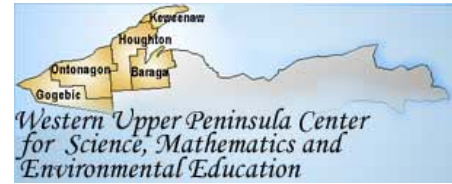


Western Upper Peninsula Center for Science, Mathematics and Environmental Education

2013-2014 Annual Report



The Western Upper Peninsula Center for Science, Mathematics and Environmental Education provides services to 19 school districts and their communities in Baraga, Keweenaw, Houghton, Ontonagon, and Gogebic counties. The Center strives to develop scientifically literate and environmentally committed citizens, scientists, and community leaders for the 21st century by providing innovative and quality programming for students, teachers and the community.

Overview of the Year's Accomplishments

LSSI and Global Watershed

The major goal of this initiative is to prepare K-12 students to become knowledgeable citizens, concerned about the quality of life in their community, and actively engaged in the stewardship of Lake Superior and its watershed. The initiative provided sustained professional learning for teachers, mini-grants to fifteen schools, assistance with stewardship projects, facilitation of school-community collaborations and community events. The Lake Superior Stewardship Initiative (LSSI) is one of nine funded Hubs that comprise the Great Lakes Stewardship Initiative (GLSI). LSSI is funded by the Great Lakes Fishery Trust, Wege Foundation, NOAA Environmental Literacy Grant and Earth Force. For more information, visit lakesuperiorstewardship.org.

Global Watershed program is a collaborative effort of the Western UP Center and Michigan Tech Center for Water and Society and it is funded by a National Science Foundation grant. It provides two-year fellowships for Michigan Tech Ph.D. students to work with LSSI teachers to engage students in research on watershed science topics through lessons and field experiences. This project placed thirteen fellows in science classrooms during the 2013-14 school year. For more information, visit www.globalwatershed.mtu.edu.

Student Events that Highlight STEM Careers

The Western UP Center held many student events that engaged K-12 students in relevant content related to careers in science, technology, engineering and math. Professionals from Michigan Tech, community organizations, businesses and government donated their time as activity facilitators and role models for students during these events. The events were the Water Festival, Science and Engineering Festival, Western UP Science Fair and Festival, Ride the Waves and Job Skills/Technology class. More information about these projects is discussed in the Spotlight on Student Services.

Comprehensive Math Professional Learning Program

Comprehensive sustained professional learning in mathematics was available to districts in the Copper Country and Gogebic-Ontonagon ISD through the Greater Proficiency in Mathematics (grades K-8), Project PRIME (grades 6-12), and Enhancing Mathematics Instruction for Students with Disabilities (grades 6-8). These projects focus on helping teachers implement the Common Core State Standards for mathematics in their classroom and engage all students in meaningful learning. More information about these projects is discussed in the Spotlight on Professional Learning.

Family Science and Engineering

During 2013-14 school year, fourteen Family Engineering and Science Nights were held at elementary schools in Houghton, Baraga, Gogebic and Ontonagon counties for students and their parents. Students and their parents attend two 40-minute inquiry-based activities led by Michigan Tech undergraduate and graduate students. Elementary students solved a problem, did an experiment, tackled an engineering challenge, or conducted an investigation. The program was conducted in collaboration with Michigan Technological University's Departments of Education and Civil & Environmental Engineering.

Organization of the Report

The Strategic Plan identifies six service areas: Leadership, Professional Learning, Student Services, Curriculum Support, Community Involvement, and Resource Clearinghouse. This report will focus on Professional Learning and Student Services for the entire service area. In addition, there will be a narrative on closing the achievement gap describing services to Priority and Focus School(s) in the area, including successes and challenges.

REGION-WIDE PROFESSIONAL LEARNING

Goal: For educators who participate in Center Professional Learning to reflect best instructional practices in their own settings.

Who participated in the professional learning?

Professional learning opportunities were provided for classroom teachers, classroom support staff, administrators, parents/community members, and others involved in K-12 education. The table below describes who participated.

