

Water Quality Unit Development Team

Water Quality Unit Development Coordinator and Lead Writer

Joan Schumaker-Chadde
Education Program Coordinator
Western Upper Peninsula Center for Science, Mathematical and Environmental Education
Michigan Technological University

Curriculum Development Coordinators: Ecosystems & Biodiversity, Energy Resources and Water Quality Units

Shawn Oppliger Director
Western Upper Peninsula Center for Science, Mathematics and Environmental Education

Joan Schumaker-Chadde, Education Coordinator
Western Upper Peninsula Center for Science, Mathematics and Environmental Education
Michigan Technological University

Water Quality Unit Curriculum Team Members

Dr. Marty Auer, Professor
Department of Civil and Environmental Engineering, Michigan Technological University

Heather Bradway, Science Teacher, Hancock Middle School

Wil Cwikel, Water Policy Specialist
Tipp of the Mitt Watershed Council

Dr. Shari Dann, Professor
Department of Fisheries and Wildlife
Michigan State University

Margaret Ehiemere, Science Teacher, Ferndale Middle School

Amy Keranen, Environmental Specialist
Remediation and Redevelopment Division
Michigan Department of Environmental Quality

Dr. Alex Mayer, Professor
Geological and Mining Engineering and Sciences
Michigan Technological University

Dr. Janet Vail, Associate Professor
Michigan Project WET Coordinator
Annis Water Resources Institute
Grand Valley State University



**Michigan Department of Environmental Quality
Environmental Education Curriculum Development Advisory Committee:**

Theron Blakeslee, Ph.D.; former Science Education Consultant
Michigan Department of Education

Linda Humphreys, former Environmental Education Consultant
Michigan Department of Environmental Quality

Mozell Lang, former Science Specialist
Michigan Department of Education

Kevin Frailey, former Director of Information and Education
Michigan United Conservation Clubs

Jason Dinsmore, Resource Policy Assistant
Michigan United Conservation Clubs

Tom Green, former Director
Hillsdale, Lenawee and Monroe Math, Science, and Technology Center

David J. Larwa, former Science Consultant
Michigan Department of Education

Michael Libbee, Ph.D.; Professor of Geography
Central Michigan University

Barbara Neureither, Academic Specialist
Michigan State University

Thomas M. Occhipinti, Environmental Education Coordinator
Michigan Department of Environmental Quality

Janet Vail, Ph. D.; Associate Professor
Annis Water Resources Institute, Grand Valley State University

State of Michigan Project Manager

Thomas M. Occhipinti, Environmental Education Coordinator
Michigan Department of Environmental Quality

State of Michigan Education Advisor

Kevin Richard, Science Consultant
Michigan Department of Education

Online Interactive Web Modules Development Team

Module Development Coordinator

Dr. Marty Auer, Professor
Department of Civil and Environmental Engineering
Michigan Technological University

Tech Alive Webmaster & Animator

Sue Hill, Department of Civil and Environmental Engineering
Michigan Technological University

Student Authors

Groundwater Contamination

Mat Babcock
Department of Civil and Environmental Engineering
Michigan Technological University

Water and Wastewater Treatment

Aubrey Frazer
Department of Civil and Environmental Engineering
Michigan Technological University

Groundwater Supply

Cory McDonald
Department of Civil and Environmental Engineering
Michigan Technological University

Watershed Concept

Ravi Shrestha
Department of Civil and Environmental Engineering
Michigan Technological University

Water Pollutant Sources and Impacts

Heidi Ochsner
Department of Civil and Environmental Engineering,
Michigan Technological University

Stream Monitoring

Paul Kennedy
Department of Civil and Environmental Engineering
Michigan Technological University

Water Quality Web Module Descriptions

(http://tecalive.mtu.edu/meec_index.htm)

Watershed Concept

All of the water on Earth is stored in the oceans, ice caps and glaciers, groundwater, lakes, atmosphere, rivers, plants, animals, and soil. It is the movement of this water, via precipitation, runoff, evaporation, transpiration, and infiltration that has the potential to move pollutants from one place to another. Watersheds are all of the land area draining water (through runoff) into a particular stream, river or lake. Track the movement of water through the hydrologic cycle and explore ways in which scientists and engineers work to manage water resources. Supports Lesson 3.

