

## Michigan Environmental Education Curriculum Development Project

### PROJECT OVERVIEW (August 2004)

The Department of Environmental Quality, with funding from the Clean Michigan Initiative (CMI), will produce a series of five science-based middle school environmental education curriculum units to increase students' knowledge of science principles associated with the environment. A series of grants for the development of the five units has been awarded to:

- Western Upper Peninsula Center for Science, Mathematics, and Environmental Education will develop three curriculum units: **Ecosystems** - Pam Schmidt [plschmid@mtu.edu](mailto:plschmid@mtu.edu); **Water Quality** - Joan Schumaker-Chadde [jchadde@mtu.edu](mailto:jchadde@mtu.edu); **Energy & Resources** - Heather Luoto [hluoto@skynet.net](mailto:hluoto@skynet.net).
- Western Michigan University will develop a curriculum unit on **Individuals' Impact on the Land** (Dr. Joe Stoltman ([joseph.stoltman@wmich.edu](mailto:joseph.stoltman@wmich.edu)) and Dr. Lisa DeChano ([geoquack@hotmail.com](mailto:geoquack@hotmail.com))).
- Grand Valley State University Water Resources Institute will develop a curriculum on **Air Quality** (Dr. Janet Vail ([vailj@gvsu.edu](mailto:vailj@gvsu.edu))).
- Dr. Mike Libbee at Central Michigan University is the **overall project coordinator**, including statewide training of curriculum trainers and at least 3,000 teachers.
- Dr. Mark Jenness at SAMPI, Western Michigan University, is conducting the project evaluation.

For more information on the curriculum project, contact Tom Occhipinti (MDEQ) at (517) 373-2379.

#### Curriculum Development Process

5-8 core lessons will be developed for each unit topic. These lessons should form the foundation for understanding the essential concepts related to each topic and relate directly to Michigan. The themes of civic responsibility, environmental sustainability, and cooperative problem-solving will be woven into each curriculum unit.

#### Expert Content Review, Field Review and Teacher Field-Testing of Each Unit

Expert content review, field review, and teacher field-testing of each unit will be conducted by Central Michigan University (Dr. Michael Libbee) from October 2004 through January 2005. Three training workshops for teacher field-testers took place in summer 2004:

- Upper Peninsula (rural) - July 27-28
- Kalamazoo area (suburban) - August 2-3
- Detroit (urban) - August 4-5

The curriculum units will be printed in summer 2005. Approximately 1000 copies of *each* unit will be printed and distributed throughout the State of Michigan.

#### Teacher Professional Development & Statewide Dissemination

Approximately 3,000 teachers will be trained statewide through a 'train the trainer' format. Math/ Science Center staff and others will be trained in the use of the five curriculum units at two 5-day workshops: August 1-5, 2005 at Central Michigan and August 15-19, 2005 at Macomb ISD. These trainers will then train teachers in their local areas. Those interested in participating in the teacher training should contact Mike Libbee

[Michael.Libbee@cmich.edu](mailto:Michael.Libbee@cmich.edu) or Tom Occhipinti [OCCHIPIT@michigan.gov](mailto:OCCHIPIT@michigan.gov) .

## Michigan Environmental Education Curriculum Unit Topics for Middle School Students

(Information below taken from MDEQ Grant Application Package document November 2002)

Unit Topic	Environmental Focus	Suggested Scientific or Ecological Concepts	Grade & Subject
<b>1. Ecosystem</b>	Changes in Ecological Systems	<ul style="list-style-type: none"> <li>➤ Population &amp; Community</li> <li>➤ Habitat</li> <li>➤ Biodiversity</li> <li>➤ Exotic species</li> <li>➤ Food chain/web</li> <li>➤ Nutrient cycle</li> <li>➤ Biological amplification</li> </ul>	Gr. 4-6  Science Social Studies
<b>2. Individuals Impacts on the Land</b>	Impacts	<ul style="list-style-type: none"> <li>➤ Point &amp; non-point source pollution</li> <li>➤ Watersheds</li> <li>➤ Brownfield redevelopmt.</li> <li>➤ Succession</li> </ul>	Gr. 4-6  Science Social Studies
<b>3. Water Quality</b>	Surface and Groundwater	<ul style="list-style-type: none"> <li>➤ Water cycle</li> <li>➤ Water quality monitoring</li> <li>➤ Groundwater processes</li> <li>➤ Degradability</li> <li>➤ Toxicity</li> <li>➤ Chemical pollutants</li> <li>➤ Watersheds</li> </ul>	Gr. 6-8  Science Social Studies
<b>4. Air Quality</b>	Trans-boundary Air Pollution and Great Lakes Climate Change	<ul style="list-style-type: none"> <li>➤ Airshed</li> <li>➤ Criteria pollutants</li> <li>➤ Chemical reactions</li> <li>➤ Ozone</li> <li>➤ Air quality monitoring</li> <li>➤ Acid precipitation</li> </ul>	Gr. 6-9  Science
<b>5. Energy Resources*</b>	Pollution Prevention And Energy Conservation	<ul style="list-style-type: none"> <li>➤ Matter &amp; energy</li> <li>➤ Renewable &amp; non-renewable energy</li> <li>➤ Hazardous &amp; non-hazardous wastes</li> </ul>	Gr. 6-9  Science Social Studies

### Each curriculum unit must provide opportunities for students to:

- Understand and accurately apply appropriate science concepts, principles, laws and theories.
- Use and interpret data.
- Examine Michigan issues in regional, national, or global context.
- Write an essay or make a presentation.
- Discuss how individual decisions have an impact on the environment.
- Engage in hands-on activities.
- Participate in web-based inquiry and activities.

### Each curriculum unit must include the following deliverables:

- 5-8 lesson plans per unit.
- Unit objectives---what the student will learn (skills and knowledge).
- Correlate to Michigan curriculum frameworks.
- Poster on each major topic.
- Student resources, including black-line readings, graphics, and data (reproducible).
- Classroom set of resources---full-color maps, diagrams, readings.
- Teacher resources including overhead transparencies, masters, etc.
- List of additional resources, materials, activities related to each topic or theme.
- MEAP-like pre-test and post-test assessment instruments.
- Glossary
- Feedback and evaluation form for the purpose of updating future editions.