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Water Resources Review - October 1994 Vol 7 No 3

Annis Water Resources Institute

GVSU WATER RESOURCES INSTITUTE

WATER RESOURCES

Review

Grand Valley State University • Water Resources Institute • October 1994 • Volume 7, Number 3

In this Issue...

GVSU To Add Second Research Vessel

Major Financial Boost Launches Fundraising Campaign

The Water Resources Institute's (WRI) plan for a second research vessel is moving forward with the announcement of a private gift and a State of Michigan grant to help get the boat off the drawing board and into the water. A $250,000 donation by Dr. William G. Jackson and a Michigan grant of equal value have provided a major boost to a fundraising campaign now underway.

The new vessel will be christened the **W. G. JACKSON** in honor of west Michigan environmentalist Dr. William Jackson. The boat will be based on Muskegon Lake and will carry on the same water research and educational missions as the Grand Haven based **D. J. ANGUS**. When finished, the boat and related programs will provide science education to about 3,500 K-12 and college students and adults each year.

Dr. Jackson, a former Upjohn Company chemist and a founding partner of the Burdick and Jackson Company, has been active in water-related environmental causes for many years. He was a founding member of the *Save Our Lake Committee*, which was responsible for helping to clean up Muskegon Lake. "Bill Jackson was

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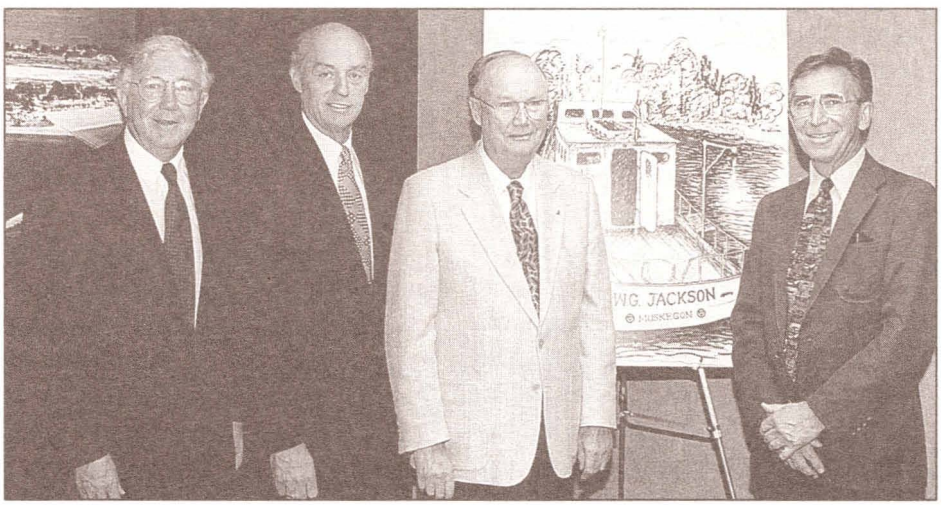

Standing next to an artist's rendition of the new Muskegon based research vessel, the W. G. JACKSON, are (left) GVSU President Arend D. Lubbers, Representative Leon Stille, Dr. William Jackson, and fundraising campaign co-chairman Dr. William Schroeder, Jr. of Trace Analytical Laboratories.

Printed on Recycled Paper with Soy Ink

Groundwater At Migrant Labor Camps Analyzed

The Water Resources Institute (WRI) has been looking into the possible pesticide contamination of groundwater supplies in specific agricultural areas of Ottawa County. In cooperation with the Ottawa County Community Action Agency (OCCAA), WRI has recently investigated the groundwater quality at several migrant labor camps located throughout Ottawa County.

Wells that provide drinking water to migrant communities are sometimes screened to determine the presence of nitrates and other indicators of contamination. Although these camps are located in close proximity to fields where pesticides are being applied, it is not a common practice to test their water supply for pesticide contamination. WRI agreed to assist the OCCAA in their evaluation.

There are approximately 60 migrant labor camps in operation throughout Ottawa County. They are divided between essentially three crop types: blueberries, apples, and nursery crops. Although some of the 60 camps are supplied with water from a municipal source, most rely on individual well systems.