Table 1: Participants Receiving Professional Learning

Participants			Reported Gender**		Position					
			M	F	Admin	Math Tchr	Sci Tchr	Tech Tchr	Comb Subj	Other or Unknown*
Pre-School	1	3	0	1	0	0	0	0	1	0
Elementary	80	2,396.5	5	75	0	2	1	0	68	9
Middle/Jr. High	15	353	8	7	0	8	3	1	1	2
High School	38	880	13	25	0	8	11	0	2	17
K-12 Mixed Levels	29	600.25	9	20	3	2	3	0	5	16
Other*	32	1,203	10	21	0	0	1	0	0	31
Total	195	5,435.75	45	149	3	20	19	1	77	75

*Other includes persons who work across levels, are not teachers or administrators, or did not indicate position.

**Gender was not reported by all individuals.

Professional learning was delivered in many ways, depending upon the identified needs. Two primary formats included: (1) **Single events**, lasting for a portion of one day to several consecutive days, focused on a particular topic, skill, or issue; and (2) **Series**, which were a series of sessions (one building on the previous one and conducted periodically over a several week/month period). The goal was to systematically strengthen teaching practices based on local needs and current research.

Teachers who participated in Western UP Center for Science, Mathematics and Environmental Education activities received, on average, 27.9 hours of professional learning related to mathematics, science, engineering, or other.

Table 2 below details the number of sessions offered for each subject by grade level as well as total hours and total number of participants in the sessions.

Table 2: Professional Learning Activities

		Math	Science	Engineering	Other	Total
Elementary	Events	0	1	1	0	2
	Hours	0	2.5	6	0	8.5
	# Participants	0	4	22	0	26
Elementary & Middle/Jr. High	Events	3	0	0	0	3
	Hours	90	0	0	0	90
	# Participants	69	0	0	0	69
Middle/Jr. High	Events	3	0	1	0	4
	Hours	72	0	6	0	78
	# Participants	45	0	9	0	54
Middle/Jr. High & High School	Events	0	2	1	0	3
	Hours	0	22	9	0	31
	# Participants	0	31	8	0	39
K-12 Mixed Levels	Events	0	10	0	3	13
	Hours	0	146	0	7.25	153.25
	# Participants	0	122	0	38	160
Total	Events	6	13	3	3	25
	Hours	162	170.5	21	7.25	360.75
	# Participants	114	157	39	38	348

Spotlight on Professional Learning

Comprehensive sustained professional learning in mathematics was available to districts in the Copper Country and Gogebic-Ontonagon ISD through the Greater Proficiency in Mathematics (GPM) (grades K-8), Project PRIME (grades 6-12), and Enhancing Mathematics Instruction for Students with Learning Disabilities (grades 6-8). These projects focus on helping teachers implement the Common Core State Standards for mathematics in their classroom and engage their students in meaningful math learning activities. Sixty teachers participated in the professional learning activities for these programs spanning the summer of 2013, the 2013-14 school year and concluding in the summer of 2014.

Greater Proficiency in Mathematics provided elementary and middle school teachers with 84 hours of professional learning focused on building a deeper understanding of concepts in the Common Core State Standards (CCSS), nurturing mathematics leadership in participating districts and using student work to inform instruction. GPM is a partnership between the five Math/Science Centers located in the Upper Peninsula, Lake Superior State University, Northern Michigan University, Michigan Technological University, Bay de Noc Community College, and the Intel® Math Program (Vermont Mathematics Initiative) and the Mathematics Learning Communities program in Massachusetts.

Project PRIME is a statewide project of the Michigan Mathematics and Science Centers Network and the Western UP Center served as a regional site. Project PRIME provided secondary math teachers with 54 hours of professional learning focused on developing skills and knowledge to teach the mathematics in the CCSS and engage students in rich math tasks that require them to apply the mathematical practices in the CCSS.

Enhancing Math Instruction for Students with Learning Disabilities provided 20 hours of professional learning for teams of middle school math and special education teachers focused on strategies for making mathematics more accessible to a range of students, particularly those with learning disabilities.

