4-1996

Water Resources Review - April 1996 Vol 9 No 1

Annis Water Resources Institute

GVSU WATER RESOURCES INSTITUTE

WATER RESOURCES

Review

Grand Valley State University • Water Resources Institute • April 1996 • Volume 9, Number 1

In this Issue...

W. G. Jackson Begins To Take Shape

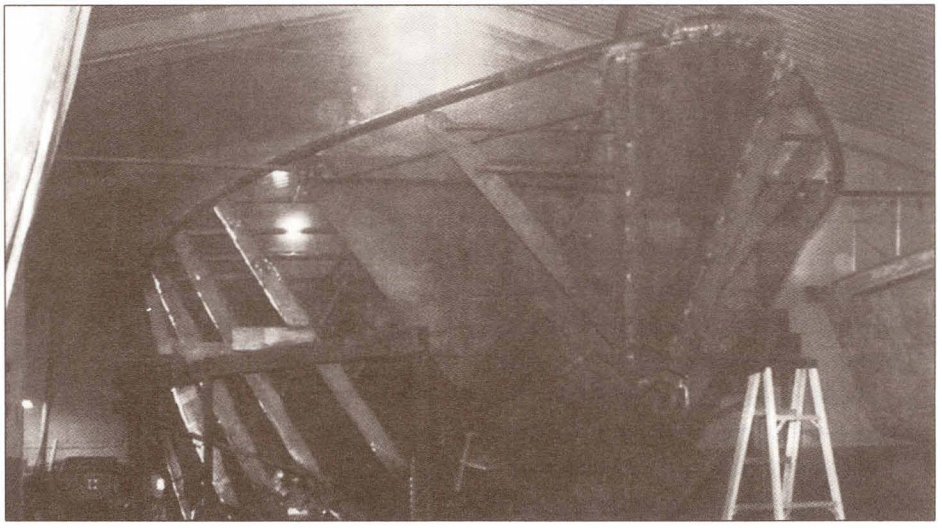
Construction Of GVSU's Second Research And Education Vessel Well Underway

Blueprints and design sketches are being replaced with cold gray steel as Grand Valley State University's second research and education vessel, the *W. G. Jackson,* begins to take form at Kanter Yachts in St. Thomas, Ontario. Work is well underway on the new 65 foot vessel. Dr. Ronald Ward, Director of the Water Resources Institute, recently visited the construction site in St. Thomas and reports that the steel hull is nearly complete and work has begun on the research deck and pilothouse.

Kanter Yachts is located approximately 20 miles inland from Port Stanley, where the boat will be launched. The boat builder is planning to transport the vessel's hull and pilothouse to the launch site as two separate pieces, with final assembly taking place at Port Stanley.

Once assembled, the *W. G. Jackson* will have 400 square feet of deck area and a top speed of 12 knots. Along with its laboratory, the vessel will have sleeping quarters for its crew, two heads, and a galley. Powered by two 500 horsepower diesel engines that were donated by Detroit Diesel, the *W. G. Jackson*

continued on page 6



The hull of the W. G. Jackson *takes shape at Kanter Yachts in St. Thomas, Ontario.*

Printed on recycled paper with soy ink

WRI Assists White And Muskegon Lake PAC's

The Water Resources Institute's Information Service Center (WRI-ISC) is currently preparing a Decision Support System (DSS) for the immediate drainage area surrounding White and Muskegon Lakes. The DSS includes digital information and a series of map products describing a variety of natural features in the White Lake and Muskegon Lake Areas Of Concern (AOCs).

The detailed information includes land use analysis, soil types, a population census, as well as an aquatic plant and wildlife habitat assessment. Consultants have been hired by the Muskegon County Soil Conservation District (MCSCD) for the plant and wildlife assessments. Dr. Mark Luttenton of the GVSU Biology Department is assessing the aquatic plants for both lakes. The Muskegon Lake wildlife habitat assessment is being prepared by Bob Day, of Day and Associates Environmental Planners, while wildlife biologist Tom Nederveld is assessing the habitat for White Lake.

