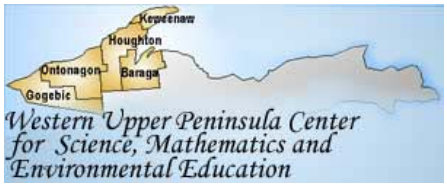
# Western Upper Peninsula Center for Science, Mathematics and Environmental Education 2014-2015 Annual Report




The Western Upper Peninsula (UP) 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.

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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 eight fellows in science classrooms during the 2014-15 school year. For more information, visit www.globalwatershed.mtu.edu.

### Student Programs that Highlight STEM and STEM Careers

The Western UP Center conducted many student programs 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 programs were the Outdoor Science Investigations, Water Festival, GET WISE, TiViTz Math Day, Western UP Science Fair and Festival, and Ride the Waves. More information about these projects is discussed in the Spotlight on Student Services.

## Comprehensive Math Professional Learning Program

Comprehensive sustained professional learning for secondary mathematic teachers was available to districts in the Copper Country and Gogebic-Ontonagon ISD through the Project PRIME and Engaging Students in the CCSS Mathematical Practices. These projects focus on helping teachers implement the Common Core State Standards for mathematics in their classroom and engage all students in mathematical practices. More information about these projects is discussed in the Spotlight on Professional Learning.

## Family Science and Engineering

**Students and their parents attend two 40-minute inquiry-based activities led by Michigan Tech undergraduate and graduate students.**

During 2014-15 school year, ten 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

| | | | Reported Gender** | | Position | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Participants | # of Indiv. | Total Hours | M | F | Admin | Math Tchr | Sci Tchr | Tech Tchr | Comb Subj | Other or Unknown* |
| Pre-School | 1 | 14 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| Elementary | 46 | 662 | 3 | 43 | 0 | 1 | 1 | 0 | 44 | 0 |
| Middle/Jr. High | 20 | 485 | 11 | 9 | 0 | 6 | 9 | 0 | 1 | 4 |
| High School | 35 | 909 | 8 | 27 | 0 | 7 | 15 | 0 | 2 | 11 |
| K-12 Mixed Levels | 21 | 500 | 8 | 13 | 1 | 1 | 6 | 0 | 2 | 11 |
| Other* | 49 | 1,523 | 16 | 32 | 0 | 0 | 2 | 0 | 0 | 47 |
| **Total** | 172 | 4,093 | 46 | 125 | 1 | 15 | 33 | 0 | 50 | 73 |

*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, 23.8 hours of professional learning related to mathematics or science.**

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 | Total |
|---|---|---|---|---|
| **Elementary & Middle/Jr. High** | Activities | 0 | 1 | 1 |
| | Hours | 0 | 9 | 9 |
| | # Participants | 0 | 6 | 6 |
| **Middle/Jr. High** | Activities | 0 | 1 | 1 |
| | Hours | 0 | 1 | 1 |
| | # Participants | 0 | 2 | 2 |
| **Middle/Jr. High & High School** | Activities | 3 | 14 | 17 |
| | Hours | 106 | 159 | 265 |
| | # Participants | 47 | 118 | 165 |
| **Other (includes mixed levels)** | Activities | 0 | 13 | 13 |
| | Hours | 0 | 108 | 108 |
| | # Participants | 0 | 180 | 180 |
| **Total** | Activities | 3 | 29 | 32 |
| | Hours | 106 | 277 | 383 |
| | # Participants | 47 | 306 | 353 |

# *Spotlight on Professional Learning*

Comprehensive sustained professional learning for secondary mathematics teachers was available to districts in the Copper Country and Gogebic-Ontonagon ISD through Project PRIME and Engaging Students in the CCSS Mathematical Practices. These projects focus on helping teachers implement the Common Core State Standards for mathematics in their classroom and engage all students in mathematical practices. Thirty-two teachers participated in the professional learning activities for these programs spanning the summer of 2014, the 2014-15 school year and concluding in the summer of 2015.

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*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 48 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.