The Western UP Center will continue to provide high quality professional learning opportunities to math teachers into the 2014-15 school year through the *Engaging Students in the Standards for Mathematical Practice* project. The Western UP Center partnered with Michigan Technological University to receive funding from the Michigan Department of Education Title II Teacher Quality grant to provide 90 hours of professional learning in Common Core State Standards and Mathematical Practices over two years. The focus will be on deepening the understanding of the mathematical practices and how these practices can be implemented in instructional practice to engage students in meaningful relevant mathematics learning experiences.

Student Services

Student services are delivered based on identified needs to improve and enhance science, technology, engineering, and mathematics education. Students who participate in enrichment activities have the opportunity to explore new concepts, develop process skills, cooperate on group tasks, and discuss their findings. Student services include:

- ❖ Family Science and Math Nights
- ❖ Environmental stewardship projects to address needs in local communities
- ❖ Field trips to natural areas to promote environmental stewardship.
- ❖ Western UP Science and Engineering Fair and TiViTz Math tournament
- ❖ STEM career programs
- ❖ Water Festival

Table 3 below details the number of student sessions offered for each subject by grade level as well as total hours and total number of participants in the sessions.

Table 3: Student Services Activities Provided in 2013-2014

		Math	Science	Engineering	Total
Elementary	Events	0	149	1	150
	Hours	0	334	2	336
	# Participants	0	3,344	356	3,700
Elementary & Middle/Jr. High	Events	1	9	0	10
	Hours	5	79	0	84
	# Participants	207	676	0	883
Middle/Jr. High	Events	0	5	0	5
	Hours	0	6	0	6
	# Participants	0	298	0	298
Middle/Jr. High & High School	Events	0	1	0	1
	Hours	0	4	0	4
	# Participants	0	280	0	280
High School	Events	0	6	0	6
	Hours	0	37	0	37
	# Participants	0	473	0	473
K-12 Mixed Levels	Events	0	5	0	5
	Hours	0	54.5	0	54.5
	# Participants	0	682	0	682
Total	Events	1	175	1	177
	Hours	5	514.5	2	521.5
	# Participants	207	5,753	356	6,316

Spotlight on Innovative Student Services

The Western UP Center has two offices, one located at the Copper Country ISD and one located at Michigan Tech Great Lakes Research Center (GLRC). This allows the Western UP Center to build partnerships among K-12 education, university, businesses and community organizations to bring innovative student programs that engage students in STEM learning activities and explore STEM careers. Many student events took place on Michigan Tech's campus giving students access to research facilities there.

Outdoor Science Programs—Throughout the School Year

This program provided students with an opportunity to explore forests, fields, wetlands, and streams where they can apply scientific concepts and gain new skills through a variety of hands-on activities aligned to the Michigan Content Standards. A member of the Western UP Center's staff traveled to a natural area near the school to conduct the field trip. This program is funded by a grant from the Kinship Foundation.

Tremendous Technology Family Night—September 24, 2013

This family event took place at the Portage Lake District Library for K-6 students and their parents. Families had the opportunity to participate in activities about the basics of circuitry and electrical engineering such as: making Play Doh sculpture light up and move; designing a video game controller using bananas; using a paintbrush to make computerized music and designing toys and household objects using a 3D printer.

Water Festival—October 17, 2013

High school students had the opportunity to participate in this day long festival highlighting the Great Lakes research happening at the Michigan Tech. Approximately 1,000 students were introduced to a wide variety of Great Lakes and STEM career fields through engaging activities taught by Michigan Tech scientists.

Science and Engineering Festival—October 22, 2013

Grade 4-6 students had the opportunity to participate in engineering challenges and 25 Mind Trekkers stations. Michigan Tech's Mind Trekkers STEM Shows bring the WOW! of science, technology, engineering, and mathematics to the hands and minds of K-12 students through fun activities conducted by undergrad and graduate students.

Job Skills/Technology Class—Fall 2013

At-risk high school students from Horizons Alternative High School participated in a class focused on how technology is used in a variety of jobs/careers. The goal was to help prepare them to enroll in a community college or university after high school to gain the necessary degrees. The class was taught by Chad Norman, Science & Technology Specialist, Michigan Tech University and Michigan Tech students who served as role models and shared their knowledge of essential technology skills needed to succeed in the work or university life.

Afterschool Classes—Throughout the School Year

Elementary students had the opportunity to participate in science and technology activities at the Great Lakes Research Center. The classes were taught by Michigan Tech students and involved elementary students in rich and relevant learning for a period of six weeks.

