

Fall 10-2001

## Water Resources Review - Fall 2001 Vol 14 No 2

Annis Water Resources Institute

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# Review

Grand Valley State University • R. B. Annis Water Resources Institute • Fall 2001 • Volume 14, Number 2

## In this Issue...

State Of The Lake...page 2

Dedicating Lake Michigan Center...page 3

Muskegon River Update...page 4

New Initiative In Muskegon...page 5

Habitat Assessment Of The White River...page 6

Stormwater Management...page 7

New Scientist...page 7

2001 Tour...page 8

Outreach Activities...page 9

Splash With Project WET...page 9

Rogue River Continues...page 10

New Website Unveiled...page 10

Septage Management In Kent County...page 11

AWRI Internship Opportunities...back cover

## AWRI Welcomes New Director

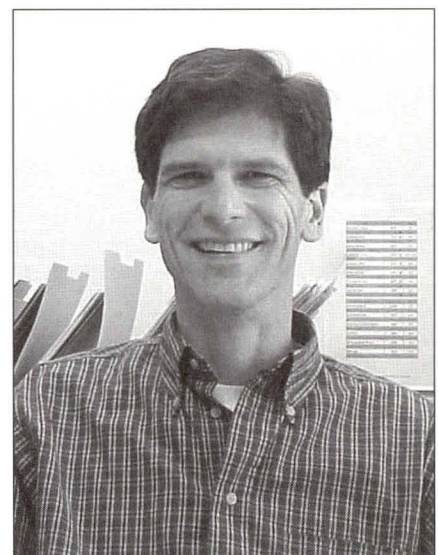
On August 15, 2001 Dr. Alan D. Steinman took over directorship of the Annis Water Resources Institute, replacing retired director Dr. Ronald W. Ward. Dr. Steinman brings to the Institute a variety of career experiences. Steinman received his Bachelors of Science Degree from the University of Vermont in 1979, where he majored in Botany. His honors thesis focused on the limnology of Burlington Harbor. He took a year off between his B.S. and starting his Masters of Science Degree, working for the State of Vermont as a park ranger.

He also majored in Botany at the University of Rhode Island, in Kingston, Rhode Island, where he received his M.S. in 1983 working on algae in the streams and rocky intertidal zones throughout the state. His presentation on this thesis research resulted in the Best Student Paper Award at the Northeast Algal Symposium, held at the Woods Hole Oceanographic Institute.

Steinman pursued his Ph.D. in Aquatic Ecology at Oregon State University, in Corvallis, Oregon. While there, he studied the impacts of the Mt. St. Helens eruption on local streams and lakes, analyzed the impacts of geomorphology on stream ecosystem processes, studied the impacts of nonpoint source

pollution on Crater Lake, and conducted his dissertation on the impacts of aquatic herbivores on the taxonomic and biochemical composition of stream algae. He received his Ph.D. with honors in 1987.

Following his Ph.D., Steinman continued his research on stream ecosystems by accepting a Postdoctoral Fellowship at Oak Ridge National Laboratory (ORNL), in Oak Ridge, Tennessee. While there, Steinman studied the factors that contribute to stream recovery after disturbance, looked at the role that bryophytes (mosses and liverworts) play in streams, and used radioisotopes to



Dr. Alan D. Steinman



# Lake Michigan: State Of The Lake 2001

On November 6 and 7, 2001, AWRI is convening the *Lake Michigan: State of the Lake 2001* conference in Muskegon. Speakers from throughout the Lake Michigan basin and beyond are presenting research results, program information, and interactive workshops. The conference is funded by the U.S. Environmental Protection Agency (EPA) Region 5 and Grand Valley State University.

According to Judy Beck of the EPA, conference participants will be given an opportunity to respond to draft targets and suggested indicators for the environmental status of Lake Michigan. This will provide important information for the update of the Lake Michigan Lakewide Management Plan.

The keynote speaker for the conference is Dr. Elena Kuzevanova of the Limno-

logical Institute of the Russian Academy of Sciences, who will speak on Lake Baikal-Lake Michigan Partnerships. Sessions include fisheries and



lake biology, fate of contaminants in Lake Michigan, coastal watersheds and restoration, and environmental monitoring and assessment. There are workshops on Aquatic Nuisance Species, the Lake Michigan Potential Damages Study, and Recreational Water Quality. A special poster session will be held at the GVSU Lake Michigan Center.

The U.S. EPA Lake Michigan Forum will hold a quarterly meeting in conjunction with the conference. On November 8, the Lake Michigan Monitoring Coordination Council will also be meeting in Muskegon.

For the latest conference information, see the AWRI website at <http://www.gvsu.edu/wri> or contact the conference chair, Dr. Janet Vail, at [vailj@gvsu.edu](mailto:vailj@gvsu.edu) or (616) 895-3048.