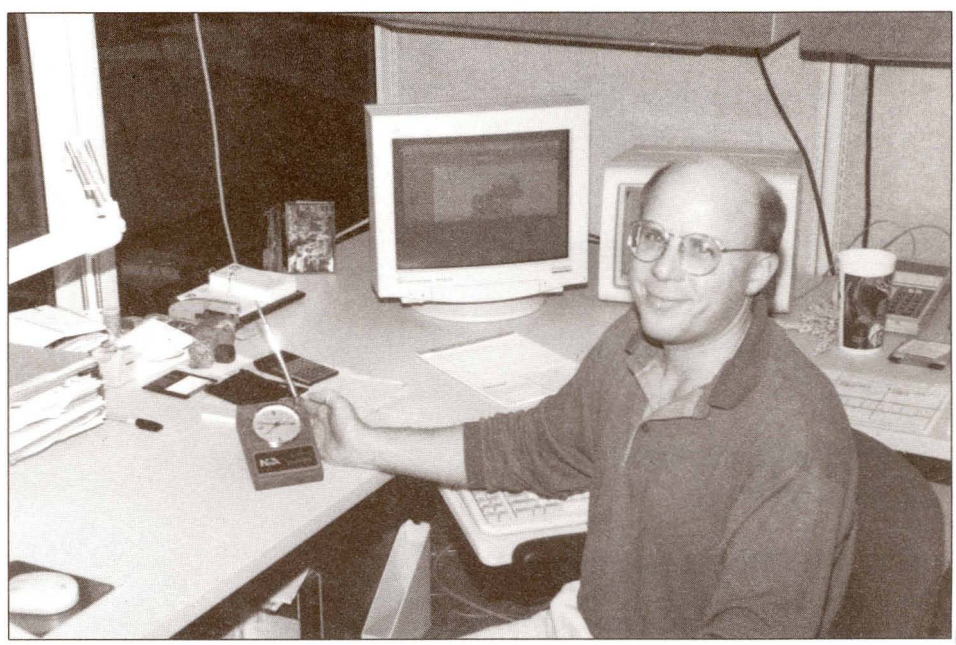
Once compiled, the information will be placed into a DSS that will assist the Public Advisory Council (PACs) groups as well as local governments and area planners in making sound environmental decisions that will lead to better water quality in both White and Muskegon Lakes.

The project was funded by the Muskegon Lake/White Lake Remedial Action Plan Implementation and Public Advisory Council Support Grant received by the MCSCD.

Information about the map products or the development of the DSS for both PAC's may be obtained by contacting WRI Research Assistant Kurt Thompson at (616) 895-3091 or at *thompsonk@gvsu.edu*. For information on the White Lake or Muskegon Lake PACs, contact District Conservationist Greg Mund or Project Coordinator Theresa Lauber at the MCSCD office at (616) 773-0008.

Award Given To WRI Research Assistant

WRI Research Assistant Kurt Thompson was presented with the *Good Neighbor Award* by the USDA Forest Service (Northeastern Area, State and Private Forestry) for his work with the 1995 Cooperative Gypsy Moth Suppression Project in Michigan. The award is given in recognition of special services or a cooperative relationship that promotes the implementation of new technologies. Kurt's assistance in providing geographic information system (GIS) and global positioning system (GPS) information to USDA personnel in several Michigan counties maximized the number of acres (approx. 80,000) treated for Gypsy Moth infestations and the accurate delivery of the bacterial spraying agent to infested areas by aerial applicators.



WRI Research Assistant Kurt Thompson

WRI And MichCon Put Greenville's Infrastructure On The Map

The Water Resources Institute has provided the City of Greenville with a new Infrastructure Decision Support System (DSS) to aid in the city's future planning. Funded by a grant from Michigan Consolidated Gas Company, the WRI Information Service Center (ISC) created an extensive DSS that includes digital information on natural gas distribution; electric, telephone, and television cable services; and municipal water and sewer distribution systems, including stormwater collection.