WRI's first task was to rank each site by its susceptibility to pesticide contamination. To do this, the Institute devised an analytic model using its Groundwater Data Base containing more than 2,400 Ottawa County domestic wells. The ranking of migrant labor camps was based in part on the number of people served by individual well systems, the kind of crop grown, the pesticides used, and the soil type prevalent in the camp area.

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Research Vessel Campaign Off To Good Start

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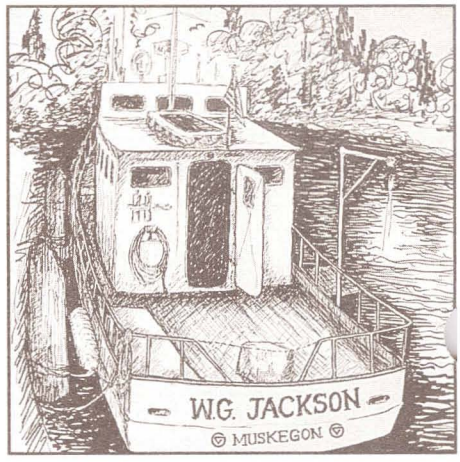
helping to protect the environment, especially in Muskegon, long before it became fashionable," said Dr. William Schroeder, Jr. of Trace Analytical Laboratories. Dr. Schroeder co-chairs the fundraising campaign with Roger A. Andersen of Peninsular Investment Co.

The state grant from the Commerce Department's University Business Research Development Fund was announced by Michigan Rep. Leon Stille of Ferrysburg. "What we have here is the best kind of partnership between the private and public sectors. This project is so important for Muskegon, and the environmental benefits of this research vessel will help all of west Michigan" Stille said.

The Grand Valley University Foundation will use the Jackson gift and the state grant to kick-off the campaign to raise the estimated $1.6 million needed to fund the project. The campaign will be conducted in partnership with the Muskegon County Community Foundation, which is accepting gifts for a permanent endowment to help support the project. For more information about the Muskegon vessel campaign, contact Joyce Hecht, Campaign Director, or Todd Buchta, Assistant Campaign Director, at the Grand Valley University Foundation in Grand Rapids (616) 771-6530.



Dr. Chren Receives Grant Under Project JOVE

Dr. William Chren, Associate Professor, School of Engineering, received a $20,000 grant from the National Aeronautics and Space Administration (NASA) under *Project JOVE* to continue his research in the area of satellite communications. The research is designed to help NASA determine the speed and efficiency with which satellites can process large packets or bursts of information. Dr. Chren is currently in his fourth year of support under *Project JOVE*, a program administered by the Water Resources Institute.

WRI Prepares Guide To Assist Businesses

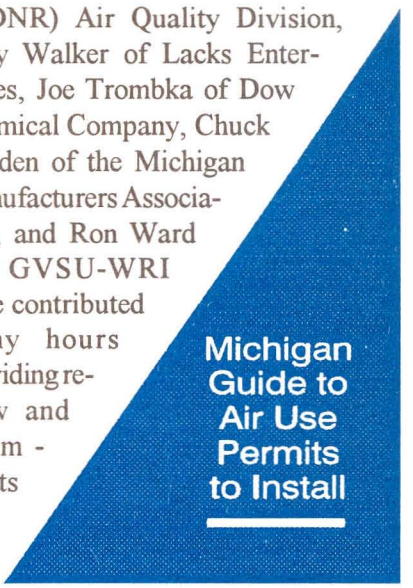
A booklet entitled the *Michigan Guide to Air Use Permits to Install* has just been published and is available for public dissemination. This document, produced by the Grand Valley State University Water Resources Institute (GVSU-WRI), focuses mainly on the Michigan permit to install for new or modified sources of air contaminants. The purpose of the guide is to provide a more detailed narrative than has been previously available on air permits. Topics in the guide include how to determine if an air permit is needed, what is involved in a permit to install application, how a permit to install gets issued, and how to comply with a permit to install.

Copies of the *Michigan Guide to Air Use Permits to Install* are available from the Small Business Clean Air Act Assistance Program, the MDNR Air Quality Division, and GVSU-WRI. Organizations such as the Michigan Manufacturers Association can also be contacted about the guide.

