**Project Profile**

**Project Title:** Tip of the Mitt Watershed Academy

**Grantee Organization:** Tip of the Mitt Watershed Council (TOMWC)

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**Grant Amount:** $39,950.00

**Time Frame:** March 2, 2015 to January 31, 2107

**Focus:** Stewardship

**Brief Project Summary**

The Watershed Academy engaged and supported students from Northern Michigan high schools in water quality monitoring experiences. Students were provided with tools and knowledge to collect water quality data and assess stream health in the local watershed to foster an attitude of stewardship. Watershed Academy students worked in small groups to become experts and share their findings with classmates, school and community. Data collected at stream sites was entered into a database used to inform and prepare communities to tackle tough management issues such as invasive species management, habitat restoration and water quality in the future.

**Project in Context**

In Northern Michigan, area youth grow up surrounded by fragile, fresh water resources that improve the quality of life for all. Understanding the importance of our water resources is pivotal if we are to sustain our current lifestyle and prepare for future water protection. Many students have limited exposure and understanding of water resources management and ecology. Schools lack the budget to offer enrichment programs, in particular at the high school level. Area environmental education programs are limited in scope with a focus on terrestrial ecosystems and elementary school students. The Watershed Academy provides a unique opportunity for high school students to engage in meaningful research that enhances their understanding of local aquatic ecosystems and empowers them with tools to become effective stewards of their communities and the broader Great Lakes Basin. The academy model allows interested students to focus on water quality and watershed issues outside of the typical classroom, while still supporting the instructional curriculum.

Seeing a need for improved water resources education in our service area (Emmet, Cheboygan, Charlevoix and Antrim counties), the Tip of the Mitt Watershed Council began working with local high schools to develop a unique offering to interested high school biology students. The Watershed Council collaborated during development and implementation with environmental organizations such as Little Traverse Conservancy (LTC), Little Traverse Bay Band of Odawa Indians (LTBB), Northeast Michigan Great Lakes Stewardship Initiative (NEMIGLSI), lake associations and several community resource organizations.

**Project Goals**

The primary goal of the Watershed Academy is to provide the tools, knowledge and training to teams of local high school students to monitor a specific stream bi-annually to help foster a long-term regional stewardship ethic. Students learning about local water resources will help prepare their communities to tackle tough management issues such as invasive species, habitat restoration and water quality in the future. Ultimately, participants will have 1) a greater appreciation through the experience for the water resources surrounding them and 2) understanding that taking action to protect water resources is valuable and important for the future of Great Lakes ecology.

**Results**

* 255 students from 10 Northern Michigan Public High Schools were engaged in stream monitoring to build stewardship ethic. Participants: Year One – *Emmet County*: Harbor Springs, Alanson, Pellston, *Charlevoix County*: Boyne City and East Jordan. Year Two – *Cheboygan* County: Mackinaw City and Onaway, Charlevoix County: Boyne Falls, *Antrim* County: Bellaire and Elk Rapids.
* Watershed Academy participants monitored 9,700’ of stream sites, collected hundreds of macroinvertebrate specimens which resulted in establishment of 10 new MI-Corp stream ratings in the Watershed Council’s Volunteer Stream Monitoring database.
* Students presented stream team projects, including MI-Corp stream score, during four separate gatherings that were attended by teachers, resource persons, and community members supporting their stewardship efforts to the broader community.
* Watershed Academy on-site monitoring provided an opportunity to connect community resource professionals to students to reinforce the importance of stewardship

***Products and Resources***

Tip of the Mitt Watershed Council Website – Watershed Academy page with information on the program. This is currently being updated to increase student and teacher access.