The Decision Support System for the City of Greenville was built by WRI Research Assistant Rod Denning and Research Technician Christy Klinge.

The DSS consists of a number of digital map overlays that describe the type and extent of services throughout the city. In addition to utility information, a digital layer depicting sites of environmental contamination within the city was developed based on information from the Michigan Department of Natural Resources. George Bosanic, Greenville's City Manager, plans to use the DSS to assist with current planning projects and future city expansion plans.

For additional information about Decision Support Systems created by the Institute, contact WRI Research Assistant Rod Denning or Research Technician Christy Klinge at (616) 895-3793 or *denningr@gvsu.edu*.

Sustainable Development Conference Scheduled For June 13

The 3rd Annual Sustainable Development Conference will take place on June 13 from 1 - 8 p.m. at the Holiday Inn Crowne Plaza in Grand Rapids. The conference, funded in part by the Frey Foundation, focuses on local urban growth issues and various management methods for both urban and rural communities. The Water Resources Institute will co-sponsor the event with the West Michigan Environmental Action Council, Natural Area Conservancy Of West Michigan, the Greater Grand Rapids Builders Association, the Grand Valley Metropolitan Council, and several area consulting firms. For more information, contact Research Assistant Amy Toering at (616) 895-3749 or *toeringa@gvsu.edu*.

Padnos Open House Planned For April 13

You are cordially invited to attend an open house on April 13, 1996 to celebrate the dedication of the new Padnos Hall of Science. The event will be open to the public from 9:00 a.m. to 4:00 p.m. with exhibits and demonstrations by various departments within the Science and Mathematics Division at Grand Valley State University, including the Water Resources Institute. Open house activities will be offered for the whole family to experience and enjoy. For additional information contact the Science and Mathematics Division Dean's Office at (616) 895-2261.

WRI Business-Industry Outreach Continues

Although the U.S. EPA grant for pollution prevention has ended, WRI is continuing to help coordinate and sponsor environmental events in west Michigan. The 3rd Annual Hazardous Waste Workshop with GVSU alumnus Dale DeKraker of the Michigan Department of Environmental Quality (DEQ) attracted over 125 participants. A notebook of materials on hazardous waste regulations was prepared for the attendees.

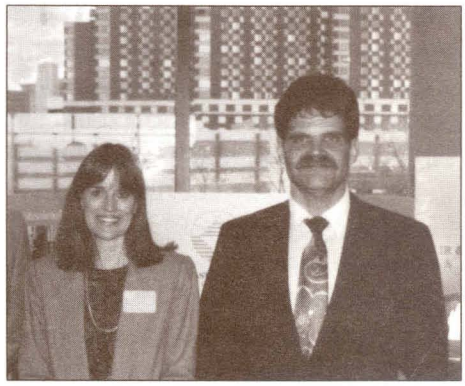
In her capacity as secretary of the West Michigan Chapter of the Air & Waste Management Association (A&WMA), WRI Research Associate Janet Vail has been assisting A&WMA with environmental conferences and providing input for a regional newsletter. She serves as the national committee chair for the A&WMA Elementary and Secondary Education Committee and has been active in presenting teacher workshops on environmental topics.

WRI is the Michigan representative on the steering committee of the Great Lakes Regional Pollution Prevention Roundtable. This group pulls together government and other pollution prevention technical assistance providers from throughout the Great Lakes states and the province of Ontario. The Institute is also active on the State of Michigan Retired Engineers Technical Assistance Program (ReTAP) advisory committee. ReTAP provides free on-site waste assessments. ReTAP is managed by the DEQ Environmental Assistance Division that assists business and industry with environmental issues via an information hotline (1-800-662-9278).