A conference entitled *Clearing the Air in West Michigan* was held on September 22, 1994 in Grand Rapids to discuss air quality issues. Those attending the conference, sponsored by the law firm of Varnum, Riddering, Schmidt & Howlett and GVSU-WRI, received copies of the new guide. The guide is also being disseminated at meetings and activities of the Air & Waste Management Association.

GVSU-WRI is also working on a more comprehensive manual on air issues. With the revisions to the air quality rules pending final action, sections of this manual will be issued as monographs instead of as a complete document. These modules will be in loose-leaf format to facilitate updating, and they should be available starting this fall.

A steering committee consisting of Dennis Armbruster of the Michigan Department of Natural Resources (MDNR) Air Quality Division, Gary Walker of Lacks Enterprises, Joe Trombka of Dow Chemical Company, Chuck Hadden of the Michigan Manufacturers Association, and Ron Ward of GVSU-WRI have contributed many hours providing review and comments for this project. The material has been peer reviewed by consultants, the MDNR, industries, and trade organizations. Contact Janet Vail at (616) 895-3048 for further details on the air use permit guidance document project.



D. J. ANGUS Receives NSF Grant

The Water Resources Institute (WRI) has been awarded a $37,000 grant by the National Science Foundation (NSF) to provide new equipment aboard Grand Valley State University's research vessel D. J. ANGUS. The grant will improve science education on board the D. J. ANGUS by providing new analytical equipment and GPS capabilities on the vessel. By the end of the 1994 season the D. J. ANGUS will have participated in more than 1,050 different educational events involving over 26,500 students, teachers, and concerned citizens in hands-on training in basic water quality testing and water resource education.

Anyone who is interested in scheduling an event aboard the D. J. ANGUS for the 1995 season should contact Tonya Cnossen of WRI at (616) 895-3749. Reservations should be made soon as next year's schedule is rapidly filling.

Assessments Of Sub-Watersheds To Assist In Local Planning Efforts

The Water Resources Institute (WRI) has undertaken an extensive assessment of a number of sub-watersheds in the Grand River watershed. Six tributaries of the Rogue River in the northern portion of Kent County and one stream spanning Kent and Ottawa Counties have undergone biological surveys integrated with land use information, population demographics, and groundwater records. The information will provide a comprehensive report that details the water quality within each stream and how land use is affecting water quality within the watershed.

This sub-watershed initiative is part of the Grand River Watershed Project (GRWP) funded by The Grand Rapids Foundation. It is designed to determine existing water quality as represented by the types and numbers of fish, macroinvertebrates, and habitat found along the stream. Combined with the biological survey are assessments of land use within the watershed as well as population demographics. This information demonstrates how land use is changing with population growth and how these changes may affect water quality within the watershed. Previous land use studies or biological surveys by agencies such as the Michigan Department of Natural Resources (MDNR) are also being incorporated to indicate any change in a watershed over time.

Student Research Assistant Brian Keeley conducts a fish shocking exercise in a tributary of the Grand River.

Groundwater information, when available, is being incorporated to reflect the quantity and quality of groundwater entering a stream. Sandy soil types along some of the area streams allow for rapid drainage of the land and increased rates of groundwater entering the stream. These streams seem to reflect higher populations of Brook and Brown Trout and macroinvertebrates found in cold, high quality streams. Heavy soils have reduced rates of filtration resulting in greater volumes of surface drainage or runoff. Surface drainage does not benefit from the filtering and cooling properties of the soils. As a result, larger volumes of sediment and surface contaminants are delivered in runoff to the stream reducing water quality.

This effort by WRI is a major advance in our knowledge of the region's natural resources in that every aspect within the watershed is being integrated into one document to reflect a more complete assessment of water quality. This integration has enabled WRI staff to compose management recommendations for the entire watershed as opposed to the stream and its banks only. It is important that we realize a stream is a reflection of the land within the watershed. The types of soils, agricultural practices, and population distributions all have a direct effect on water quality as we know it. Therefore, a water quality study and its conclusions must incorporate all aspects of the watershed.

The Kent County streams that are currently being assessed include Stegman, Shaw, Rum, Cedar, and Becker Creeks in the Rogue River Watershed, as well as a section of the Rogue River itself. The Sand Creek Watershed, located in both Ottawa and Kent County is also being assessed and reported on.