*Engaging Students in the CCSS Mathematical Practices* was the result of partnership 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 of program was to 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 2014-2015

| | | Math | Science | Total |
|---|---|---|---|---|
| **Pre-Kindergarten** | Activities | 0 | 1 | 1 |
| | Hours | 0 | 1.5 | 1.5 |
| | # Participants | 0 | 16 | 16 |
| **Elementary** | Activities | 0 | 226 | 226 |
| | Hours | 0 | 458.05 | 458.05 |
| | # Participants | 0 | 5,083 | 5,083 |
| **Elementary & Middle/Jr. High** | Activities | 1 | 9 | 10 |
| | Hours | 5 | 38 | 43 |
| | # Participants | 154 | 732 | 886 |
| **Middle/Jr. High** | Activities | 0 | 13 | 13 |
| | Hours | 0 | 50 | 50 |
| | # Participants | 0 | 1,130 | 1,130 |
| **Middle/Jr. High & High School** | Activities | 0 | 7 | 7 |
| | Hours | 0 | 63 | 63 |
| | # Participants | 0 | 189 | 189 |
| **High School** | Activities | 0 | 19 | 19 |
| | Hours | 0 | 82 | 82 |
| | # Participants | 0 | 832 | 832 |
| **Other (includes Mixed Levels)** | Activities | 0 | 22 | 22 |
| | Hours | 0 | 136 | 136 |
| | # Participants | 0 | 625 | 625 |
| **Total** | Activities | 1 | 297 | 298 |
| | Hours | 5 | 828.55 | 833.55 |
| | # Participants | 154 | 8,607 | 8,761 |

# 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.

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### *Outdoor Science Investigations Program – 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.

### *Water Festival – October 23, 2014*

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.

### *GET WISE – February 24, 2015*

Middle school students participated in full day of activities that introduced them to careers in science, technology, engineering and mathematics. The activities were conducted by professionals from Michigan Tech and the community. The program was made possible by a partnership with Michigan Tech Pre-College Outreach Department.

### *TiViTz Math Day – March 18, 2015*

Students in grades 4-7 participated in the TiVitz Math Competition. TiViTz is a game that builds mathematical fluency and hones strategic competition skills. Between matches, students participated in interactive activities around key concepts in mathematics. The program was made possible by a partnership with Michigan Tech Pre-College Outreach Department and Mathematics Department.

### *Western UP Science Fair and Festival – March 23, 2015*

Students in grades 4-8 participated in the 16th Annual Western Upper Peninsula Science Fair. Students designed projects on science investigations they conducted. Projects 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 9-24, 2015.

### *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 2014-15 school year, there were four Focus Schools in the Western UP Center's service area and there were no Priority Schools. The schools are Houghton Portage Township Elementary School, Houghton Portage Township Middle School, Lake Linden Hubbell Elementary School and LL Wright High School. At the secondary level, the Western UP Center Director targeted administrators to encourage their staff members to participate in the comprehensive sustained professional learning in mathematics that was available through the Project PRIME and Engaging Students in CCSS Mathematical Practice. The entire math department from Houghton Portage Township Middle School and LL Wright High School participated in one or both professional learning programs.

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The Western UP Center Director joined the Copper Country ISD Multiple Tier Systems of Support (MTSS) team during the 2014-15 school year to provide additional support in mathematics to Houghton Portage Township Elementary and Lake Linden Hubbell Elementary. Working with the MTSS team allows the combination of resources from MTSS and Western UP Center to effectively provide resources and support to teachers in these schools.

# *Spotlight on Partnerships*

The Western UP Center for Science, Mathematics and Environmental Education is a partnership of the Copper Country and the Gogebic-Ontonagon Intermediate School Districts and Michigan Technological University (MTU) Center for Science and Environmental Outreach. Western UP Center's staff spent a considerable time and expertise to fostering a wide variety of partnerships to provide quality programming to the 19 school districts in their service area. These partnerships are crucial to the continued operation of the Center. The Center collaborated with various entities during the 2014-15 school year to secure funding to maintain math and science programs for teachers, students and community in the Center's service area.

