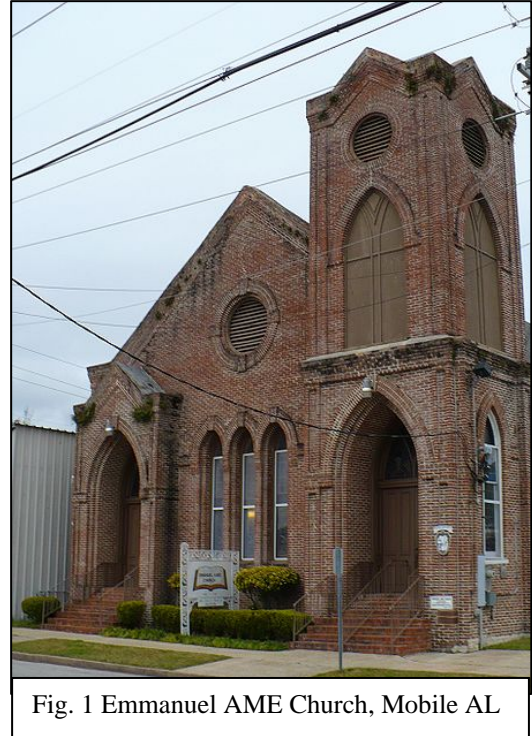


Fig. 1 Emmanuel AME Church, Mobile AL

Research Question:

Which age groups will show the greatest improvement? Will the condensed version of the module be effective? The Mobile Area Education Foundation uses six days to present the module. During the six days different approaches are taken to see how water flows down hill. The foundation uses the Non-Point Source Pollution Model, power-point presentations, and mathematical procedures during the six day period. For example, on the third and fourth day the students calculate to velocity of water flow using different slopes. The foundation also works specifically with middle school children. I planned to show that educating ages 7-18 year olds in just one day will prove very beneficial to the goals and success of the mission to decrease pollution going into watersheds all around us.

Methods:

To begin with, each participant selected a random number out of a cup after signing a consent form (Appendix 1) along with one of their parents. The numbers were

used as way to keep the identity of each student a secret, but at the same time be able to assess each student from pre-test to post test. After which the YPDers (Young People Department) at Emmanuel AME Church were given a pre-test (Appendix 1) of nine multiple choice and true/false questions on pollution and watersheds. After the pre-test was completed by the group, I discussed what a watershed was with them. In addition several examples of components of a watershed were demonstrated to the students. The first discussion was about how flood water picks up pollutants mainly in impermeable parking lots. I then demonstrated an example of a permeable land area with a sponge to show how actual land absorbs rainfall. Next, an example of an impermeable area was shown to the student by using a flat plastic piece of bottle. With these two examples the students were able to see how easy pollutants were picked up due to flooding on impermeable surfaces.

After the discussion with the students, the students then actively participated in a hands-on watershed model. The model use was a Non-Point Source Watershed Enviroscape (Figure 1). The table is one of several enviroscape table productions that are used all over the country and can be purchased at, <http://www.envirosapes.com/>, in order to help enhance knowledge of watersheds.



Fig. 2. Non-Point Source EnviroScape Table, Users Guide, and Accessories

During the hands-on activity, I discussed with the group what non-point sources in a watershed were: residential areas, storm water, transportation, agriculture and construction, and recreational areas and how these places contributed to pollution in watersheds leading to river pollution. With the enviroscape table, the group used different colors of kool-aid to represent different types of pollutants and small pieces to represent litter. After all the pollutants and litter were set in place, each student created a simulated rain event by using a spray bottle filled with water in order to allow the different pollutants and litter to flow across the watershed into creeks and rivers. When the different pollutants entered the creeks and rivers, the students were then able to see how water ways are polluted.

Finally, I held a final discussion with the group on what I had taught them and what they had done themselves. I then opened the floor for any further questions that the students might have had. When this was completed the student then retook the test that

was given at the beginning of the session. After completion of the entire exercise, the students were given refreshments to thank them for participating.

Results:

I found that the average from the pre-test to the post test increased two letter grades. The average on the pre-test was 66% which increased 21% to an 87% on the post-test, shown in the Figure 3. In addition the 11-14 year old group did an impressive job on the pre-test with a passing rate of 87.5% shown in Figure 4. The question that I thought was the most important “When you throw trash out of your car, where does it go?” had the best turn over rate of any question on the test. On the pre-test only 33% of the group successfully answered this question, but on the post-test, the group answered the question with a 100% success rate. The final result observed was that every student passed the post-test.