## New Director

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look at nutrient cycling in stream ecosystems. He became a Senior Scientist at ORNL and stayed there for 6 years, also serving as Adjunct Professor at the University of Tennessee and teaching Stream Ecology.

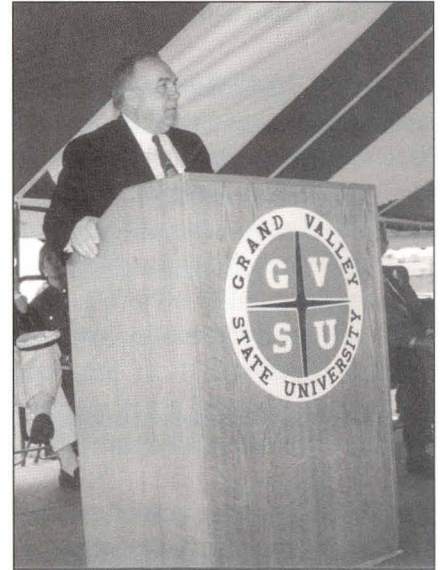
In 1993, Steinman accepted a position in San Diego, California with SAIC, one of the largest scientific consulting firms in the world. His position as Senior Scientist and Project Manager involved overseeing the ecological impacts of diverting the flow of the Tijuana River in San Diego County, and was an Adjunct Professor in Biology at San Diego State University. While in San Diego, he was recruited to join the South Florida Water Management District in West Palm Beach, Florida.

Steinman started as a supervising Professional Environmental Scientist at the Water Management District, overseeing and conducting research on the Kissimmee River restoration project, Lake Okeechobee, and the estuaries that connect Lake Okeechobee to the Gulf of Mexico and the Atlantic Ocean. By the time he left the Water Management District to join GVSU, he was the Director of the Lake Okeechobee Restoration Program, which involved the oversight of 50 staff and a budget of \$30 million involved in research, planning, construction, and regulation. Although the work was challenging, the constant demands on his time and political pressures associated with his position ultimately resulted in Steinman seeking a new work environment.

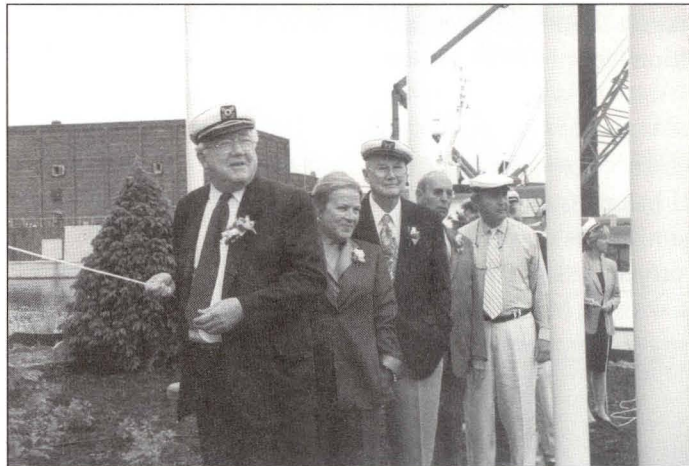
Dr. Steinman is thrilled to have been selected as Director of the Annis Water Resources Institute. The position allows him to become more actively involved in research, while helping the Institute reach the next level in terms of visibility and reputation. Steinman was impressed by the strong foundation already laid by the staff and previous Director, Dr. Ron Ward, which helped attract him to the position. His future goals are to hire additional research scientists to fill the gaps that currently exist, increase the linkages between AWRI and GVSU's main campus through collaborative projects and teaching assignments, and diversify the extramural funding support to the Institute.

# Lake Michigan Center Dedicated

The Lake Michigan Center, which serves as the new home of the Robert B. Annis Water Resources Institute, features a 24,500 square foot research facility with two classrooms and four laboratories. It also houses administrative offices and conference rooms.



The new facility was dedicated on Thursday, June 21, 2001 at 5:00 p.m. Speakers included Governor John Engler, retiring GVSU President Arend D. Lubbers, campaign chair Charles E. Johnson, Richard DeVos, State Senator Leon Stille, and Muskegon Community Foundation President Chris McGuigan. Following the speeches there was a ribbon cutting ceremony, and then a reception and tours of the building. University Development estimates 1,000 guests were in attendance for the event.



Other LMC visitors have included the New Generation Group from the Community Foundation for Muskegon County, the West Michigan Sustainable Business Forum, mayors from Korea, the Michigan Attorney General Jennifer Granholm, various legislators including U.S. Representative Pete Hoekstra and U.S. Senator Debbie Stabenow, community leaders, researchers, and many others. The LMC has been used for a public hearing, press conferences, meetings, GVSU events, and community functions.