The Western UP Center brought together businesses, community organizations, local educators and MTU faculty to secure continuation funding through June 30, 2017 from the Great Lakes Fishery Trust and Wege Foundation to implement the Lake Superior Stewardship Initiative (LSSI). LSSI has engaged 15 school-community teams in community based stewardship projects that impact the Great Lakes and their watersheds since January 2008. Approximately 50 community partners collaborate with teachers and students at 15 schools to do this work.

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The Western UP Center collaborated with faculty from various departments at Michigan Tech to secure funding and resources for a wide variety of student and teacher programs.

Teacher Programs

- Great Lakes Investigation Summer Institute
- Global Climate Change Teacher Institute
- Engaging Students in CCSS Standards for Mathematical Practice

Student and Community Programs

- Water Festival
- Lake Superior Celebration
- Green Films Series
- Ride the Waves
- Global Watershed
- Cyber Scientist
- Outdoor Science Investigations
- Family Engineering and Science
- GET WISE
- TiViTz Math Day
- Western UP Science Fair and Festival

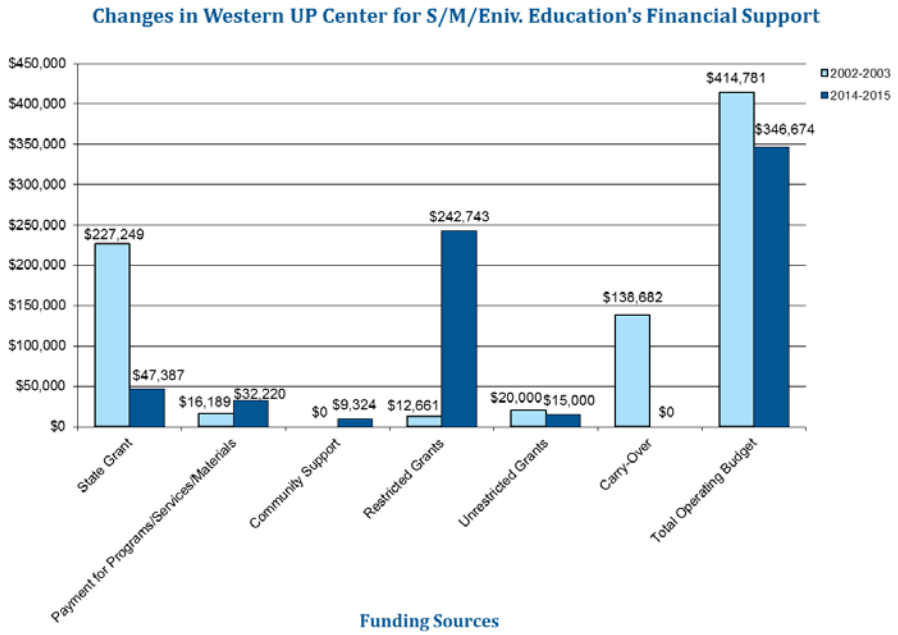
# Director's 2014-2015 Budget Discussion

During the 2014-15 school year, the Western UP Center provided a wide variety of student programs and professional learning opportunities by combining funds from Section 99 with fifteen 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 2014-15 school year.

The Western UP Center charged a fee for family science nights 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 2014-15 school year accounted for 13.7% 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 2015-16 school year will be comprised of Section 99 funds, eight restricted grants and program fees. The operating budget for the 2015-16 school year is approximately 62% of the amount of the operating budget for the 2014-15 school year. Currently, Section 99 funding will contribute 21.9% of the revenue for 2015-16 school year.




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 2014-2015

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 2014-15 school year and into the 2015-16 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, Wege Foundation, 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 Project PRIME, Engaging Students in CCSS Mathematical Practices, 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, Lake Superior Celebration, Outdoor Investigation Field Trip Program, and Green Film Series focused on individual and community actions to preserve the unique ecosystem of Lake Superior Watershed. Western UP Science Fair and Festival, 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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