The final product of this effort will be a comprehensive report giving land use planners another tool to make better decisions regarding the course of future development and the best available background material to serve as a guide for best management practices along the stream itself.

To request information about the GRWP's sub-watershed initiative contact John Koches, Patti Fisher, or Jeff Cooper at (616) 895-3271.

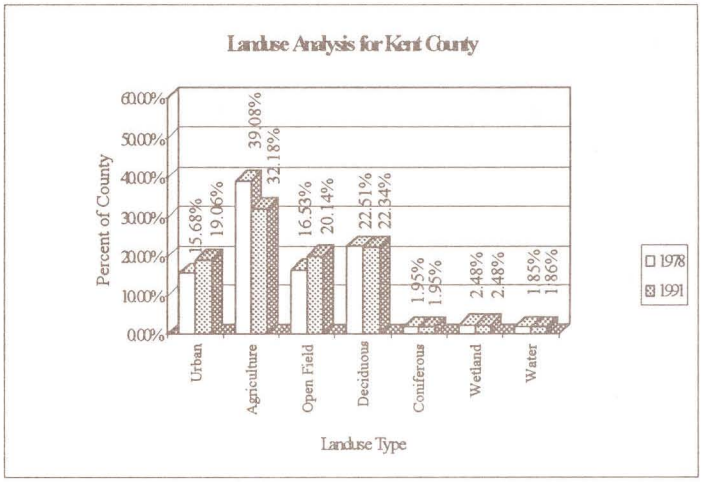
2020 Project Determines Land Use Change In Kent County

As our cities and urban centers continue to grow and expand at an ever accelerating rate, each of us begins to sense a loss of open space. To what extent is our perception real? The Water Resources Institute (WRI) is considering this question and other related issues as part of its three year Kent County 2020 Project, funded by the Frey Foundation.

During this first year of the project, WRI was able to update land use and cover for all of Kent County using aerial photography provided by the Kent County Agricultural Stabilization and Conservation Service. The updated data base was compiled in a fashion consistent with the Michigan Resource Information System (MIRIS). This enabled WRI to compare and statistically examine land use changes from 1978 through 1991.

Most of the project staff expected an increase in urban land use and a corresponding decrease in the amount of available open space. Few anticipated the amount of agricultural land lost, and fewer still expected an actual increase in the Open Field category. It is also interesting to note so little change in the Forest (Deciduous and Coniferous) and Wetland categories.

What does it all mean? How can we use what has happened in the past to predict what is likely for the future? WRI has invited several groups to help in answering these and other related questions. Included on the project are: the Grand Valley Metropolitan Council, the West Michigan



Environmental Action Council, and the Natural Areas Conservancy of West Michigan. Also joining in this effort are Gaines Township, Kent County Soil Conservation Service, Kent County Extension - Michigan State University, and the consulting firm Earth Technologies, Inc. The short term result is a Population Allocation Model in which existing population and land use trends are brought together to predict the expansion of urban growth.

WRI has extended its Kent County focus by beginning a land use analysis in several adjoining counties including Muskegon, Ottawa, and Newaygo. For more information contact WRI Research Associate John Koches at (616) 895-3792.

Migrant Camp Sampling Project

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Having ranked all camps, WRI contacted each camp owner to arrange for sample collection, beginning with those camps considered to be the most threatened. Using a technique called gas chromatography (or GC), WRI tested the samples for priority pollutant pesticides. In the end, WRI found that none of the samples analyzed showed evidence of pesticide contamination above the detection limits specified by the EPA for this procedure.

This is, of course, good news for camp owners and operators, but even better news for those laborers and their families who have chosen to spend their summer at these camps. For additional information about this program, contact John Koches at (616) 895-3792.

WRI and the OCCAA gratefully acknowledge the participation of the following migrant camp owners/operators:

Beuschel Fruit/Dairy Farms
Randy Bowerman
Duane Finkler
Joe Gavin
Stephen (William) Rasch
Reenders Blueberry Farms
Robert Reister
John A. Schaefer, Sr.
Emmett Schoenborn
Kenneth Schwallier
Zelenka Nursery, Inc.