<https://www.watershedcouncil.org/watershed-academy.html>

Video - 5-minute video produced to promote the program  
<https://www.youtube.com/watch?v=FjtpA73sy6s&list=PL-DdC6x-41h8f3B7tRbQlXPu7nYR3rsBm&index=1>

Video - Short video produced to promote the program  
<https://www.youtube.com/watch?v=kQgXXRrN6E4&list=PL-DdC6x-41h8f3B7tRbQlXPu7nYR3rsBm&index=2>

Video - Short video produced to promote the program

<https://www.youtube.com/watch?v=oyAQl718EoM&list=PL-DdC6x-41h8f3B7tRbQlXPu7nYR3rsBm&index=3>

Video - Short video produced to promote the program

<https://www.youtube.com/watch?v=VF0cgNGDMm4&index=4&list=PL-DdC6x-41h8f3B7tRbQlXPu7nYR3rsBm>

Media Coverage Petoskey News-Review article about the program. Pub. 10/12 2015.  
<http://www.petoskeynews.com/featured-pnr/second-watershed-academy-begins/article_b9e83c43-f1df-5251-b408-fc35c1abe4e0.html>

Media Coverage My North article about the program. Pub. 9/24/2015.  
<http://mynorth.com/2015/08/gail-gruenwald-of-tip-of-the-mitt-watershed-council-in-petoskey/>

Media Coverage Petoskey News-Review guest commentary Published 10/18/2016.  
<http://www.petoskeynews.com/news/opinion/guest-commentary-watershed-academy-fostering-millennial-stewards/article_5ddeffe2-8d91-5576-ba65-fbc14e5a5033.html>

Media Coverage Friends of the Boyne River Spring 2015 Newsletter, page 3.

<http://boyneriver.org/wp-content/uploads/Spring-2015-Bulletin.pdf>

Media Coverage Little Traverse Conservancy Summer 2015 Newsletter, page 9.

<https://landtrust.org/wp-content/uploads/2016/03/Summer2015Newsletter.pdf>

**FINAL NARRATIVE REPORT**

**Background/Overview**

The Watershed Academy was a pilot effort of the Tip of the Mitt Watershed Council that operated between April 2015 and January 2017. Through the Watershed Academy, 255 high school biology students from local Northern Michigan schools participated by volunteering for a stewardship experience featuring stream monitoring of a near-by stream. Students were provided with the tools and knowledge to collect water quality data and assess a stream in their local watershed in order to foster an attitude of stewardship. Watershed Academy students worked in small groups to become experts and share their findings with classmates, school and community. Throughout the grant period, data was collected at 10 different sites throughout Emmet, Charlevoix, Antrim, and Cheboygan counties. The data collected was entered into the Tip of the Mitt Watershed Council database where it will be used to inform and prepare the communities to tackle tough management issues such as invasive species management, habitat restoration and water quality in the future. The Watershed Academy has become part of the annual offerings to area students, supported through collaboration with area high schools and community resources.

**Project Outcomes**

**Outcome 1: Watershed Academy Teams established at ten high schools.**

Teams of up to 12 biology students were selected by teachers following a promotional visit to their classroom and completing an application to participate. Promotional visits provided all biology students an opportunity to participate in mini-labs focused on the key components of the experience. The mini-labs included creating a simple watershed model, pH testing, macroinvertebrate ID and exploring point and non-point pollution. Teams were selected prior to each monitoring season, four selection periods in the grant. Spring and fall 2015 established five monitoring teams with an average of 9 students per team. Spring 2016 established four additional teams and fall 2016 established one additional team. Average team size in 2016 was 8 students per team.

**Outcome 2: Students possess thorough knowledge and skills required for stream monitoring and expressed stewardship attitudes through action of stream monitoring.**

Students actively participated in training sessions and applying their knowledge and skill monitoring at sites. Through in-school training sessions, teams gained knowledge about water resources and watershed concepts, water quality monitoring skills, including use of equipment, macroinvertebrate collection methods, and testing chemical properties of the water. Teams also analyzed their team watershed map to identify land use and possible point source and non-point source pollution sources. Students practiced standard water quality monitoring measurements by using a datasheet based on the MI-Corp Stream Monitoring program.

Four to five hour-long training/work sessions per team, in addition to the monitoring day, took place in spring and fall 2015. Five teams participated each season. Training sessions were reduced for spring and fall of 2016 in large part due to teacher and student request. Teachers and students responded through program evaluations that school time missed was difficult to make-up and although after-school and weekend trainings were made available, final changes made offer three hourly sessions or a 3-hour block training session. Additional teams in 2016 made scheduling more difficult as well. Each school selected training options that best fit their scheduling needs.