Western UP Science Fair and Festival—March 25, 2014

Grades 4-8 students participated in the 15th Annual Western Upper Peninsula Science Fair. Students designed projects on science investigations they conducted and they were reviewed by science professionals from Michigan Tech and the community. Science fair participants and their families had the opportunity to participate in the Science and Engineering Festival, which offered two dozen fun, hands-on activities conducted by Michigan Tech students. Award winning projects were displayed at the Carnegie Museum in Houghton from April 8-19, 2014.

Designing a Mobile App Afterschool Class—March 17-April 17, 2014

High school students had the opportunity to learn the fundamentals of computer programming (Android), graphic design, and the workflow of app development. Students worked in small teams to create a working Android mobile app for a community or school organization.

Ride the Waves—Throughout the School Year

Students and teachers in grades 4-12 had the opportunity to explore Lake Superior and adjacent waters aboard Michigan Tech's research vessel, the *Agassiz*. A member of Michigan Tech's faculty led explorations with expertise on the topic, assisted by undergraduate student mentors. The Ride the Waves Program was funded by GM (General Motors) and Michigan Tech's Great Lakes Research Center and coordinated by Dr. Marty Auer, professor, Department of Civil & Environmental Engineering and Western UP Center staff.

Closing the Achievement Gap

At the beginning of the 2013-14 school year, there were five Focus Schools in the Western UP Center's service area and there were no Priority Schools. The Western UP Center targeted administrators at the Focus Schools to encourage their staff members to participate in the comprehensive sustained professional learning in mathematics that was available through the Greater Proficiency in Mathematics (GPM) (grades K-8), Project PRIME (grades 6-12) and Enhancing Mathematics Instruction for Students with Learning Disabilities (grades 6-8).

The Houghton-Portage Township School district is comprised of three schools and each school is identified as a Focus School. The director of the Western UP Center met with superintendent of this district at the beginning of the school year to develop a plan to build capacity and teacher leadership through professional learning. The superintendent took advantage of the professional learning opportunities provided and supported a majority of the staff of each school to participate. Six elementary teachers, one at each grade level, participated in GPM. One of these teachers participated in additional professional learning to serve as a teacher leader for the GPM program. A middle school team of math and special education teachers from this district participated in Enhancing Mathematics Instruction for Students with Learning Disabilities and 75% of the high school math department participated in Project PRIME.

The impact of teacher participation in GPM on student achievement was assessed through a pre/post instrument that focused on understanding of the key concepts in the Common Core State Standards. The change from pre-to-post results was statistically significant in grades 3-5 and grade 7. This indicated a very positive impact on the participating teachers' instructional practice and their students' achievement.

Spotlight on Partnerships

The Western UP Center is one of the five Michigan Math and Science Centers that comprise the Superior Hub of the Michigan STEM Partnership. With support and funding of the Superior Hub, the Western UP Center was able to conduct three STEM programs that involved teachers and students during the 2013-14 school year.

Engineering is Elementary—August 26, 2013

This workshop helped teachers integrate engineering, technology, and the engineering design process into the teaching of core subject areas: science, math, social studies, and language arts. Engineering is Elementary (EIE) is a new research-based series of 20 curriculum units for grades 1-5 developed by the Boston Museum of Science.

Science and Engineering Festival—October 22, 2013

Grades 4-6 students participated in engineering challenges and 25 Mind Trekkers stations. Michigan Tech's Mind Trekkers STEM Shows bring the WOW! of science, technology, engineering, and mathematics to the hands and minds of K-12 students through fun activities conducted by undergrad and graduate students.

Outdoor Science Field Trip Program—Spring 2014

This program provides students with an opportunity to explore forests, fields, wetlands, and streams where they can apply scientific concepts and gain new skills through a variety of hands-on activities aligned to the Michigan Grade Level Content Expectations. A member of the Western UP Center's staff travels to the school site or a natural area near the school to conduct the field trip.

The ongoing partnerships developed in the Superior Hub will provide innovative STEM programs into the 2014-15 school year for students and teachers in the Western UP Center service area.