Water Pollutant Sources and Impacts

Pure water, H₂O, is hard to find outside of the laboratory. As water moves over and through the earth, it may pick up natural chemicals which become dissolved in the water or pollutants placed on the land. These pollutants can have harmful effects on both aquatic and terrestrial ecosystems, if present in high enough concentrations. The types of pollutants, their sources, pathways, impacts, and strategies to control their impacts will be described. Supports Lessons 4 and 9.

Groundwater Supply

Where does groundwater come from and where does it go is the focus of this module. Explore how ground water moves through the water cycle, the concepts of porosity and permeability and how they are influenced by soil characteristics, how groundwater is pumped to provide for many human uses, proper precautions in siting a new well, and some current issues related to ground water management and use. Supports Lesson 5.

Groundwater Contamination

The contamination of groundwater, which supplies drinking water for one-third of the U.S. population and one-half of Michigan's residents, is a serious health and environmental concern. During this investigation you will learn about the sources and impacts of groundwater contaminants, how groundwater contamination is investigated, and some possible ways to clean up and prevent groundwater contamination. Students engage in a groundwater contamination investigation to determine the size, direction of flow, and rate of movement of a contamination plume. Supports Lesson 5.

Stream Monitoring

What do foresters, environmental engineers, fisheries biologists, teachers, and maybe even your neighbor have in common? They are just some of the many people that use monitoring to assess the quality of streams and rivers. In this module, students will learn how to assess a stream's health by evaluating physical stream measurements, water chemistry, bioindicators, and streamside habitat assessment. Students will observe changes in a stream as a result of natural and human actions, and be able to identify the characteristics of healthy and unhealthy streams. Supports Lesson 7.

Water and Wastewater Treatment

Most drinking water provided for human consumption requires treatment in order to make it safe. Wastewater from households and industrial processes must be treated before being discharged to rivers and lakes to ensure the safety of the water for human recreation and to protect fish populations and aquatic ecosystems. While modern technology seeks to address these water quality cleanup requirements, the introduction of new and different pollutants and the need to design treatment technologies that are both economical and effective continues to provide a challenge to communities and industry. In this module, students examine why treatment is needed, the types and potential impacts of various water pollutants, and several treatment techniques. Protecting the water quality of private wells and public water supply facilities, and providing wastewater treatment aboard the international space station are explored. Supports Lessons 6 and 9.

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Rob Aho, Civil Engineer
USDA Natural Resources Conservation Service

Sharon Bajema, Science Teacher
Ottawa Hills High School
Grand Rapids, MI

Jim Baker, President
Copper County Chapter of Trout Unlimited

Bruce Belmas, Science Teacher
Houghton Middle School
Houghton, Michigan

Kristine Bradof, Community Programs Coordinator
GEM Center for Science and Environmental Outreach
Michigan Technological University

Heather Bradway, Science Teacher
Hancock Middle School
Hancock, MI

Sharon Baker, Aquatic Biologist
Aquatic Nuisance Control and Remedial Action Unit
Water Bureau
Michigan Department of Environmental Quality

Ellie Bunzendahl, Technical Assistant
Department of Civil and Environmental Engineering
Michigan Technological University

Betty Cangemi, Science Teacher
L'Anse High School
L'Anse, MI

Gary Cousino, Science Teacher
Hart Middle School
Rochester Hills, MI

JoAnn Dimond, Environmental Quality Analyst
Water Bureau
Michigan Department of Environmental Quality

Jean Dunstan, Science Teacher
Stanton Township Schools
Atlantic Mine, MI

Kay Edly, Aquatic Biologist
Surface Water Quality Assessment Section, Water Division
Michigan Department of Environmental Quality