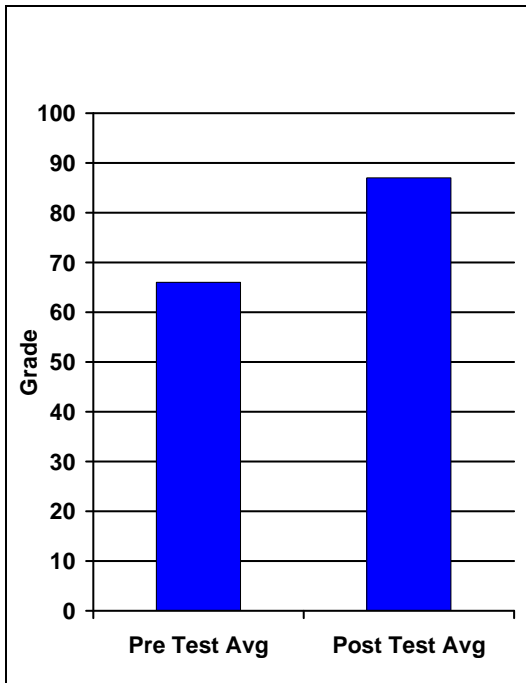


Fig. 3 Test Averages

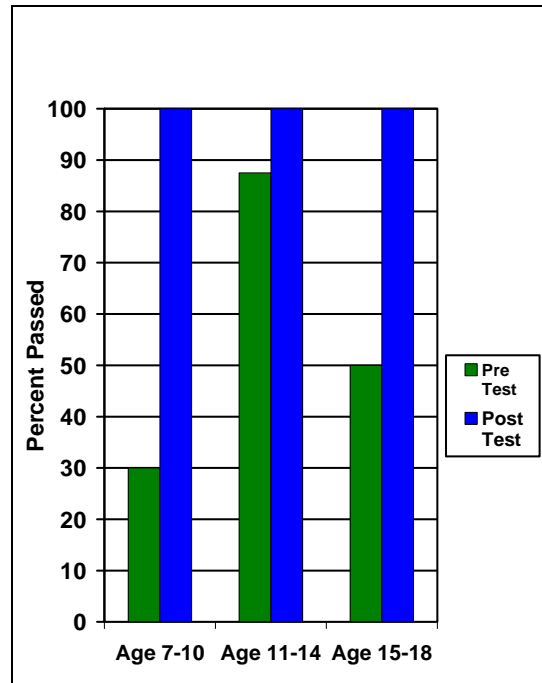


Fig. 4 Results by age group

Conclusion:

Yes, pollution is a problem in the Dog River Watershed. With help of Dog River Clearwater Revival and the Mobile Area Education Foundation, I was able to bring great awareness and knowledge to a group of minority students that have been over looked. Educating our youth is something that has proven to be successful in many cases including in the research of this paper. The condense version of the Non-Point Source Pollution Module proved to be sufficient in providing the adequate education for all youth age groups between 7-18 years of age. The fact that all the students passed the post-test proves the quality of process. The age group that showed the greatest improvement was the 7-10 year old age group. Even though all age groups and each individual student showed a positive turn over rate from pre-test to the post-test, (Appendix 2) the group that I would recommend as the most suitable group to target in getting the point across that pollution is indeed a problem would be the 11-14 year old age group. The reason is because of my observation of the group during the exercise and the fact that only one of them failed the pre-test.

I did not encounter any major problems during the exercise. The students enjoyed being able to actively participate hands-on in a lesson they were learning. I believe that this is one of if not the best way for students of all ages to understand various concepts. If I could change any thing about this exercise, it would be to ask some different question after the pre-test. Also, I will remember to bring more kool-aid next time. Now we have educated the youth on the fact the **“Pollution is a Problem in Rivers.”**

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Appendix 1: IRB Approved Pre- and Post-test and Consent Form

Watershed Function Assessment

Circle only one answer per question

- 1.) What age group are you in?
 - Age 7-10
 - Age 11-14
 - Age 15-18

- 2.) Water flows downhill.
 - A.) True
 - B.) False

- 3.) When you throw trash out of our car, where does it go?
 - A.) The sewage treatment plant
 - B.) The closest river
 - C.) The city dump

- 4.) A watershed is?
 - A.) A land area that drains water to a river
 - B.) A river that dumps into a ocean
 - C.) Land that holds water underground and stores it

- 5.) What can cause pollution in a river?
 - A.) Trash
 - B.) Dirt/Sand
 - C.) Both of these

- 6.) Water in a stream comes from the surface and from groundwater
 - A.) True
 - B.) False

- 7.) If we stop throwing trash on the ground, we could keep pollution out of the rivers.
 - A.) True
 - B.) False

- 8.) Do wetlands protect rivers from pollution?
 - A.) Yes
 - B.) No

- 9.) Have you learned this information at your school?
 - A.) Yes
 - B.) No

Consent Form

Title of project: Educating Minority Youth on Watershed

Name of Principal Investigator: Vincent D. Walker

Contact Information: Cell (334-444-0598) Email: walkerbtone125@aol.com

You are invited to voluntarily participate in a research project

The project is a hands on exercise with assessments on watersheds, rivers, and pollution.

The purpose of the study is to assess the knowledge of watersheds, rivers, and pollution. This will take no longer than 75 minutes to complete. Participation will remain anonymous and no identifying data will be collected.

The students will be given a pre-test, then a hands on exercise will be completed to help understand the material. The hands on exercise will be an enviroscape table that models what happens on the land when it rains. In the hands on exercise the students will review rain events, pollution, and watersheds. With the enviroscape table, the students will sprinkle different colors of kool-aid over the table to represent pollution. To show water happens when it rains the students will use a spray bottle with water inside to create a rain event. This will show how pollution is carried in a watershed into a river. After which, another review session will be completed with the students, and a final assessment will be given to determine what the students have learned.

The benefits that will be gained from this exercise will be a better understanding of pollution.

You can withdraw at any time without consequence. Please contact me at 334-444-0598 or the Institutional Review Board at the University of South Alabama at 251460-6308 if you have questions about your rights as a research subject.

References: 45 CFR 46.117(c) (2)

Youth Participant

Date

Parent / Guardian

Date

Principal Investigator

Date

Appendix 2: Raw Data

Raw Data

Pre Test	
Avg	Post Test Avg
66	87

	Pre Test	Post Test
Age 7-10	30	100
Age 11-14	87.5	100
Age 15-18	50	100

Individual Results	
Pre-test	Post-test
44	77
44	77
66	88
66	77
88	100
88	88
66	88
66	100
66	88
55	66
77	100
44	88