

# **Western Upper Peninsula Center for Science, Mathematics and Environmental Education 2004-2005 Annual Report**

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The Western Upper Peninsula Center for Science, Mathematics and Environmental Education provides services to 21 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 21<sup>st</sup> century by providing innovative and quality programming for students, teachers and the community.

## **Overview of the Year's Accomplishments**

### **Standards Based Student Programs Focused on Higher Order Thinking and Real World Applications.**

#### Family Science/Math Nights- Grades K-6

- Students and their parents attended two 40-minute inquiry-based activities led by MTU students.
- Elementary students participated in problem solving activities, engineering challenges, investigations designed by MTU students.
- The MTU student presenters were enrolled in an MTU Department of Education 2-credit course titled "Communicating Science." This course prepared university students to be family night presenters by receiving training in teaching methods, classroom management, lesson plan development, and presentation skills.

#### After-School Programs- Grades 1-8

- Six-week long classes were designed to enhance the curriculum at the school and were taught by MTU students that are trained by Center staff to conduct these classes.

#### Forest Field Trip Program Grades 1-6

- The field trips were conducted at school forests, state parks and other wildlife areas in all seasons. Winter field trips are conducted on snowshoes.
- The field trips were conducted by Anne Collins, Americorps member, and two MTU forestry graduate students.

#### Western UP Science Fair and Science Festival- March 21, 2005

Students in grades four through eight communicated their findings on experiments they conducted using scientific method through a science fair project. Students presented their science fair projects to the judges who are local educators or MTU faculty (see page 6).

#### FIRST LEGO League and Regional Tournament- November 13, 2004

MTU Robotic Systems Enterprise and the Western UP Center hosted the Superior Roboworks regional on Saturday, November 13, 2004 at MTU Student Development Complex (see page 6).

#### TiViTz Tournament – May 5, 2005

Student (grades 4-8) participated in the first Upper Peninsula TiViTz tournament. TiViTz is a board game that develops basic mathematics and critical thinking skills.

## Organization of the Report

The Strategic Plan identifies six service areas: Leadership, Professional Development, Student Services, Curriculum Support, Community Involvement, and Resource Clearinghouse. This report will focus on Professional Development and Student Services for the entire service area. In addition, there will be narrative targeting work done with underachieving schools in the area.

### REGION-WIDE PROFESSIONAL DEVELOPMENT

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

#### Who participated?

Professional development opportunities were provided for classroom teachers, classroom support staff, administrators, parents/community members, and others involved in K-12 education. The chart and summary descriptions show who participated.

**Table 1: Participants Receiving Professional Development**

Participants	# of Individ.	Total Hours	Reported Gender		Position					
			M	F	Admin	Math Tchr	Sci Tchr	Tech Tchr	Comb Subj	Other Unknown*
Pre-K	4	32	1	3	1				2	1
Elementary	148	2046.5	21	127	7	1	1		131	8
Middle/Jr. High	41	1223	20	21	1	5	21		4	10
High School	64	1835	21	42	3	15	21	2	1	22
K-12 Mixed Levels & Others*	87	1784.5	35	52	13	6	28	1	9	30
<b>Total</b>	<b>344</b>	<b>6921</b>	<b>98</b>	<b>245</b>	<b>25</b>	<b>27</b>	<b>71</b>	<b>3</b>	<b>147</b>	<b>71</b>

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

Professional development 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. Table 2 on the following page represents a picture of the number of sessions offered and the rate of attendance.

**Teachers, on average, spent 20.1 hours on mathematics, science, or technology professional development.**

**Table 2: Professional Development Activities**

		Math	Science	Other	Total
<b>Elementary</b>	Events	3			3
	Hours	14.5			14.5
	# Participants	95			95
<b>K-8</b>	Events	4			4
	Hours	20.5			20.5
	# Participants	111			111
<b>Middle School &amp; High School</b>	Events	2	5	7	14
	Hours	51	143	83	277
	# Participants	27	57	121	205
<b>High School</b>	Events		1		1
	Hours		2		2
	# Participants		7		7
<b>K-12 Mixed Levels</b>	Events	1	1	8	10
	Hours	4	8	44	56
	# Participants	19	7	148	174
<b>Total</b>	Events	10	7	15	32
	Hours	90	153	127	370
	# Participants	252	71	269	592

## Spotlight on Professional Development

**Preparing “Highly Qualified” Teachers.** The Western UP Center for Science, Mathematics and Environmental Education provided high quality teacher institutes that allow teachers to improve the teaching and learning that occurs in their classroom. Participants received graduate credit from MTU, which can be part of their planned program for certification or highly qualified status. The institutes were funded with grants from Improving Teacher Quality Program, National Science Foundation, U.S. Environmental Protection Agency, Michigan Forest Foundation, U.S. Forest Service, International Paper and Department of Natural Resources, so teachers could attend at greatly reduced rates.