# Update To The Muskegon River Watershed 319 Project...

On June 1, 2000, the Annis Water Resources Institute (AWRI) received a Watershed Management Planning Grant for the Muskegon River Watershed from the U.S. Environmental Protection Agency and the Michigan Department of Environmental Quality (DEQ). The grant and awarded funds were authorized by Section 319 of the Federal Clean Water Act and are being used to develop a Watershed Management Plan.

The DEQ has never before awarded a grant of this type for such a large watershed. The size of the Muskegon River Watershed has made it necessary to develop and test new approaches and techniques for gathering and disseminating information about problems and potential solutions for nonpoint source pollution.

Due to the immense size of this undertaking, AWRI has partnered with several other organizations to successfully complete the project tasks. The AWRI, in conjunction with the Muskegon Conservation District, is creating and implementing a public information and education outreach program targeting a variety of audiences. As part of the information gathering process, the Muskegon Conservation District has held four focus group sessions throughout the Muskegon River Watershed to learn more of those concerns and issues that are important to watershed residents. These focus groups were held in Fremont (Newaygo County), Paris (Mecosta County), Falmouth (Missaukee County), and Howard City (Montcalm County). Through this process, project partners have been able to tailor information and education programs that are specific to the needs of watershed residents. For example, a Lakeshore and Streambank Workshop

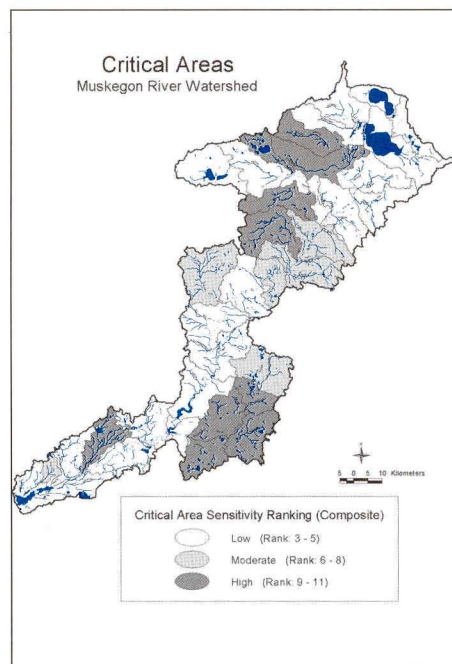
was held in Roscommon (May 18), a Land Use & Water Quality Presentation was given to Missaukee Township Officials (July 25), and a Creative Natural Landscapes Workshop was presented in Muskegon (September 8). At least three more of these information and education workshops will be held at various locations throughout the watershed.

ected officials, and local government staff throughout the Muskegon River Watershed will receive training regarding planning and development issues.

Westshore Consulting, Inc. is producing a report summarizing all of the known hydrological data that exist for the Muskegon River Watershed. This includes data from sources such as Consumers Energy and the Department of Natural Resources Institute for Fisheries Research.

A critical areas analysis was completed for the Muskegon River Watershed this past spring. The critical areas analysis marks those areas where conditions exist for water quality impairment to occur. The analysis, done on a sub-watershed scale, was based on the amount of developed land use (agricultural and urban), the amount of hydrological input to streams as surface runoff, and the temperature fluctuation in cool water streams. Some of the critical areas in the Muskegon River Watershed include Brooks Creek, Little Muskegon River, Tamarack Creek, Middle Branch River, Butterfield Creek, and the West Branch of the Muskegon River sub-watersheds. To gather additional and more in-depth information for the Muskegon River Watershed Management Plan, two pilot project areas were chosen for further study. These areas were the sub-watersheds of the Tamarack Creek and the Middle Branch River. Pilot project activities include a road/stream crossing inventory, macroinvertebrate sampling, temperature probe readings, streambank erosion surveys, and a physical inventory.

A draft of the Management Plan is due in November 2001, with a project end date of May 31, 2002. After the final



The West Michigan Shoreline Regional Development Commission and the consulting firm of Langworthy, Strader, LeBlanc & Associates are working with the AWRI and several local units of government in the watershed to develop model ordinances that minimize water quality impacts. Three townships (Croton, Brooks, and Muskegon Charter) were chosen to implement 'water friendly' model ordinances. Once the development of these model ordinances is complete, planning commissioners,

# Wege Foundation Supports New Muskegon River Initiative

In August 2000, approximately 25 researchers from six Michigan universities joined 25 stakeholders in a four-day conference to consider ways to enhance our understanding of the Muskegon River Watershed. This conference had as its goal to identify ways “to educate as many people as possible, as soon as possible, on the intrinsic value of the natural Great Lakes system being left intact for the coming generations”. What resulted from this meeting was a series of collaborative proposals. These proposals were subjected to a peer review process prior to their submittal to potential funding agencies. The Spring 2000 edition of the *Water Resources Review* highlighted one of the proposals offered by Grand Valley State University (GVSU), Michigan State University (MSU), and the University of Michigan (UM) in an article titled, “We Call It The ‘Mega Model’”.