Water Festival—October 23, 2014

This project will engage 1,000 grades 4-8 students and teachers in a day-long Water Festival held at MTU's Great Lakes Research Center where faculty, graduate students, high school teams, and community members guide students in learning about Lake Superior and how scientists engage in research. The Festival provides students with the opportunity to interact with real-life Great Lakes research scientists sparking interest in STEM careers and potential educational paths.

Leading Career STEM Tours for High School Students

This project will introduce 300 high students in learning about STEM career opportunities in earth, life, and physical science, as well as, engineering and technology. All day STEM career tours at Michigan Tech University will be conducted for 30 students per school district that will excite students about the many possible careers within their reach. Presenters will include Michigan Tech faculty and graduate students and guest presenters from consulting firms, government agencies, and industry.

Generation of Energy

This program is a collaborative effort between Horizons Alternative High School, New Power Tour, and Efficiency Through Engineering and Construction Program and gives students classroom education and hands-on experience in conducting energy efficiency audits and winterizing homes, providing them with insight into the STEM world and experience they can use to strengthen college and job applications.

Science Olympiad

This project will engage grades 3-6 students from Lake Linden-Hubbell Elementary in a yearlong afterschool Science Olympiad club, held once a week at the school with parent and community involvement. The opportunity to interact with adults employed in the STEM fields will spark interest in potential educational paths and pursuing careers in the STEM areas.

Director's 2013-2014 Budget Discussion

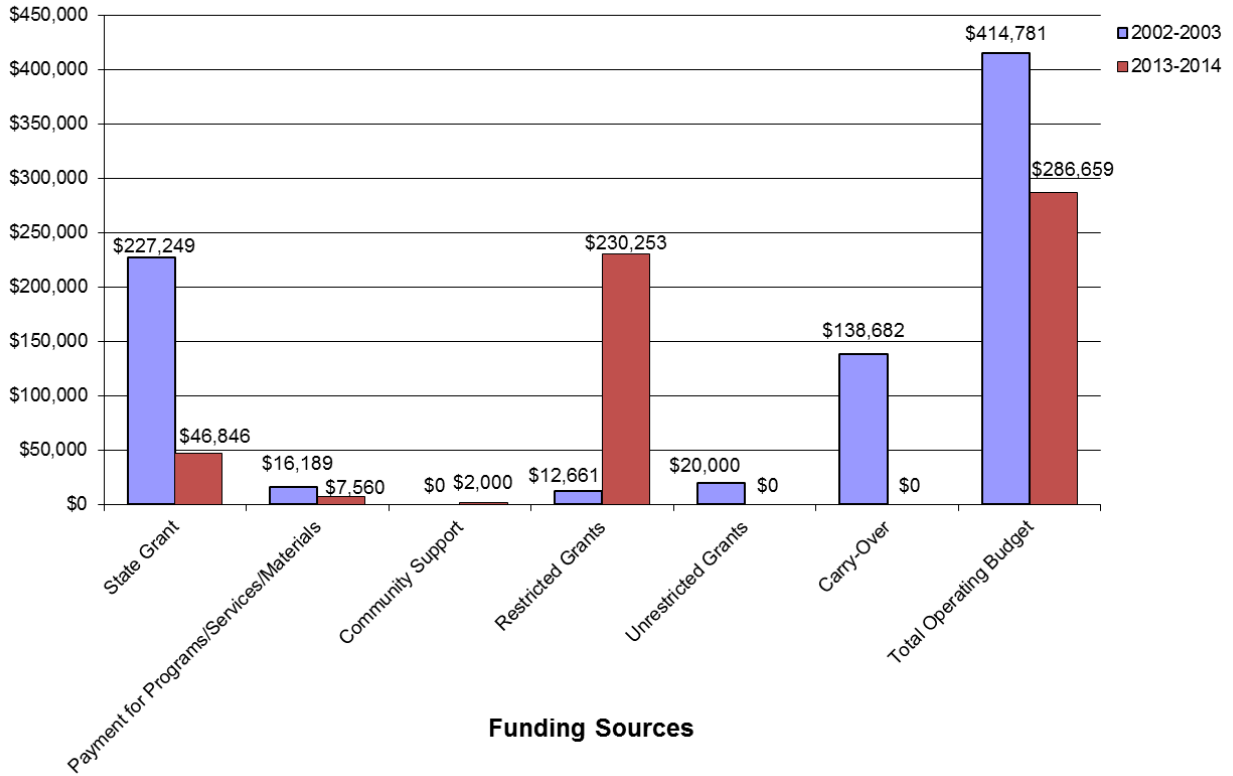
During the 2013-14 school year, the Western UP Center provided a wide variety of student programs and professional learning opportunities by combining funds from Section 99 with eight restricted grants, program fees and community donations. The Section 99 allocation to the Center does not provide enough funding for the salary for one full-time person or to maintain programming. A substantial amount of staff time was spent pursuing grant opportunities and building collaborative partnerships to maintain programming and staff for the 2013-14 school year.