Students applied their skills and knowledge learned from training sessions in the field at their respective project streams, selected based on criteria used through the Watershed Council’s Volunteer Stream Monitoring program. Students spend approximately a half day in the field collecting water quality data. Five teams from 2015; Harbor Springs, Alanson, Pellston, East Jordan and Boyne City, have stream sites located on or near a nature preserve of the Little Traverse Conservancy (LTC). LTC staff join Watershed Council instructors the second half of the field day, presenting a shared stewardship and land conservation message to Watershed Academy participants, showing how protecting land relates to watershed protection and water quality. Five teams added in 2016; Bellaire, Onaway, Mackinaw City, Boyne Falls and Elk Rapids, utilize the surrounding topography and land use identified in the area to replicate the land and water connection.

During monitoring, teams were supported by visiting resource professionals who shared career path information, help to collect data and shared specific expertise related to the experience. Experts in fisheries, water quality, Native American culture and issues, recreation, river stewardship and land protection attended monitoring days. Each team has at least one resource professional, with many teams enjoying two to three each monitoring season.

Melissa Hansen and Sarah Mayhew, LTC Education Coordinators and Derek Shiels, LTC Easement and Stewardship Specialist participated on LTC nature preserves to share the connection between land and water. Kira Davis (2015), Caroline Keason and Lauren Dey, Little Traverse Bay Band of Odawa Indians (LTBB) Water Quality Specialists participate in select stream monitoring and provide a short presentation to the students about their water resource programs, as well as the traditional and cultural significance of water to the Odawa. Christine Steensma, Educator at Oden State Fish Hatchery, works with the Alanson team that monitors Oden Creek at a highway road/stream crossing before entering Crooked Lake. Team Oden Creek receives a hatchery tour, historical perspectives and the hatchery’s impact on water quality. Teams receive support and expertise from several additional organizations like Walloon Trust and Conservancy, Friends of the Boyne River, Friends of the Jordan River, area chapters of Trout Unlimited, LTC nature preserve monitors, former TOMWC and LTC employees and countless volunteers.

In the development stages of the Watershed Academy, Northeast Michigan Great Lakes Stewardship Initiative **(**NEMIGLSI) staff shared their expertise in facilitating school-community partnerships and creating place-based stewardship education program. The NEMGLISI Annual Regional Networking meeting is a valuable resource for continued development and improvement of the Watershed Academy.

**Outcome 3: Students presented data collected and shared experience with other teams at four public events.**

The Watershed Academy Summits took place during June/November in 2015 and 2016.The summit allowed participating students to showcase their stream monitoring and stewardship projects to one another through displays and presentations. In 2015 all participating teams gathered in the fall and spring at North Central Michigan College. In 2016, the spring summit was unable to be held at North Central Michigan College because of scheduling conflicts. Charlevoix Public Library provided an outstanding venue for teams to present their findings. In fall 2016, 2 gatherings were held in order to minimize travel distance for the schools involved. The north gathering included the teams from schools in Emmet and Cheboygan counties, and was held at the Inland Water Route Historical Museum in Alanson, MI. The south gathering included the teams from schools in Antrim and Charlevoix counties and was held at the Friends of the Jordan River Watershed Center in East Jordan, MI.

Each of the four Summits or Gatherings varied depending on the teachers and participants. Time of the school year, project type selected and team composition played a large role in project success as evaluated by students. Students presented data in a variety of formats ranging from PowerPoint presentations or videos to sharing their data orally. All students and teachers participating stated they felt strongly about gathering all teams to share data and experiences.

**Outcome 4: Watershed Academy student experiences, activities, progress, research and results were promoted to the public.**

The Watershed Academy has been incorporated into the organization website, with postings on Facebook, Twitter and Instagram. Articles and photos were published in the Watershed Council’s newsletter as well. Articles about program collaboration appeared in Little Traverse Conservancy’s newsletter. Petoskey News Review’s online Eco-Bits introduced the Watershed Academy this spring, along with coverage during the Waganakising Bay Day Water Festival in June. AmeriCorps member Eli Baker participated in April in Earth Week Plus in Cheboygan sharing the watershed model along with information about the Watershed Academy to hundreds of attendees.