John Esch
Remediation and Redevelopment Division
Michigan Department of Environmental Quality

George Granderson, Science Curriculum Specialist
Detroit Public Schools

Bill Griffin, U.P. Engineers and Architects

Dorothy Horan, Science Curriculum Specialist
Midland Public Schools

Barbara Johnson, Science Teacher
Monroe Public Schools

Amy Kohlhepp, Compliance Assistance Analyst
Environmental Science and Services Division
Michigan Department of Environmental Quality

Gary Kohlhepp, Aquatic Biologist
Surface Water Quality Assessment Section, Water Division
Michigan Department of Environmental Quality

Wayne Kukuk
Surface Water Protection Unit, Water Bureau
Michigan Department of Environmental Quality

Elizabeth LaPorte, Communications Director
Michigan Sea Grant
National Sea Grant College Program

Jo Latimore, Huron River Watershed Council and MiCorps

Mike Mansour, Science Teacher (formerly)
Lamphere Public Schools

James Nicholas, Director
USGS Michigan Water Science Center
Lansing, MI

Dan Poux, Earth Force GREEN

Courtney Shosh, Friends of the Rouge (formerly)

Bill Taft, Aquatic Biologist
Surface Water Quality Assessment Section, Water Division
Michigan Department of Environmental Quality

Heather Van Den Berg
Clinton River Watershed Council (formerly)

Dr. Janet Vail, Associate Professor
Michigan Project WET State Coordinator
Annis Water Resources Institute
Grand Valley State University

Jessica Wagenmaker, Science Teacher
Holton Middle School
Holton, MI

Katie Walch, Science Education Specialist (formerly)
Western Upper Peninsula Center for Science, Mathematics
and Environmental Education

Dr. David Watkins, Professor
Department of Civil and Environmental Engineering
Michigan Technological University

Special thanks to the following for reviewing portions of the Water Quality Unit:

Organization & Agency Focus Groups – 2004

Kevin Richard, Michigan Department of Education
Mike Johnston, Michigan Manufacturers Association
Linda Humphreys, Earth Force
Douglas Finley, Michigan Department of Natural Resources
Tom Green, Bolles Harbor Mathematics and Science Center
Monroe Public Schools
Jason Dinsmore, Michigan United Conservation Clubs
Jeanne Lipe, Michigan Department of Agriculture
Andy Such, Michigan Chemistry Council
Lynn Dominguez, Michigan Alliance for Environmental
and Outdoor Education

Educator Focus Groups – 2004

Carolyn Wetzler, Symans Elementary School
Al Lewandowski, Port Huron Northern High School
Sharon Goralewski, Oakland Public Schools
Marjane Baker, Tonda Elementary School
Lon VanBronkhorst, Grand Rapids Public Schools
Karen R. Todorov, Michigan Department of Education
Kathy Dewsbury-White, Ingham ISD
John Clark, Ithaca Public Schools
Carol McCaul, Shepherd Public Schools
Bruce Patterson, Harrison Community Schools
Tom Wessels, Traverse Bay Area ISD
David Bydlowski, Wayne RESA
Becky Goche, U.S. Fish and Wildlife Service