In June of this year, the Wege Foundation announced its support for another GVSU-MSU collaborative project titled, “Building A Sustainable Future For The Muskegon River Watershed: A Decentralized Approach”. This \$904,960 project starts with an update of existing 1978 land use and land cover information for the entire Muskegon River Watershed. MSU’s Center for Remote Sensing will conduct the initial analysis of 1998 aerial photography. GVSU will sample the data provided by MSU and visit selected sites to ensure interpretation accuracy. Once these data are compiled, GVSU and MSU researchers will create a number of tools specifically intended for local decision-makers. Included are a map atlas, land use change analysis, and computer models developed to predict future urban growth and its impact on natural systems. The Nature Conservancy, the Land Conser-

vancy of West Michigan, and the planning consultant Langworthy, Strader, LeBlanc & Associates, will join GVSU and MSU to present these tools and innovative planning concepts to local officials with responsibility for land use decisions.

The Sustainable Future Project is a three-year project due to be completed by May 2004. For more information, contact John K. Koches, Senior Program Manager, Information Services Center, at [kochesj@gvsu.edu](mailto:kochesj@gvsu.edu) or (616)895-3792.

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## 319 Update

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Management Plan is complete, there will be a one-year transition phase between planning and implementation. During this period, the Project Manager, Sarah U’Ren will continue to gather information and facilitate public education activities about the Muskegon River Watershed Project. It is hoped that necessary funding will be made avail-

able so that the implementation phase of the project can begin January 2003.

For more information on this project please visit our website at [www.gvsu.edu/wri/isc/muskegon](http://www.gvsu.edu/wri/isc/muskegon) or contact Project Manager Sarah U’Ren at [urens@gvsu.edu](mailto:urens@gvsu.edu) or 616-895-3789.



# A Preliminary Habitat Assessment Of The White River Watershed Underway

The Environmental Research Group received a grant from the Community Foundation for Muskegon County (CFMC) to conduct a preliminary habitat assessment of the White River watershed. The grant is part of the White River Partnership that was established by gifts from Howmet Corporation and the Alcoa Foundation. The partnership was established to build critical organizational infrastructure and information resources for the watershed.

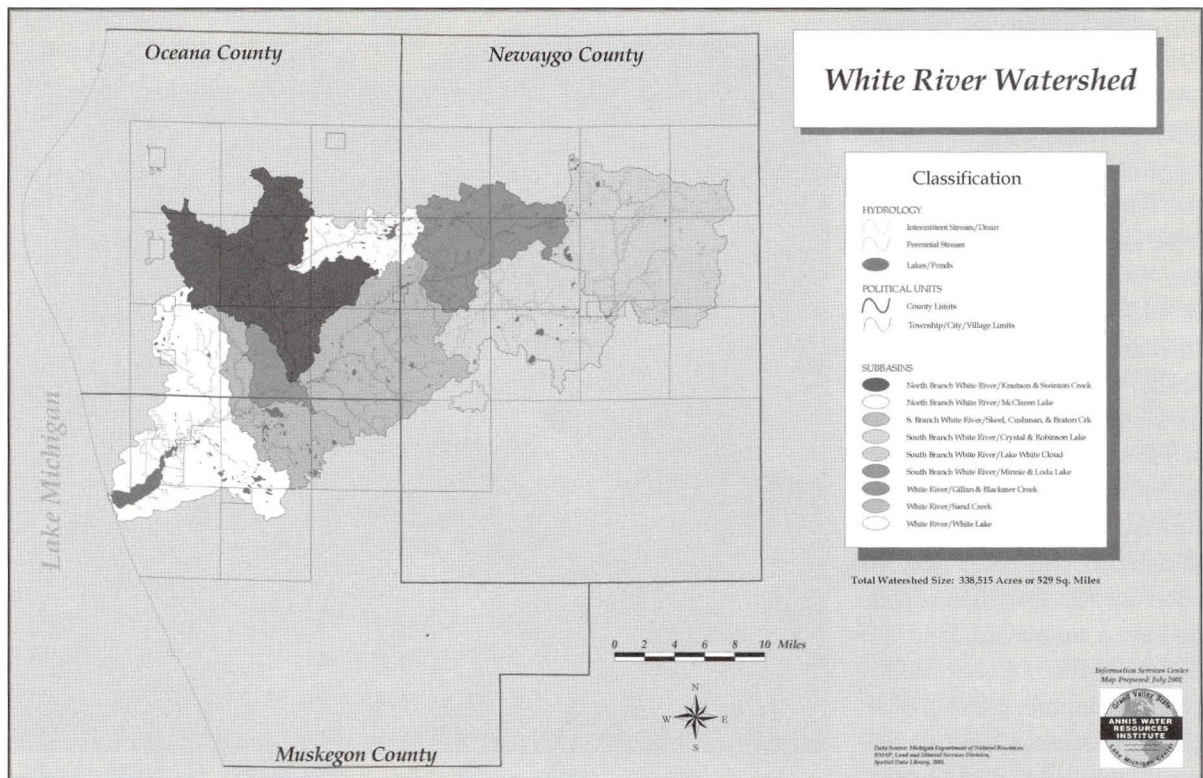
The objectives of this project are to conduct a preliminary assessment of the aquatic and terrestrial habitats present in the White River watershed and to identify areas of significant change. In addition, a series of benthic macroinvertebrate and water chemistry samples will be collected to further assess the nature of the aquatic habitat and water quality. Because of the size of the