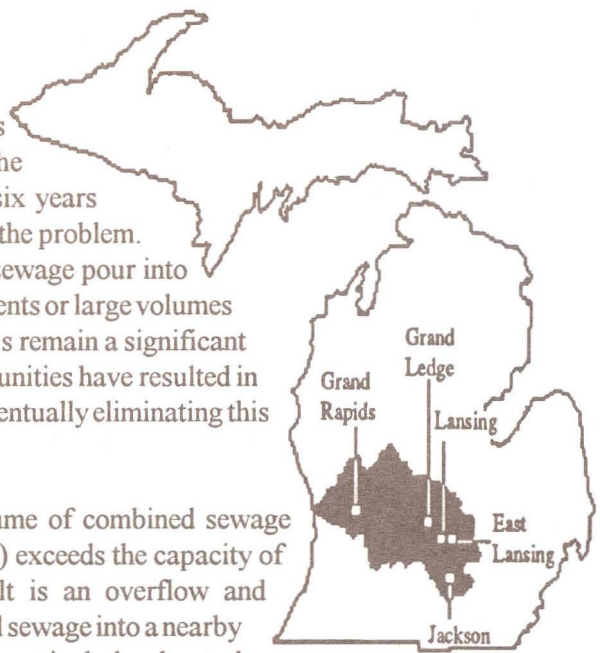
Combined Sewer Overflows in the Grand River Watershed

1994 Update

A Publication of the Grand River Watershed Program

Water Resources Institute

Combined Sewage Overflow (CSO's) Update



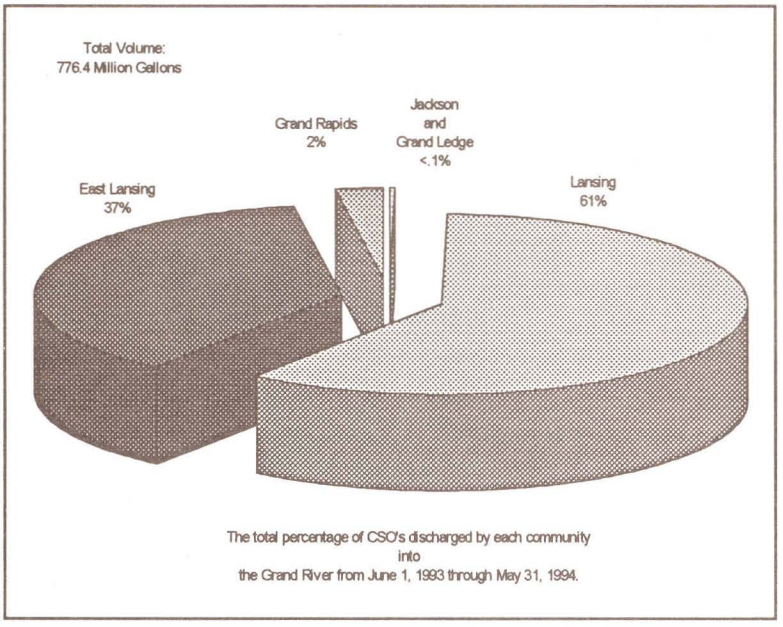
Combined Sewage Overflows (CSO's) continue to plague the Grand River Watershed nearly six years after the public became aware of the problem. Millions of gallons of untreated sewage pour into the Grand River following rain events or large volumes of melting snow. Although CSO's remain a significant concern, efforts by several communities have resulted in progress towards reducing and eventually eliminating this major source of point pollution.

Efforts by several communities have resulted in progress towards reducing and eventually eliminating CSO's.

CSO's result when the volume of combined sewage (stormwater and sanitary sewage) exceeds the capacity of a treatment facility. The result is an overflow and subsequent discharge of untreated sewage into a nearby stream. These sewage discharges include elevated levels of fecal bacteria, excessive nutrients, and other surface contaminants such as salts, oil, and grease. The addition of these pollutants into an already stressed system result in a general decrease in water and habitat quality.