Institutes conducted:

- *Ecology of the Great Lakes aboard the EPA’s R/V Lake Guardian* ~ July 5-10, 2004. Teachers explored the ecological balance of the Great Lakes Watershed aboard the Research Vessel Lake Guardian.
- *Forest Resources and Environmental Sciences* ~ July 12-17 2004 and June 27-July 2, 2005. Teachers developed interdisciplinary lesson plans that use their school forest as the classroom.
- *Global Change* July 11-16, 2005. Teachers were involved in research on global change using the forest ecosystem as the classroom.
- *Exploring Mathematics Through Engineering Application* June 20-25, 2004. Teachers explored ways to teach secondary mathematics through engineering applications.
- *Exploring Science Through Engineering Applications-* June 27- July 1, 2005. Teachers explored ways to teach secondary physical science through engineering applications.

## Student Services

Student services are delivered based on identified needs to improve and enhance mathematics and science 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
- ❖ After-school enrichment opportunities that engage students in the practical application of mathematics and science knowledge.
- ❖ field trips to natural areas to promote environmental stewardship
- ❖ science fairs, LEGO League and TiViTZ tournament

**Table 3: Student Services Activities Provided in 2004-2005**

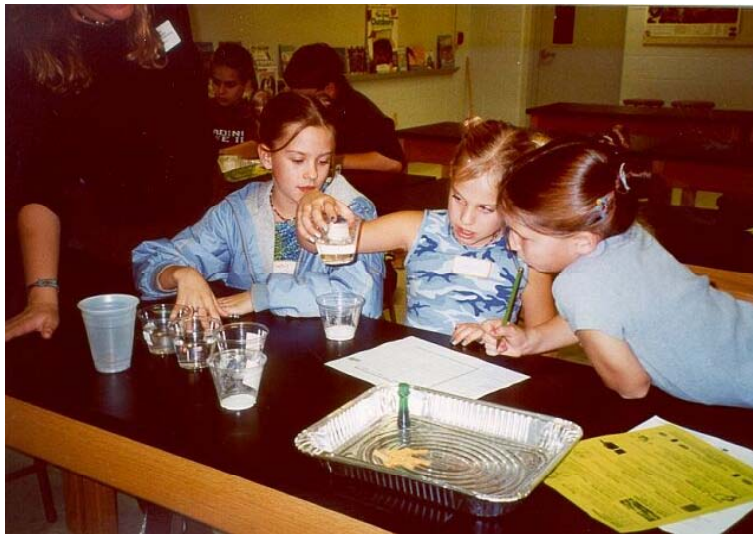
		Math	Science	Technology	Other	Total
<b>Elementary</b>	Events		280			280
	Hours		483.5			483.5
	# Participants		7711			7711
<b>Elementary &amp; Middle School</b>	Events	1	39	2		42
	Hours	4	48	11		63
	# Participants	138	1202	330		1670
<b>Middle School</b>	Events		19	6	1	26
	Hours		28	10.5	5	43.5
	# Participants		721	255	143	1119
<b>Middle &amp; High School</b>	Events		2			2
	Hours		25			25
	# Participants		70			70
<b>High School</b>	Events		13	3		16
	Hours		43	3		46
	# Participants		381	69		450
<b>Other Mixed Levels</b>	Events		2			2
	Hours		3			3
	# Participants		555			555
<b>Total</b>	Events	1	355	11	1	368
	Hours	4	630.5	24.5	5	664
	# Participants	138	10640	654	143	11575



## Spotlight on High-Priority Schools

The school districts in the Copper Country ISD and Gogebic-Ontonagon ISD for the 2004-2005 school year made Annual Yearly Progress at all levels. The Western UP Center for Science, Mathematics and Environmental Education focused on providing vital services that helped school districts meet the mandates of "No Child Left Behind" and improve science and mathematics teaching and learning. The Center offered high quality professional development that addressed these mandates:

- *New Teacher Mentor Workshop Series.* This series of 5 workshops provided new teachers and their mentors with the resources and knowledge to help new teachers create an effective learning experience for their students. This professional development helped teachers and their districts meet the professional development requirement for new teachers.
- *School Improvement Workshop Series.* This series of three workshops guided administrators and school improvement teams on how to lead their teachers, staff, parents, students and community through the process of school improvement. This series will continue with two more workshops in the fall of 2005.
- *Grade Level Content Expectations and 2005 MEAP Tests Workshop Series.* These workshops gave teachers and administrators a working knowledge of the Math and English Language Arts Grade Level Content Expectations and an overview of the Fall 2005 MEAP tests.
- *Creating Mathematics Assessments Workshops.* Teacher learned how to write assessment items to assess the student understanding of the Grade Level Content Expectations. Teachers also critiqued assessment items for effectiveness. The assessment items that the teachers created and critiqued were submitted to the Michigan Mathematics Leadership Database.