project area, the aerial data and interpretations from the Michigan Resource Information System (MIRIS) will be used. This project will serve as an important "beginning" for the White River watershed in that it will develop a set of data that will identify areas of concern, inventory important natural features, and provide a technically sound basis for future environmental management plans and actions. In addition, the project will serve as an important tool for public education about the ecological importance of the White River watershed, and the significance of problem areas. Specific products from this project will include:

1. A habitat assessment report
2. A map atlas that documents current landuse and historical landcover changes

3. A pictorial CD-ROM of the key environmental data that can be used for public education.
4. A water quality assessment of White Lake using the research vessel *W.G. Jackson* that is conducted with local stakeholders.
5. An Index of Biological Integrity designed for the White River watershed that can be used for volunteer monitoring.

AWRI will be working with Michigan State University on the habitat assessment. In addition, outreach activities will be coordinated with ongoing projects by the Lake Michigan Federation and the Muskegon County Soil Conservation District to enhance public participation and K-12 education in the White River watershed.



# Stormwater Management Project

The Stormwater Management Project is moving full speed ahead into its second year. The project was funded by the Michigan Department of Environmental Quality in April 2000 and is a collaboration between the Kent County Drain Commissioner and AWRI to develop a coordinated, comprehensive stormwater management program in Kent County. This effort started with the formation of the Kent County Stormwater Management Task Force that includes representatives from area townships and municipalities, engineering and legal professionals, and environmental organizations.

For the past two and a half years, the Task Force has worked to develop a Model Stormwater Ordinance for Kent County. Both a Stormwater Atlas and a Stormwater Educational Handbook were developed to accompany the ordinance. These useful new tools will improve and strengthen the stormwater management skills of communities in Kent County.

To demonstrate the value of these tools, six Stormwater Sub-Regional Workshops for local decision-makers are scheduled from September through December 2001 throughout Kent County. Each Township/City/Village

was grouped based on sub-regional areas developed by Grand Valley Metro Council. The Council's sub-regional alliances are municipalities grouped together based upon a unique role or place in the metropolitan landscape.

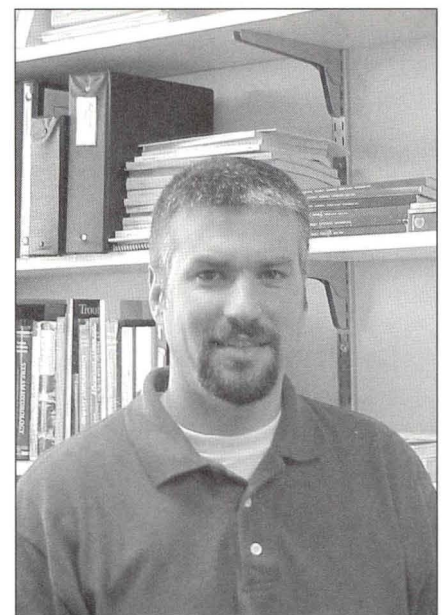
If you would like to know when a sub-regional workshop will be held in your area or would like more information about the project, contact Project Manager Nichol Stout at [stoutn@gvsu.edu](mailto:stoutn@gvsu.edu) or (616) 895-3092. The project web site is found at [www.gvsu.edu/wri/isc/stormwater/index.htm](http://www.gvsu.edu/wri/isc/stormwater/index.htm).

## Research Scientist Joins AWRI

The Annis Water Resources Institute welcomed Dr. Donald G. Uzarski to its staff as a Senior Research Scientist in July, 2001. Uzarski is a native of the Muskegon area and graduated from Mona Shores High School. Don is already familiar with Grand Valley State University, having received his bachelor's degree from GVSU. While he was a student, he worked for AWRI on the Grand River Watershed project. Uzarski went on to Central Michigan University to earn his master's degree in Aquatic Biology/Stream Ecology. He then went to Michigan State University where he earned his Ph. D. in Limnology/Stream Ecology. Following the completion of his Ph.D., he accepted a position as a Post-doctoral Research

Associate in Limnology/Wetland Ecology at MSU. He then accepted a position as a Visiting Assistant Professor at MSU. During the fall of 2000, he was also an Adjunct Professor at Grand Valley State University. He has taught courses in Limnology, Environmental Science, Stream Ecology, and Biomonitoring.