The Western UP Center charged a fee for family science nights, afterschool programs and field trips. These fees paid for materials, travel and a small portion of staff time. A majority of staff time for these programs was covered by grant funds. These programs are valued by the school districts, parents and community; they are willing to pay the fees, even in the atmosphere of reduced school budgets.

Section 99 funding for the 2013-14 school year accounted for 16.4% of the revenue of the Western UP Center. The rest of the Center's operating budget was based on other grant monies, program fees and community donations. Many grants are for one to three year projects and they do not provide sustained support for Center staff. Currently the Western UP Center has four staff members. A majority of staff salaries are covered by grant funds other than Section 99 funds. In addition, Western UP Center staff must take on other responsibilities and duties outside of the Center activities to maintain their salary and benefits.

The Western UP Center budget for the 2014-15 school year will be comprised of Section 99 funds, seven restricted grants and program fees. The operating budget for the 2014-15 school year is approximately 83% of the amount of the operating budget for the 2013-14 school year. Currently, Section 99 funding will contribute 19.8% of the revenue for 2014-15 school year.

Changes in the Western Upper Peninsula Center's Financial Support



In addition to the financial support illustrated in the graph above, “in-kind” services received by the Center (donated time, facilities, or equipment) were valued at \$22,700.

Director's Summary 2013-2014

The Western UP Center for Science, Mathematics and Environmental Education is a partnership of the Copper Country Intermediate School District (CCISD), Gogebic-Ontonagon Intermediate School District (GOISD), and the Center for Science and Environmental Outreach at Michigan Technological University (MTU) and provides services to schools in the CCISD and GOISD. This crucial partnership gives the Western UP Center the ability to provide student and teacher programming to the districts in our service area. It gives the Center flexibility in securing grant funds and resources to implement these programs. The Western UP Center is the main provider of professional learning in math and science for teachers in our service area. Center staff spent a substantial amount of time cultivating partnerships and pursuing grant opportunities to provide programming during the 2013-14 school year and into the 2014-15 school year. The efforts of Center staff resulted in successfully securing grant funds from Michigan Space Grant, National Science Foundation, Michigan Department of Education, Michigan STEM Partnership, Great Lakes Fishery Trust, Mathematics and Science Partnership, National Oceanic Atmospheric Administration, Earth Force, Keweenaw Community Foundation and the Kinship Foundation.

The Western UP Center's professional learning programs continue to focus on providing resources, strategies, and assistance to teachers as they implemented the Common Core State Standards in their classroom and improve their classroom practices. The Western UP Center provided comprehensive professional learning in math and science through Greater Proficiency in Mathematics, Project PRIME, Enhancing Math Instruction for Students with Learning Disabilities, Lake Superior Stewardship Initiative and Michigan Tech Summer Institute Program. These programs focus on strategies that help teachers improve student achievement in their classroom and meet their school improvement goals.

The Western UP Center's student and community programs focused on fostering stewardship of the communities in the Lake Superior Watershed and providing meaningful learning experiences for students and the larger community. The Lake Superior Stewardship Initiative, Water Festival, Outdoor Investigation Field Trip Program, and Green Film Series focused on individual and community actions to preserve the unique ecosystem of Lake Superior Watershed. Afterschool Science Classes, Ride the Waves, Family Science and Engineering Nights engaged students in innovative activities to teach science, technology, engineering and math concepts.

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