



Student Watershed Watch

A Project of the Toledo Metropolitan Area Council of Governments
April 2014

What is the Student Watershed Watch

The Student Watershed Watch is a project of the Toledo Metropolitan Area Council of Governments (TMACOG). The Student Watershed Watch began in 1989 with Dr. Peter Fraleigh of the University of Toledo. Since 2002, the program has been operated by Matt Horvat, TMACOG's Maumee River coordinator. Up to 800 students in more than 20 classrooms participate each year in three northwest Ohio counties. Approximately 20,000 students have participated in this program since its inception. The long standing nature of the program has made it a tradition and a staple of science education in the greater Toledo region.



How is the program run

The Student Watershed Watch (SWW) is a two-part program involving students from middle school to senior high. First, classroom teachers receive specific training in how to collect environmental data from waterways. Many teachers become certified collectors and can contribute data to university and agency scientific studies. Then teachers take their students out to area streams and rivers and the students collect data. Some information can be compiled on site, other analysis is done in the classroom. Charting and evaluation of results is next. The final step is the Student Summit held about six weeks after field work.

At the summit, classrooms present their findings in table top displays and to the entire assembly as an oral presentation. Students also attend workshops at the summit where they meet with mentors and learn about careers in environmental sciences. The summit provides an excellent opportunity for students to gain valuable experience in public speaking and designing presentations. The opportunity helps students learn how to convey scientific data to a general audience, skills that are transferrable and useful no matter what their future pursuits are.

When does the program take place

The SWW program takes place over a period of about five months. Teacher training can occur any time from spring through summer and fall depending upon availability and the type of training necessary. The students become actively involved in the fall when they return to school after summer break. Although testing and monitoring can and is encouraged to take place throughout the year, we officially have a group-wide testing date in mid-October. Students from all participating schools and classes are encouraged to visit their field site and collect water quality data on a pre-determined date in October. A month later, in November, the students are encouraged to attend and participate in the Student Watershed Watch Summit where they have an opportunity to present their findings and network with their peers and local professionals in the environmental field.

Where do the students come from

The students that participate in the SWW program come predominantly from the central city areas of Toledo. Approximately half of the schools participating are from the Toledo Public School district. The remainder of the schools are from outlying areas in three counties.

Who benefits from the program

The student takes away an experience that may last a lifetime even if they never choose to pursue a career in science. It is not unusual for a middle school or high school student to see her first fish live in a stream during the Student Watershed Watch. Teachers working in the classroom



today find that few of their students spend free time exploring in streams and rivers and many are intimidated by the idea of putting on boots and wading into a river. For many, the opportunity to visit and investigate a stream is simply not available. Kids today aren't typically free to roam and investigate their environment as kids once were. No longer do kids spend hours in the woods constructing a hand built dam on a stream or turning over rocks. Instead, free time is spent on scheduled activities - music, sports, or for many, sitting idle playing video games. The SWW program provides a safe

forum for students to actually get out and get in a stream. Usually, any hesitation on the part of students to get in the water evaporates within minutes on site. Students go from arguing about who HAS to put on the waders to who GETS to put them on.

Field testing takes an hour to 90 minutes and the students usually finish work wet and enthusiastic.

Among many other parameters, students test for:

- Turbidity
- Temperature
- Speed of stream flow
- Dissolved oxygen
- Amount of phosphorus and nitrogen (excess nutrients)
- pH
- *E. coli* and fecal coliform bacteria

These tests are practical demonstrations of math, chemistry, biology, and physics. Students also use a seine to collect benthic macroinvertebrates and various types of larvae. Through their research and exploration they are able to make an objective evaluation of the relative health of their local waterway. Often times, their findings are contrary to their perceptions.

Student presentations at the Student Summit are viewed live, and evaluated by a panel of judges. The judges are comprised of local professionals in the environmental field. They base their evaluations on mastery of material, clear presentation of data, and analysis. Criteria are published on the SWW website so students know what to expect. These are not dry, purely academic presentations. Student presentations have included dramatic readings, PowerPoint, video, and puppet shows.

Why is this program important

The Student Watershed Watch is a program that builds cooperation between school districts and business partners, provides teachers with extra training and resources, and protects water quality by training the next generation of stewards of the environment and citizens

The Student Watershed Watch helps teachers educate their students about water resources, provides practical applications for biology, math, chemistry, and physics, exercise presentation skills, and introduces students to mentors. Teachers participating in the SWW report increased satisfaction with teaching and greater awareness of resources in the community.

Students learn about the water and natural habitat in their own neighborhoods, developing knowledge and respect for natural resources.

Through many years of the program, students are comparing annual results with results collected by their parents' generation. Some teachers have leveraged their work with the SWW into educator-business partnerships, matching a student to an engineering firm in a year-long internship.



Comments from Mrs. Swartz 2013 middle school class:

What did you learn at the Summit?