The success of Watershed Academy members is reported and celebrated through print and social media. Tip of the Mitt Watershed Council works with local news outlets to publicize team projects, stream monitoring and volunteer work via featured articles and online interviews. The Watershed Academy Summit communicates the results of team projects and provides an opportunity for face-to-face interaction with community members, donors and other Academy members. Final projects generated by each team are posted to our website and posters reflecting team stream work is displayed at the Watershed Council office, which is open to the public. Articles about the Watershed Academy are featured regularly in the organization newsletter, *Current Reflections*.

External value for student participation is very important. Community recognition of stewardship efforts by the Watershed Academy participants has been limited. One of the most satisfying aspects of the program is observing students working independently to monitor their streams and then excitedly presenting their projects and data to an interested audience.

**Evaluation Summary**

**Participants.**

The Watershed Academy was a pilot effort of the Tip of the Mitt Watershed Council that operated between April 2015 and January 2017. 259 high school biology students from local Northern Michigan schools participated by volunteering for a stewardship experience featuring stream monitoring of a near-by stream. Students were provided with the tools and knowledge to collect water quality data and assess a stream in their local watershed in order to foster an attitude of stewardship. Watershed Academy students worked in small groups to become experts and share their findings with classmates, school and community.

**Benefits**

Students reported consistently that participation increased their awareness of personal impact of everyday actions in water quality and they developed a greater emotional connection to the environment. Everyday attitudes regarding the importance of water quality and the impact of stewardship action changed for the positive in nearly all students.

Academic knowledge of water quality, watershed concepts and monitoring procedures increased in participating students. Nearly all students stated a willingness to participate in future stewardship actions and behaviors as a result of participation.

Students valued learning new skills outside of the classroom and working with community resource persons. Practicing teamwork skills during training, monitoring at the stream site and presenting results to a broader community was beneficial in increasing students “people skills.” Students showed growth over the course of the program, demonstrating skills in leadership and teamwork.

Watershed Academy program evaluation data indicates students had an overall positive experience (90%), felt prepared for stream monitoring experience (88%) and were supported in by instructors for successful participation (96%). Students reported an increased understanding of land use effect on water quality (91%) and felt team projects were a useful method of sharing data and experiences with other teams and the larger community (75%).

**Stewardship outcomes.**

97% of students responded positively when asked to indicate whether or not they would like to continue their water resources stewardship activities through additional opportunities beyond the Academy. The majority of participants would recommend participation to their younger peers. To date, several Academy alumni have pursued independent stewardship actions, such as volunteer stream monitoring with non-school related teams and volunteer for river clean-ups and educational events. One student participated in an internship with an area lake association by collecting macroinvertebrates in a community river and placed fish habitat structures in a nearby water body.

Watershed Academy teams monitor twice a year which supports stewardship ethic throughout the participating population and the school. Annual team data is displayed in school. This provides continuity and a long term approach, supporting the stewardship ethic.

**Recommendations.**

Based largely on data collected from pre/post assessments the recommendations for improving this aspect of the program are:

* Findings suggest that students may not be fully appreciating the purposes and science behind water sampling; although gains were seen in the percentage of students able to identify the best way to monitor creek health, ideally a greater proportion of participating students would answer this question successfully. Program operators should review the lessons and process through which students are gaining an understanding of water-quality monitoring processes to see if the materials can be strengthened.
* In future programs where pre/post surveys and tests are utilized, the difficulty of the questions should be increased to provide a better opportunity to demonstrate skills and knowledge gained in the program.
* Pre/post tests should be matched, by student, using the name or a code unique to each student, to ensure that the pre-to-post change is a valid measurement of student knowledge growth, and not driven by change in the underlying groups of students taking the test.
* Continue to utilize survey as an engagement tool for biology populations, but revise questions to get more specific answers.

Programing recommendations:

* Teacher engagement is essential to student involvement. In those teams where the teacher was excited and engaged about the program, students were consistently successful and had high value for the program.
* In future programs, identify engaged teachers and support their participation by making the program flexible to school schedule and population.