## ***What was the impact of the Western Upper Peninsula Center for Science, Mathematics and Environmental Education?***

<p style="text-align: center;"><b>Impact on Students</b></p> <ul style="list-style-type: none"> <li>The number of students that received proficient scores on the 5<sup>th</sup> Grade Science MEAP from 12 elementary schools that actively participate in after-school science programs, ecology field trips, family science nights, school science fairs, Western UP Science Fair and teacher professional development offered by the Western UP Center increased from 2002 to 2005. Proficiency levels increased on the average by 12%.</li> </ul>	<p style="text-align: center;"><b>Impact on Teachers</b></p> <p><u>Teachers become highly qualified through participation in Center programming.</u></p> <ul style="list-style-type: none"> <li>All of the participants in the Western UP Center's Teachers Institutes earned graduate credits from MTU.</li> <li>Participants in Center programs used the graduate credits to meet Highly Qualified requirements or teacher certification requirements.</li> <li>For the participants to earn graduate credit, they created a standards-based teaching unit that they implemented in their classroom.</li> <li>After implementation of teaching unit, participants wrote a paper that reflected on effectiveness of the unit and provided suggestions for improvement.</li> </ul>
<p style="text-align: center;"><b>Impact on Schools</b></p> <p>The schools in the region have come to depend on the Center to provide student programming that enhances their science and math curriculum.</p> <ul style="list-style-type: none"> <li>Many schools were willing to pay for the high quality programming that the Western UP Center offers.</li> </ul> <p>Schools depend on the Center to provide high quality professional development in math, science, school improvement and new teacher training.</p> <p>Schools depend on the Center to provide high quality mathematics and science enrichment activities for students that would otherwise not be possible due to school budgets:</p> <ul style="list-style-type: none"> <li>Afterschool Classes and LEGO League Teams</li> <li>Ecology Field Trips</li> <li>TiViTz Tournament</li> </ul>	<p style="text-align: center;"><b>Impact on Communities</b></p> <p><u>Community Planning</u></p> <ul style="list-style-type: none"> <li>The Western UP Center collaborated with community organizations and Michigan Technological University to sponsored a series of Community Planning workshops for the local community.</li> <li>The workshops focused on how to plan for building an economic, social and environmentally sustainable community.</li> <li>The Western UP Center published <i>Design Guidelines: to Enhance Community Appearance and Protect Natural Resources</i> and <i>Looks Count Middle School Community Design Curriculum</i>.</li> <li>Many city officials and businesses have attended these workshops and some local middle schools used the Looks Count curriculum.</li> </ul> <p><u>Community Involvement</u></p> <ul style="list-style-type: none"> <li>More than 100 MTU faculty, staff and students, as well as, Finlandia students, area teachers, and community members assisted with the Western UP Science Fair and Science Festival—serving as judges or facilitating hands-on science activities for students.</li> </ul>