"I learned about different careers that I could possibly want to explore." - Jonna N.

"Ohio has a very diverse fish population of over 170 species." - Jessica S.



"Ohio has a large diversity of species that many places in the world do not." - Chloe K.

Why was the Summit a good experience?

"I got to see a diversity of people and ideas." - Alyssa F.

"We got to see how hard work pays off." - Alyssa H.

"It showed me how much we needed to protect our freshwater." - Morgan L.

"I learned the importance of protecting the environment." - Keith R.

What would you like to share about participating in the Student Watershed Watch program?

"We were able to actually compare our Q-values and information with other schools across NW Ohio." - Noah H.

"I think the Watershed program is very informative. It made me realize that science is more just a class and that we can make a difference." - Eric F.

"The program was not only educational, but really fun!" - Bailey P.

Elected officials frequently attend the Student Summit, reinforcing the value of natural resources to young people, and encouraging civic involvement. Regulatory agencies benefit from community support of their work and also have a reliable source of data through student and teacher work.

Corporations that donate to the Student Watershed Watch are thanked and recognized throughout the year: on the web page, in press releases and in the TMACOG newsletter, on signage at the summit, and on t-shirts given to participating students. Corporate donors are invited to participate in the Student Summit as speakers or attendees. Some businesses have formed close relationships with specific schools, providing on-going support to students. TMACOG will facilitate any level of corporate participation including providing text and photos for use in newsletters or reports to document corporate involvement.

Why does this program need funding

We understand that schools do their best with the limited resources they have available. A program like SWW may be seen as a frill these days but practical science education is essential for our future. We make the program, resources and supplies free to interested and motivated schools and teachers. The Student Watershed Watch is a priority program for TMACOG but does not have a dedicated funding source. SWW has always been supported by generous donations from local governments, and from business and industry. Still, fundraising is an annual effort and the costs rise as the program expands. More secure, multi-year funding would allow TMACOG to plan more confidently and incorporate more opportunities into the program. The initial influx of funds would allow us to train more teachers and incorporate the new curriculum. The program could be sustained at this level with the reliance on the support of local advocates.



Planning for Growth

Teachers and curriculums change often. Recent changes in the state of Ohio science curriculum have added an entire section relevant to the SWW program. The curriculum for seventh grade students has been completely revised, adding a whole section on environmental

science and water quality. Due to the changes, we expect an influx of seventh grade classes into the program and a need for group training opportunities for new teachers. When a school adds a new class in environmental science, TMACOG shares information about how the SWW can be part of course work. Experienced teachers often want to build on their SWW experience. TMACOG would like to help these teachers acquire certification as Certified Creditable Data Collectors. With certification, the data these teachers collect can be used for studies done by researchers and planners. TMACOG would also like to be able to provide a stipend to speakers who address the Student Summit.

About TMACOG

TMACOG is the Toledo Metropolitan Area Council of Governments, a voluntary organization of dues-paying members. TMACOG members include governmental and non-governmental organizations in northwest Ohio and southeast Michigan: cities, counties, villages and townships, as well as schools and colleges, park districts, businesses, and other groups concerned with quality of life in the region. Members work together on common problems that cross jurisdictional borders, specifically transportation, and air and water issues. TMACOG is a tax exempt organization under section 501(c) (3) of the Internal Revenue Code. Donations to the Student Watershed Watch are tax deductible. See www.tmacog.org for more information about TMACOG.

Teacher Training / Classroom Needs

Typically, teachers new to the Student Watershed Watch learn how to use the collecting materials and how to do analysis through briefings, and pairing with existing, experienced teachers. New teachers are matched with a veteran teacher to learn how to use materials and incorporate lessons. As the program grows due to increased demand because of curriculum changes a more formal group training will efficiently prepare educators. Workshops will provide opportunities for new and existing teachers to gain insight and experience in field work and tie that back into their classroom activities.

All classrooms need basic supplies to begin the program: Hester-Dendy samplers, Secchi discs and other tools, and field manuals and curriculum guides. In addition to the basics, each year classrooms need to use consumable supplies including some chemicals reagents and equipment. Some classrooms that participate in water quality testing are unable to attend the Student Summit due to scheduling or other limitations, however up to 300 students from dozens of classrooms do typically gather. The summit has been held at the Toledo Zoo and at area universities. The location must have room for students to set up table top displays – some requiring power for laptops or aquariums – classrooms for breakout workshops, an auditorium where all students listen to student presentations, and a sufficient space for lunch where students are able to socialize with their peers from other schools and districts.





Maumee River Coordinator: Matt Horvat
Phone: 419.241.9155 Fax: 419.241.9116
horvat@tmacog.org

Toledo Metropolitan Area Council of Governments
(TMACOG)
300 Martin Luther King, Jr. Drive, Suite 300
PO Box 9508
Toledo, OH 43697-9508



www.tmacog.org