**Related Efforts**

The Watershed Academy was a stand-alone effort piloted in 2015. Community foundations, private foundations, and private funders have shown strong support for the Watershed Council’s Watershed Academy program. Response to the Watershed Academy continues to be very positive from the students and families, communities, school districts, businesses, environmental organizations and funding partners. The 2016 spring and fall sessions, broadened our geographic participation in a unique way. The Watershed Council now has programs in each county in our service area – Emmet, Charlevoix, Cheboygan and Antrim. This opens up new opportunities securing funding for program sustainability.

The Watershed Council was successful obtaining significant additional funding to support the Watershed Academy. In addition to GLFT funding, the program received funds from the following organizations: Petoskey Harbor Springs Area Community Foundation, Charlevoix County Community Foundation, Oleson Foundation, Frey Foundation, Little Traverse Conservancy, Frey Foundation, AmeriCorps and Tip of the Mitt Watershed Council membership. Additional funding was provided by private donors.

$50,000 in funding was donated by the Ernie Mainland Fund in 2016 to continue the Watershed Academy Program.

Currently, the Watershed Council is working toward finalizing an agreement with LTC and the Petoskey Harbor Springs Area Community to establish a joint agency fund entitled “Land the Water Education Fund” to ensure long term funding for our water education programming. The expectation is that $50,000 is generated annually to support the Watershed Academy and future programs.

In April 2017 the Mitt Watershed Council will receive a grant from the Great Lakes Fisheries Trust to provide Middle School Water Resources Education in the Watershed Council service area (Antrim, Charlevoix, Cheboygan and Emmet Counties). This grant was in part a response to comments from interested middle school teachers who were surveyed regarding water resource education needs in Northern Michigan.

The success of the Watershed Academy program helped to generate interest in the development of a new program, A2A – Awareness To Action, that focuses on water integrated place-learning in a local 5th grade level elementary school.

**Communication/Dissemination**

**Publications**

Student projects from each Watershed Academy Session can be found on the Watershed Academy page on the Tip of the Mitt Watershed Council website.

<https://www.watershedcouncil.org/student-presentations.html>

Projects include: student projects, brochures, posters, and videos.

* Promotional Documents-flyers, brochures,

**Presentations**

* 2015 TOMWC Annual Meeting Presentation - Maria Affhalter, Jennifer Buchannan, and Mackenzie Dix presented the program to the Tip of the Mitt Watershed Council’s membership at the annual meeting in July 2015
* Ohio Water Environment Association Conference Presentation - Maria Affhalter and Elijah Baker traveled to Aurora, Ohio to present at the Ohio Water Environment Association Conference on June 27th, 2016.
* Presented to Local Lake Associations - Maria Affhalter and Elijah Baker presented the program to the Lake Charlevoix Association on June 8th, 2016. Funding for the Watershed Academy teams in the Lake Charlevoix watershed was procured as a result of this meeting.
* Presented to the Petoskey Rotary - Gail Gruenwald, Maria Affhalter and Elijah Baker presented the program to the Petoskey Rotary on January 5th, 2017.

**Websites**

* The Tip of the Mitt Watershed Council created a Watershed Academy page on their website. Information on the program and previous student team projects were posted on the website. The webpage was also used as a forum for the instructors to share resources and information with the students.
* Facebook - <https://www.facebook.com/groups/watershedcouncil/?ref=group_cover>
* Instagram - <https://www.instagram.com/tipofthemittwatershed/>

**Reflections**

Promoting stewardship in youth through stream monitoring is an important to securing community support and raising awareness of local water resources.

Providing flexible scheduling options to teachers is beneficial to recruiting new schools to the program.

Asking that participants take time away from the classroom is difficult with current testing and academic standards.

Area youth are excited to engage in activities that take place in their watershed and learn how to protect it.

Future assessments should be designed to better reflect learning outcomes in order to gather more conclusive data.

**Attachments**

GLFT #1514 WA Financial Report

Letters of Support

Presentations

Program Documents

Publications

WA GLFT Evaluation Report