Stormwater drains that in the past were connected to the sanitary sewers now contribute excessive volumes of water during some rain events forcing these sewers to overflow. As an example, the Red Cedar River in East Lansing receives raw sewage from overflows about 60 times a year. These CSO's are the result of a sanitary system that has not kept pace with the rate of growth and development in the surrounding area. The immediate needs of many communities include the separation of stormwater from sewer drains, and the construction of stormwater retention basins to "buffer" the surge in volume from stormwater drains.

Five municipalities along the Grand River are now actively engaged in modifying their existing sewer systems to prevent future CSO's. Their efforts have resulted in a degree of success from several significant discharge sites. The reporting period for the volume of CSO's discharged into the Grand River is from June 1, 1993 to May 31, 1994. It should be stressed that CSO's are weather related events and usually occur only when large amounts of rain or runoff come during a very brief time. The ability to measure significant progress must involve general trends from data collected over time. The following is a report on the five remaining communities with yearly CSO discharges and their plans to reduce and eliminate future CSO's.



The total percentage of CSO's discharged by each community into the Grand River from June 1, 1993 through May 31, 1994.

The City of Jackson is progressing with separating the city's industrial storm sewers from sanitary sewers. At least 10 catch basins which link stormwater with sanitary sewage are being eliminated per year. Their efforts helped to reduce total CSO's from 2 million gallons (MG) reported in 1993, to 895,000 gallons during the same reporting period ending in May 1994.

Grand Ledge reduced their CSO's from 13.8 MG reported in 1993 to just under 220,000 gallons for 1994. Much of this success was achieved by lining the sanitary sewer lines with a hard, glass-like material which has expanded the capacity of the system.

Lansing's total CSO's for 1994 were 467.3 MG, down from 597.6 MG reported for the same period in 1993. The recent installation of a large retention basin should eliminate an additional 3 CSO events per year, beginning this fall.

	1992	1993	1994
Jackson	<2 MG	2 MG	.9 MG
Grand Ledge	2 MG	13.8 MG	.22 MG
Lansing	500 MG	597 MG	467 MG
East Lansing	308 MG	300 MG	289 MG
Grand Rapids	340 MG	48.8 MG	19 MG
Year Totals	**1.15 Billion Gallons**	**962.2 Million Gallons**	**776.4 Million Gallons**

East Lansing reported just under 289 MG of CSO's for 1994, down from 300 MG reported in 1993. The city has submitted plans to the Michigan Department of Natural Resources (MDNR) to build a stormwater retention basin and improve existing wastewater treatment facilities to help in reducing their CSO's. Approval by the MDNR is pending.

Grand Rapids is currently about halfway through a $140 million sewer separation project on the city's west side. The project includes the installation of new sanitary sewer lines, stormwater drains and water mains. The project is expected to be completed in late 1996. These efforts, combined with the introduction of a large retention basin in March of 1992, contributed to lowering the city's total CSO's from 48.8 MG in 1993 to just over 19 MG during the same reporting period ending in May, 1994.

Additional information about CSO's can be obtained from the waste water treatment plants in each individual community or by calling Jeff Cooper at the Water Resources Institute at (616) 895-3271.

GVSU WATER RESOURCES INSTITUTE

Grand River Watershed Program
Water Resources Institute
Grand Valley State University
Allendale, MI 49401
(616) 895-3749

Principal funding for the Grand River Watershed Program is provided by The Grand Rapids Foundation

West Michigan Pollution Prevention Project Continues Outreach Efforts

The WRI West Michigan Pollution Prevention (WMP2) Project, a one year U.S. EPA funded program, continues to make a significant impact on business and industry. Recent activities of the WMP2 project have included facilitating a Muskegon-Ottawa Pollution Prevention Alliance (MOPP) Meeting at Donnelly Corporation in Holland. MOPP is open to all businesses in Muskegon and Ottawa counties as well as other companies throughout the state that would like to be involved in the networking. Jim Gillespie of Herman Miller Corporation and Bob Pleasant of Esco Corporation serve as chairpersons.

At the MOPP meeting, Susan Paauwe of Donnelly Corporation presented a perspective on environmental management. Julie Feldpausch of the Office of Waste Reduction Services (OWRS) provided information on the retired engineers program (ReTAP). According to Keith Fry, a ReTAP participant, the engineers are available for free waste assessments.