One of the many research projects Uzarski has been involved with is the development of indices of biotic integrity (IBI) for coastal wetlands of all five of the Great Lakes. Don has a joint appointment with the Biology Department at GVSU, where he teaches Limnology (the study of inland waters). Don's wife is currently completing a



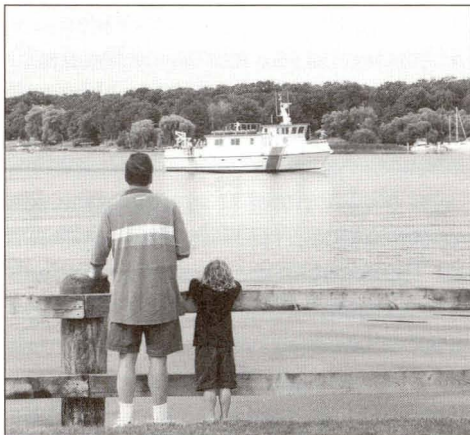
dual major Ph.D. at Michigan State University in Immunology and Environmental Toxicology, and has accepted a postdoctoral fellowship at the Van Andel Institute in Grand Rapids, where she will conduct breast cancer research.



# Making Lake Michigan Great 2001 Tour - A Success!

Over 1,300 people participated in the Making Lake Michigan Great Tour of the AWRI research vessel *W.G. Jackson* as it visited ports around the Lake Michigan basin this summer. Besides Muskegon,

displays from organizations involved with local water concerns including the White Lake Public Advisory Council, Lake Michigan Federation, White Lake Area Sports Fishing Association, and the Muskegon Conservation District.



White Lake, Michigan

ports of call included White Lake, Port of Indiana, Chicago, Sturgeon Bay, Menominee, and Escanaba. This is the fourth year of the tour, which is funded by U.S. Environmental Protection Agency and is a joint project of the AWRI and U.S. EPA Lake Michigan Forum.

Cruises and an open house on the *Jackson* vessel were part of the annual "Celebrate White Lake" event. Kathy Evans, a Lake Michigan Forum member, arranged this port of call. Miss Michigan, a native of the area, made an appearance. There were

The Port of Indiana stop was coordinated by Lee Botts and Christine Kirk of the Indiana Dunes Environmental Learning Center. The Junior Rangers Biodiversity Program, Mighty Acorns Nature Camp, Youth Conservation Corps, Michigan City teachers, and staff from the Indiana Dunes National Lakeshore all enjoyed cruises on the *Jackson*. The Port of Indiana sponsored a reception for local business leaders.



Menominee, Wisconsin

Shedd Aquarium was the host for the Chicago venue with Nicole Pierson as the contact person. The Young Naturalists from Shedd traveled on the *Jackson* from the Port of Indiana to Chicago. Teachers, the Chicago Park District, and the Shedd Aquarium staff were able to sample water near the Aquarium and in Lake Michigan. More than 300 people visited the *Jackson* during open houses.

The Door County Maritime Museum in Sturgeon Bay was the site of the Lake Michigan Forum meeting and eight cruises for the general public on the

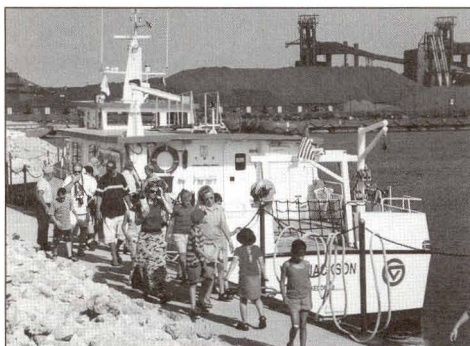


Sturgeon Bay, Wisconsin

*Jackson*. Roy Aiken, Door Property Owners and Forum member, arranged the events with the assistance of the Museum staff.

The Making Lake Michigan Great Tour made the front page of the Menominee area newspaper. Nancy Douglas, chair of the Menominee River Citizens Advisory Committee and a commissioner for the Michigan Natural Resources Commission, organized the logistics of this port.

Escanaba welcomed the *W.G. Jackson* to its new municipal marina. Karin VanDyke from the Mead Paper Division arranged cruises for community leaders and middle school students from Marquette. Dr. William Jackson, a graduate of Iron Mountain High School, was on hand to greet Dee



Port of Indiana, Indiana



Escanaba, Michigan

# Outreach Activities Reach Many

Since the dedication of the Lake Michigan Center (LMC) in June, numerous activities for students, teachers, and others have taken place. Events for students in the LMC classrooms have included an afternoon of water quality activities for the Bunker Hill Middle School LEAD 2005 students, a summer camp entitled "Tracking your Environment," and visits by classes. The *D.J. Angus* vessel was at the LMC for a trip by the Sciencetech group and science fair winners from Indiana.