Water Quality Field Test Teachers

Laura Amatulli
Avondale Meadows
Avondale, MI
Grade 6

Heather Bradway
Hancock Middle School
Hancock, MI
Grade 8

Kerin Carlson
Lincoln High School
Ypsilanti, MI
Grades 9-12

Lori Crouch
DaVinci Primary
Jackson, MI
Grades 6-8

Michael Donahoe
Monroe Middle School
Monroe, MI
Grade 6

Keith Eldred
Williamston Middle School
Williamston, MI

John Evashevski
St. Ignace Middle School
St. Ignace, MI
Grades 7-8

Amy Giroux
St. Mary's School
Spring Lake, MI

Michael Griskie
Oakbrook Elementary
Utica, MI
Grades 5-6

Kathy Hoeksema
Crystal Middle School
Crystal, MI
Grade 6

Rebecca Johns
Troy High School
Troy, MI
Grade 9

Nancy Klein
Smith Middle School
Troy, MI

Terry Kuseske
Patrick Hamilton Middle School
Dowagiac, MI
Grade 6

John Maki
Rudyard Middle School
Rudyard, MI
Grade 6

Shelly Mattson
Oakridge Middle School
Oakridge, MI
Grade 8

Caleb Miller
New Lothrop High School
New Lothrop, MI
Grades 8-12

Sue McCarty
Springview Elementary
Flushing, MI
Grade 6

Emily McKenna
Belding Middle School
Belding, MI
Grade 7

Deborah Monteath
Avondale Meadows
Avondale, MI
Grade 6

Linda Pietrzak
I.E. Cary
Waterford, MI
Grade 8

Cheryl Richmond
Evert Middle School
Evert, MI
Grade 6

Dan Roraff
Roberts Elementary
Shelby Township, MI
Grades 5-6

Pam Roth
Caseville Elementary School
Caseville, MI
Grades 6-12

Deborah Sage
Houghton Middle School
Houghton, MI
Grade 7

Kristi Saunders
Queen of the Miraculous Medal
Jackson, MI
Grade 6

Andrew Sawyer
Brookview Montessori School
Benton Harbor, MI

Jessica Wagenmaker
Holton Middle School
Holton, MI
Grade 7

David Wagner
New Era Christian
New Era, MI
Grades 7-8

Water Quality Teacher Trainers

Amy Boerma
Mount Pleasant Christian Academy
Mt. Pleasant, MI
Grades 7-12

Michael Broughton
Huron-Clinton Metroparks
Kensington Nature Center
Milford, MI

Chuck Delpier
Negaunee Public Schools
Negaunee Middle School
Grade 8

Sheryl Busch
Lenawee ISD
Adrian, MI
Grade 6

Michele Glenn
Cadillac Middle School
Detroit, MI
Grades K-8

Kelly Heid
GVSU Regional Math & Science Center
Allendale, MI

Greg Jacobs
Clear Lake Education Center
Delta-Schoocraft ISD
Escanaba, MI

Becky Josephson-Gorinac
Sanilac County Science/Math Center at
Sanilac Intermediate School District
Peck, MI
Grades K-12

John Kish
Imlay City Middle School
Imlay City, MI
Grade 8

Dave Krebs
Muskegon Area Regional
Science/Math Center
Muskegon, MI
Grades K-12

Kathryn Koch
Center Line High School
Center Line, MI
Grades 9-12

Julie Leavitt
South Haven Public Schools
Baseline Middle School
Grade 7

Jessica Luxford-Wagenmaker
Holton Public Schools
Holton Middle School
Grade 7

Shelly Mattson
Oakridge Public Schools
Oakridge Middle School
Grade 8

Joy McFadyen
Hampton Elementary
Bay City Public
Grade 5

Karen Meyers
GVSU Regional Math & Science Center
Allendale, MI

Carolyn Northey
Marquette Area Public Schools
Grades 7-8

Linda Pietrzak
Waterford School District
I. E. Crary Middle School
Grades 7-8

Kristina Rider
Brimley Area Schools
Brimley Elementary
Grade 5

Patricia Sanders
Lenawee ISD
Adrian, MI

Diana Schulz
Laker Junior High
Pigeon, MI
Grades 7-8

Deborah Scott
Detroit Public Schools
Denby Tech/Prep High School
Grades 9-12

Margaret Smigielski
Detroit Public Schools
Carleton Middle School
Grades 6-8

Carol Spencer
Waterford Mott High School
Waterford, MI

Cindy Stock
Gladstone Area Schools
Gladstone Middle School
Grade 6

Jennifer Tapolcai
Clear Lake Education Center
Delta-Schoocraft ISD
Escanaba, MI
Grades K-12

Scott VanBonn
Hopkins Public Schools
Hopkins Middle School
Grade 7

Lauaren West-Morton
Detroit Public Schools
Denby Tech/Prep High School