Local Pollution Prevention Efforts

At the local level, the Muskegon Ottawa Pollution Prevention Alliance continues under the leadership of Jim Gillespie of Herman Miller Corporation and Bob Pleasant of ESCO with support from WRI. GVSU-WRI is active on the executive board of the Business & Industry Team for the Environment (B.I.T.E.) and the Grand Rapids Area Chamber of Commerce Environmental Affairs Committee. GVSU students have started an Environmental Management Association and are looking to business and industry to provide a "real world" perspective.

Water quality issues were the topic of a teleconference co-sponsored by WRI, the America Bar Association, the Water Environment Federation, and the law firm of Varnum, Riddering, Schmidt & Howlett. The speakers highlighted the importance of watersheds as planning units.



Dale DeKraker of the Michigan Department of Environmental Quality and Janet Vail of WRI.

Air Permit Technical Manual Update

WRI's interest in air quality issues continues as its 500+ page air permit technical manual is being updated. Funding for the updates has been provided by industry for two years. WRI is co-sponsoring the upcoming air permit training sessions by the DEQ Environmental Assistance Division and is active in the tri-county *Ozone Action Day* program which is being managed by the Grand Valley Metro Council. For more information on WRI business-industry-environment connections, contact WRI Research Associate Janet Vail at (616) 895-3048 or *vailj@gvsu.edu.*

WRI Will Host The Lake Michigan Forum

In August, WRI will host the Lake Michigan Forum which helps to implement the U.S. Environmental Protection Agency's Lakewide Management Plan for Lake Michigan. The meeting will focus attention on the Grand River Watershed and the Muskegon Lake, White Lake, and Kalamazoo River Remedial Action Plans. This group will have an opportunity to tour the area on Grand Valley's research and education vessels *D. J. Angus* and *W. G. Jackson*. For more information contact WRI Research Associate Janet Vail at (616) 895-3048 or *vailj@gvsu.edu.*

New Methods Of Groundwater Treatment Tested By WRI And DEQ

A method to treat a contaminated groundwater site in Lakeview, Michigan is currently being developed by the Michigan Department of Environmental Quality (DEQ) and Dr. Richard Rediske, Manager of WRI's *Robert B. Annis Analytical Laboratories*. The herbicide Dinoseb was discovered in groundwater under the Lakeview Airport which serves as a base for aerial pesticide applications in the region. The presence of Dinoseb is of particular concern because of its toxicity and chemical properties that cause it to spread easily in the local groundwater. In addition to Dinoseb, Dr. Rediske was able to identify several other herbicides in groundwater samples including atrazine, metolachlor, alachlor, and metributzin. An initial remediation plan, developed by the DEQ, had an estimated cost of $1.5 million.

In an attempt to lower the cost of groundwater clean-up, the DEQ and WRI conducted a pilot study which involved exposing contaminated groundwater samples to sunlight for a three month period. The results indicated that sunlight was able to degrade the Dinoseb over the 90 day period. In addition to their findings, Dr. Rediske was able to develop an inexpensive method of analysis to measure Dinoseb concentrations during the three month pilot study.

Based on the success of the pilot study, a laboratory study was conducted to evaluate practical methods to speed up the degradation process. The initial results found that by introducing hydrogen peroxide and iron, a method known as Fenton's Reaction, the time required to degrade the herbicide could be decreased. A second set of lab experiments is planned to optimize Fenton's Reaction to achieve Dinoseb degradation in less than one week.

If the results of WRI's 1996 experiments are favorable, DEQ will consider construction of a lagoon system which utilizes natural sunlight and hydrogen peroxide for groundwater treatment. The cost for this method of groundwater remediation is estimated at approximately $400,000, four times less than original cost estimates.

Persons interested in this project or other activities at the *Robert B. Annis Analytical Laboratories* may contact Dr. Rediske at (616) 895-3047 or *redisker@gvsu.edu*.