With the tall ships as a backdrop, area teachers attended a workshop focusing on tall ships and the Great Lakes at the LMC. John Noling of the Muskegon Area Intermediate School District

planned the workshop. Nancy Richardson of the American Sail Training Association (ASTA) was one of the many speakers. The ASTA administrative staff utilized the AWRI facilities during their stay in Muskegon.

Two Global Learning to Benefit the Environment (GLOBE) trainings were held in summer 2001. One was hosted by Andrea Grix at the Kettunen Center in Tustin, Michigan. The other was in cooperation with the Regional Math and Science Center, Dart Foundation, and the Michigan Environmental Council. Dr. Irene Ladd of NASA taught teachers the new GLOBE ozone protocol as part of a project supported by the Michigan Space Grant Consortium. This

new cadre of GLOBE teachers will join those trained in the previous two years. According to a teacher from Muskegon, "I really enjoyed the course and am very excited about all of the possible ways we will use GLOBE in our science education."

The Michigan Geographic Alliance was at the LMC for training of their facilitators. The group boarded the *D.J. Angus* vessel in Grand Haven to study rivers, the theme of their workshop. Teachers from the National Association of Agricultural Educators and Michigan Association Agriscience Educators both took educational cruises on our outreach vessels this summer.

## 2001 Tour

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Benjamin, director of the Dickinson-Iron Area Mathematics and Science Center. At each port of call, guests were polled regarding their greatest concern about Lake Michigan. The top concern was water quality (pollution) followed by preservation, invasive species (particularly zebra mussels), and fisheries. Also mentioned were water diversions, drilling, and water levels. While most of the visitors were from Michigan, Indiana, Illinois and Wisconsin, people from at least 15 other states and 6 foreign countries boarded the vessel. In its four years, the tour has reached 26 ports of call in the Lake Michigan basin, and AWRI hopes to continue Making Lake Michigan Great next summer.

## Make A Splash With Project WET!

More than 50,000 school children gathered at sites across the country, to draw attention to the importance of water in our daily lives. The *Make A Splash With Project WET* festivals are the largest single-day water education events in the nation. This year the festivals were held on Friday, September 21.

In each state or province, the program is sponsored by a natural resource agency, university, or museum and is implemented by a Project WET Coordinator. The coordinators train facilitators, who in turn provide workshops for classroom teachers, agency educators, resource managers, and others. AWRI is the Project WET coordinator for Michigan. The Michigan festivals were held in Ionia County, the Detroit area, the Raven Hill Discovery Center in East Jordan, and at the Lake Michigan Center in Muskegon.

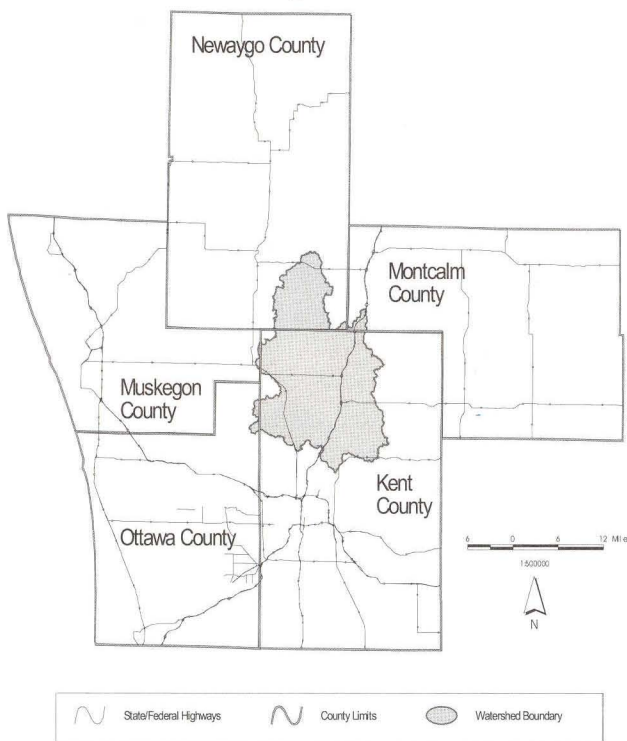
*Healthy Water, Healthy People* Water Quality Education Stations, sponsored by the Hach Company and The Perrier Group of America, were a key part of this year's *Make A Splash* festivals. They provided students with hands-on activities that demonstrate the importance of healthy water for healthy people and environments.

# Efforts In The Rogue River Watershed Continue

AWRI is currently working on two implementation projects in the Rogue River Watershed. The Michigan Department of Environmental Quality and the U.S. Environmental Protection Agency support these projects through funds from Section 319 of the Federal Clean Water Act and the Clean Michigan Initiative. These two implementation projects, an

ing 575 feet of stream bank, and restoring riparian vegetation along sections of the Rogue River. Through partnerships with the Kent County Road Commission, the Newaygo County Road Commission, and West Michigan Trout Unlimited, this project will protect cold water and warm water fisheries from degradation.