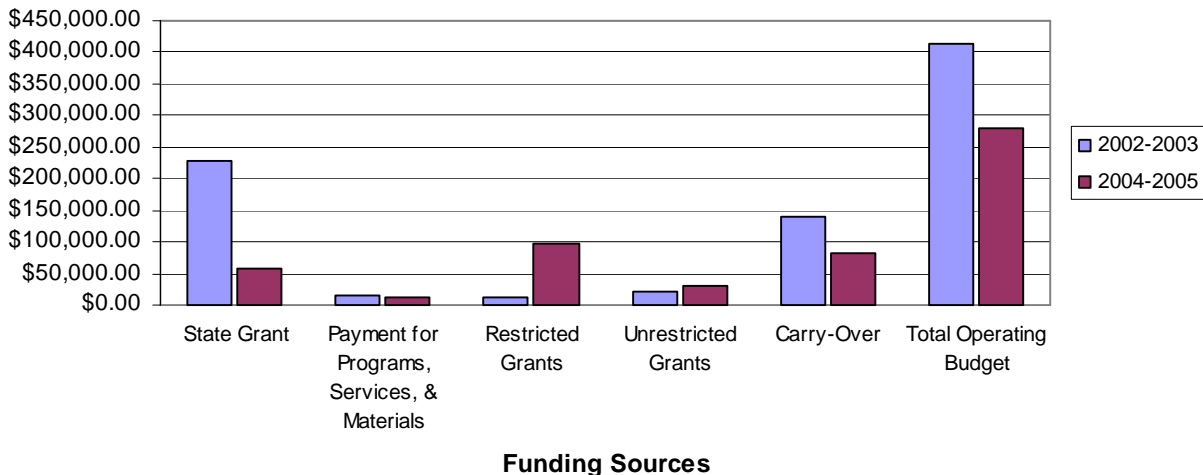
## Director's Budget Discussion

The Section 99 allocation did not provide enough funding to run programming or to provide salary for one full time person. The Western UP Center staff was very aggressive in pursuing other grant funds to maintain programming and staff for the 2004-2005 school year. A substantial amount of time was spent pursuing grant opportunities and collaborative partnerships. The Western UP Center received three grants in the fall of 2003 and three grants in the fall of 2004 that provided funding for the 2004-2005 school year. Four of these grants were Teacher Quality Grants received in collaboration with MTU Education Department to conduct professional development in science, math and social studies. The other two grants were from the Michigan Department of Environmental Quality to write three environmental curriculum units for the Clean Michigan Initiative and the Environmental Protection Agency to provide after-school classes and forest field trips. These grant funds will end in December 2005.

The school districts in the CCISD and GOISD paid a minimal fee for student and family programs offered through the Western UP Center in the 2004-2005 school year. The fee paid for materials and travel but did not pay for staff time. The Western UP Center did not charge for forest field trips and Western UP Science Fair due to grant funds that paid for these programs.

The 2005-2006 school year will be a lean year due to reduction in carryover funds, reduction in other grant funds and Section 99 funding remaining at 25% of full funding. Increased costs for staff benefits and travel for student programs combined with decrease in revenue will leave the Western UP Center with very limited funds to run programming. I predict that the Western UP Center will not have any carryover for the 2006-2007 school year. If the Section 99 funding remains at 25% of full funding, I predict that the Western UP Center will consist of one staff member and very limited programming for the 2006-2007 school year.

**Changes in the Western Upper Peninsula Center's Financial Support**



## Director's Summary

The focus of the Western UP Center for Science, Mathematics and Environmental Education for the 2004-2005 school year was to provide programs that help school districts meet the mandates of "No Child Left Behind" and improve science and mathematics teaching and learning. The Center offered high quality professional development and has been successful in pursuing funding to maintain teacher programs. The Center in collaboration with MTU received two more Teacher Quality Grants to offer professional development in mathematics and physical science over a two-year period. The Center also received a grant from the Environmental Protection Agency to fund a field trip and an after-school science program.

The decreased funding through Section 99 had a profound effect on the Western UP Center's focus. Before the funding issues, the Western UP Center provided student and teacher programming to all districts in the service area. Most of the student programming was done at the school site. Staff or volunteers would drive to schools to conduct field trips, after school science, family programs etc. With the decrease in funding, the Western UP Center put an emphasis on professional development and selected student programs to help districts meet the mandates of "No Child Left Behind". The expensive student programs such as after school science, family science nights were delivered to those schools that could pay part of the cost. Many schools were willing to pay the cost of these programs, but many districts are feeling budget shortfalls and could not purchase the programs.

A substantial amount of staff time was spent pursuing grant opportunities and collaborative partnerships to maintain programming. The Western UP Center submitted or participated as a partner on 21 grant applications during the 2004-2005 school year. Five of the grants were funded which means \$48,000 in restricted grant funding for the Center during the 2005-2006 school year. One of the grants received is the Math Partnership Grant for the Mathematics Building Bridges Project. This grant will provide quality sustained professional development for 20 mathematics teachers in the Western UP Center's service area for two years.

The Western UP Center staff decreased from 5 full time employees to 3 full time employees and one part time employee due to budget cuts. One of the full time employees is an AmeriCorp worker that costs the Western UP Center \$6700 annually. The governance of the Western UP Center has remained the same. The Center is a partnership of the Copper Country Intermediate School District (CCISD) and Gogebic Ontonagon Intermediate School District (GOISD) and Michigan Technological University (MTU) and provides services to schools in the CCISD and GOISD. The CCISD acts as the fiscal agent and the CCISD Board of Education reviews fiscal records.