PCB Research Results To Be Published

Dr. Min Qi, Research Associate at the Water Resources Institute, and two of her student assistants have written a portion of the latest volume of the American Chemical Society (ACS) Symposium Series entitled *Environmental Biomonitoring and Specimen Banking*. A chapter entitled *Distribution of PCB Congeners in Bear Lake Sediment* relates the findings of an investigation of polychlorinated biphenyls, or PCBs, in bottom sediments of Bear Lake in Muskegon County, Michigan. WRI student assistants and GVSU chemistry majors Jennifer Carson and Sara Meyer are co-authors with Dr. Qi. The ASC volume is to be published in late March.

As reported in the February 1995 issue of the *Review*, PCB's were once used in numerous products such as liquid insulators for electrical capacitors and transformers, inks, and plastics. Identified in the late 1960's as possible carcinogens and linked to numerous genetic defects in animals, PCB's continue to plague the environment. Dr. Qi's work has centered on isolating some of the most persistent PCB components that continue to contaminate lake bottom sediments.

One key finding of the research was that contamination levels were homogeneous throughout the Lake, suggesting that PCB's are probably entering the system through atmospheric deposition. Also, the greatest amount of PCB was found at a sediment depth of 15 - 25 centimeters and steadily decreased in concentration with increasing sediment depths below 25 centimeters.

In addition to the work on Bear Lake sediments, Dr. Qi also analyzed filets from several species of fish from the lake for PCB contamination. The results of this portion of the project are expected to be published soon. For additional information about WRI's PCB research, contact Dr. Min Qi at (616) 895-2731 or *qim@gvsu.edu*.

WRI Joins Information Super Highway

Information about publications, updates on recent activities at the Water Resources Institute (WRI), or information about Grand Valley's research and education vessels is now available through the Institute's homepage on the Internet. The Information Service Center, the Waste Reduction and Management Program, and the *Robert B. Annis* Analytical Laboratories are also "on line", including direct email links to staff members at the Institute.

The Institute anticipates adding additional information links to the Bear Creek and York Creek Watershed Projects and an *Important Announcements* page concerning upcoming WRI workshops, seminars, and other events. Access to the Internet will allow for a greater exchange of information between the Institute and other researchers or educational facilities with an interest in land use, pollution prevention, or water quality.

Access to WRI's homepage can be made through Grand Valley State University's web site at *http://www.gvsu.edu*. Questions, comments, or suggestions concerning WRI's homepage should be directed to Jeff Cooper at (616) 895-3271 or *cooperjc@gvsu.edu*.

New Publications Available

The following publications are now available at the Water Resources Institute.

Second Annual Report For The Bear Creek Restoration Project - Project Year 1993-1994 (WRI Publication #MR-96-2).

An Assessment Of Water Quality And Aquatic Habitat, And Recommendations For The Protection And Enhancement Of The Sand Creek Watershed - Ottawa County And Kent County, Michigan (WRI Publication #MR 96-1).

An Assessment Of Water Quality And Nutrient Transport Including Recommendations For The Lower Grand River And Selected Tributaries (WRI Publication #MR-96-3).

For information or copies of these or other publications, contact the Institute at (616) 895-3749.

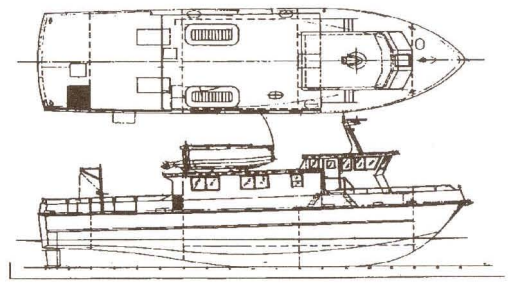
W. G. Jackson

continued from page 1

will be able to operate for extended periods of time on the Great Lakes without the need to return to port.

The *Jackson* is expected to arrive in Muskegon in June. She will be docked along the downtown shoreline at the West Michigan Dock and Market Corporation. The vessel is expected to enhance the educational activity in the Muskegon area, offering aquatic science training and experience to local and regional educational facilities.