## Location of the Rogue River Watershed



Information/Education Program and Physical Improvements project, were a result of a two-year planning phase for the Rogue River Watershed. During the planning phase, a Rogue River Watershed Management Plan, a Rogue River Watershed Project Atlas, and other educational tools were produced.

To develop the management plan and map atlas, critical areas (parts of the watershed that are contributing a majority of pollutants and have the most significant impacts on the waterbody) were identified. Through this analysis, sediment and temperature were identified as known pollutants to the Rogue River Watershed. The Rogue River Watershed Physical Improvements project plans to control the source of these pollutants by repairing three road/stream crossings, stabiliz-

The Rogue River Watershed Information/Education Program complements the Physical Improvements project by promoting activities that will increase the involvement of the community in watershed protection activities through awareness, education, and action. The Grand Valley Metro Council, the Land Conservancy of West Michigan, the West Michigan Environmental Action Council, and West Michigan Trout Unlimited will assist the AWRI in hosting targeted workshops, organizing Stewardship Monitoring Days, conducting a watershed fair, and many other educational activities. Through this program, AWRI anticipates an increase in volunteer monitoring, the creation of vegetative buffers, reduced fertilizer usage, improved septic system maintenance, and more appropriate land use throughout the watershed.

If you would like more information about these projects please contact Project Manager Nichol Stout at [stoutn@gvsu.edu](mailto:stoutn@gvsu.edu) or (616) 895-3092. The project web page is found at [www.gvsu.edu/wri/isc/rogue/index.htm](http://www.gvsu.edu/wri/isc/rogue/index.htm).

## AWRI Unveils New Website – Check It Out!

The Annis Water Resources Institute has redesigned its website. Highlighted is our new home at the Lake Michigan Center. Also included is an introduction to AWRI staff, descriptions for existing projects, job opportunities, and announcements. The new site comes with a new address, [www.gvsu.edu/wri](http://www.gvsu.edu/wri).

# Kent County Septage Management Program

Each Kent County housing unit with a septic system is estimated to contribute 200 gallons of 'treated' sewage to the groundwater every day. Rural areas within the County are estimated to collectively discharge 6.9 million gallons per day (mgd) of processed wastewater. While municipal wastewater treatment plants continue to expand, expected population growth and the escalating cost of waste treatment services makes it impossible for local government to meet the projected demand. This remains true even though evidence suggests that water quality impacts resulting from individual on-site septic system use are likely to get worse as rural areas in Kent County continue to grow at an accelerated pace.

Another problem associated with septic system use is the eventual disposal of septage waste. Septage waste is that material pumped from a septic tank as part of regular maintenance of a septic system. This material is generally disposed of on abandoned fields or agricultural land. This can cause problems depending upon the time of year the septage is applied, whether it is properly incorporated into the soil, and the location of groundwater levels and nearby streams. One alternative to land application of septage is treatment at conventional sewage treatment plants. In some instances, such as in the case of the City of Wyoming, Michigan, a separate facility is created for the specific purpose of treating septage waste.

The Metropolitan Water and Sewer Planning Agency (MWSPA), an advisory group to the Grand Valley Metro Coun-

cil, has as its members those communities that provide sewage and water service and also their customer communities. They have witnessed the growing problems associated with increasing septic system use and the inevitable need for septage disposal. As a result, the MWSPA decided to make the issue a priority. Working with AWRI and the Michigan Department of Environmental Quality, the MWSPA applied for and received a Section 319 Planning Grant to develop a Septage Management Program for Kent County.

The goal of the *Kent County Septage Management Program* is to limit septic system use and septage disposal to those areas where it is appropriate, upgrade maintenance procedures throughout Kent County, and encourage septic system alternatives where such alternatives prove economical and technically sufficient.

The approach taken to achieve this goal is two-fold. First, the project will allow the development of a detailed *Septage Management Plan* that will include al-

ternative treatment and disposal technologies as well as recommendations for institutional mechanisms intended to coordinate maintenance and disposal programs on a county wide and regional scale. Central to the development of this *Plan* is the creation of a Model Septage Ordinance to be adopted by rural townships throughout Kent County. The second approach necessary to achieve the goal, and key to the acceptance of the Model Septage Ordinance and the implementation of the *Plan*, is the creation of a comprehensive and effective Public Information and Education Program.

This one-year \$98,242 project began officially in June 2001. Partners in this endeavor include the nationally known public information and education consultant Tetra Tech, Inc., and a local expert in small community sewage treatment systems, Prein & Newhof. For more information about this particular project contact John K. Koches, Senior Program Manager, Information Services Center at [kochesj@gvsu.edu](mailto:kochesj@gvsu.edu) or (616) 895-3792.