Scheduling information for the *Jackson* will be announced later this summer. For additional information about either of GVSU's research and education vessels or WRI's Water Resources Outreach Education Program, contact the Institute at (616) 895-3749.

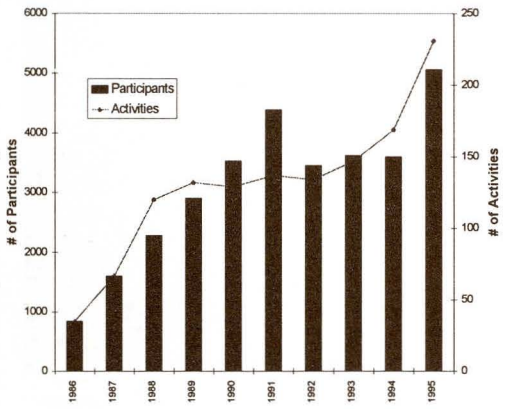


D. J. Angus Has Record Season During 1995

Number Of Participants Increased Nearly 30% Over 1994

A record number students and community groups took part in the WRI's Water Resources Outreach Education Program aboard the *D. J. Angus* during the 1995 boating season. Five-thousand, sixty three individuals participated in 231 events to measure water clarity, determine concentrations of dissolved oxygen, and perform other tests to evaluate water quality. Evening and Saturday cruises were responsible for accommodating the record number of events.

The increasing demand for the services of the *D. J. Angus* underscores the need for a second vessel, the *W. G. Jackson*, now under construction in St. Thomas, Ontario. The *W. G. Jackson* is expected to begin operations from her home port of Muskegon, Michigan in June 1996.



Since 1986, the Water Resources Outreach Education Program aboard the D. J. Angus ***has increased nearly six fold, operating at full capacity during much of the season.***

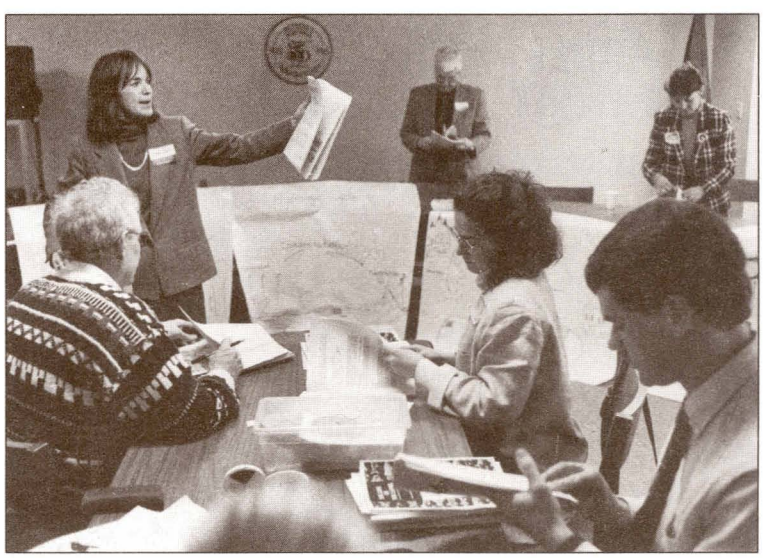
Scheduling for the 1996 operations of the *D. J. Angus* are nearly complete. Scheduling for the *W. G. Jackson* will not officially begin until mid-summer of 1996.

For more information please contact Stephanie Tuttle at the Water Resources Institute, (616) 895-3749 or tuttles@gvsu.edu.

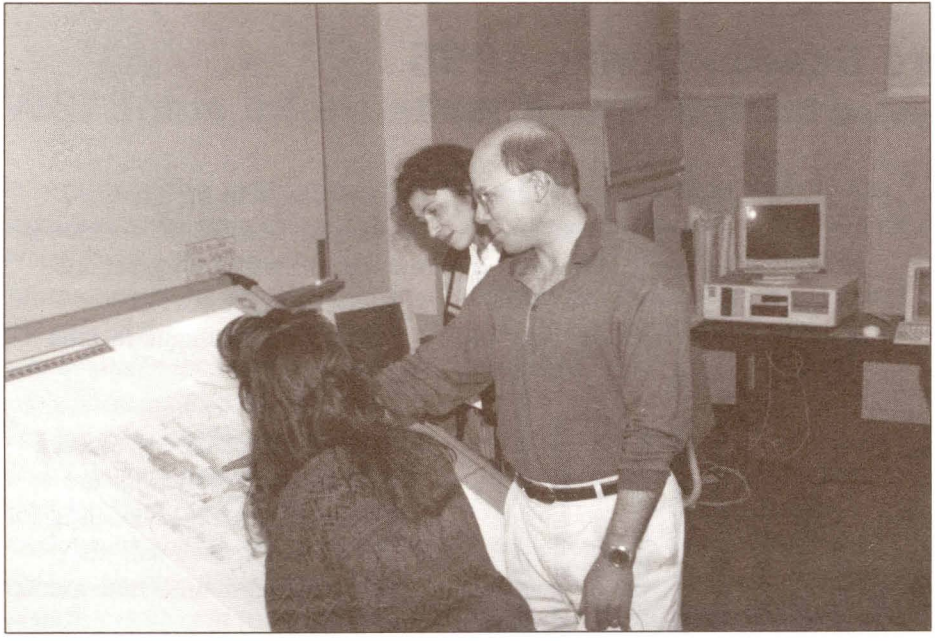
WRI Hosts Water Education Workshops

Two workshops, designed to assist science teachers in Emmet County, Michigan, were recently held in Petoskey by WRI Research Associate Janet Vail and Chuck Vanderlaan, Science Instructor on the research vessel *D. J. Angus*. The water education workshops for Petoskey and Littlefield school teachers were funded by a grant from the Petoskey - Harbor Springs Area Community Foundation and intended to serve as an educational assist in math and science. An additional workshop will be held this Spring for the Harbor Springs School District. The workshops will be followed by a visit to the Little Traverse Bay area by Grand Valley State University's new research vessel, the *W. G. Jackson,* which is expected to begin operations this summer.

For information on water education workshops by the Water Resources Institute, contact Janet Vail at (616) 895-3048 or at *vailj@gvsu.edu*.



WRI Research Associate Janet Vail (standing left) leads Petoskey and Littlefield school teachers through a water education workshop. The workshop was funded by the Petoskey-Harbor Springs Area Community Foundation (photo by the Petoskey News Review).



Christy Klinge (seated), Kurt Thompson (center), and Diane Guillard of the Water Resources Institute (WRI) work on digitizing geographical areas to be treated for Gypsy Moth infestation this spring. On January 31, the WRI Information Service Center (ISC) held a Gypsy Moth, GIS workshop where over 20 participants including Ron Priest, Michigan's Gypsy Moth Program Manager, five MDA Regional Supervisors, and Gypsy Moth coordinators from 10 Michigan counties gathered to learn GIS fundamentals as they apply to the Gypsy Moth Suppression Program in Michigan.

The ISC is currently working to digitize approximately 70,000 acres in 11 counties. Aerial applicators will use this GIS information to greatly increase the efficiency of their spray applications as they target Gypsy Moth infestations in Michigan.

WATER RESOURCES
Review

Jeff Cooper, Editor
Stephanie Tuttle, Publishing Coordinator
Dr. Ronald Ward, Director

Contributing Authors: Jeff Cooper
Christy Klinge
Rick Rediske
Kurt Thompson
Janet Vail

Water Resources Review is a publication of the Water Resources Institute, Grand Valley State University. For further information write:

WATER RESOURCES REVIEW
Water Resources Institute
Grand Valley State University
One Campus Drive
Allendale, MI 49401

phone: (616) 895-3749
fax: (616) 895-3864