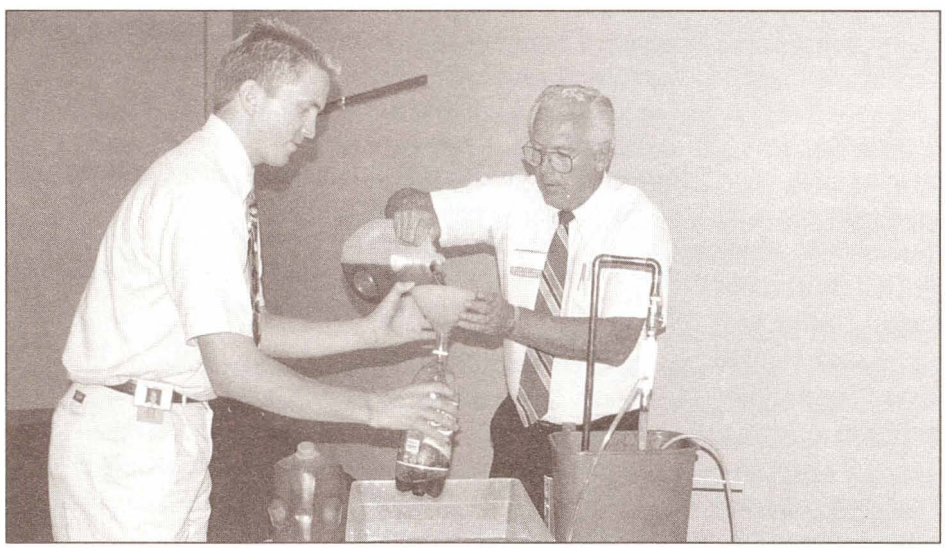
MOPP activities have helped the West Michigan Pollution Prevention Project to "spread the word" about pollution prevention (P2) and make P2 tools available to a wide audience in west Michigan. The goal of the project is to create a permanent infrastructure to promote pollution prevention through regional cooperation.

The WMP2 project supports the goals of the Lake Michigan Lakewide Management Program (LAMP) which are to reduce mass loadings of toxic pollutants from all sources, and to prevent further degradation of the Lake Michigan System from the release of toxic pollutants.

Specific objectives of the WMP2 are to foster "business helping business" pollution prevention programs in west Michigan, pilot the public partnership tools for coalition building, facilitate peer matching between businesses, publish a regional pollution prevention newsletter, and provide pollution prevention training sessions. Tom Lannon, a retired engineer, is available for a GVSU-WRI slide show presentation on P2. At the conclusion of the grant year, portions of the project will continue under the existing GVSU-WRI Waste Reduction and Management Program.

An important remaining element of the WMP2 project is sustainability. A videoconference about pollution prevention for small manufacturers on September 21 served as a catalyst in bringing together groups with an interest in sustaining pollution prevention. Sponsors of the event were the NIST/Midwest Manufacturing Technology Center, MERRA, the West Michigan Chapter of the Air & Waste Management Association, and the Grand Valley State University Water Resources Institute.

Participants at the conference viewed informational displays by the sponsors and the co-sponsors which included the Muskegon-Ottawa Pollution Prevention Alliance, Office of Waste Reduction Services, Business-Industry Team for the Environment, and the Michigan Recycling Coalition. All of these groups play a vital role in providing assistance for companies interested in pollution prevention projects. Janet Vail at WRI [616-895-3048] can provide further information on any of the organizations and the services they provide.



WRI Associate Tom Lannon (above right) demonstrates his fluid retrieval tool (a pollution

WRI Facilitates Leadership Workshops

Building Leadership Through Improved Negotiating Skills was the topic for two workshops organized in part by the Water Resources Institute (WRI) for Ottawa County township officials. The purpose of the workshops was to help participants become familiar with negotiating techniques that produce durable agreements and positive outcomes for both parties. Mr. Kenneth VerBurg, Department of Resource Development at Michigan State University, led both leadership workshops which demonstrated negotiating principles developed by the Harvard Dispute Resolution Center.

These workshops are being offered in a series of four training sessions planned by the Michigan Society of Planning Officials as part of their W.K. Kellogg Foundation grant, *County & Local Partnership for Groundwater Protection Zoning: a Michigan Demonstration Project.*

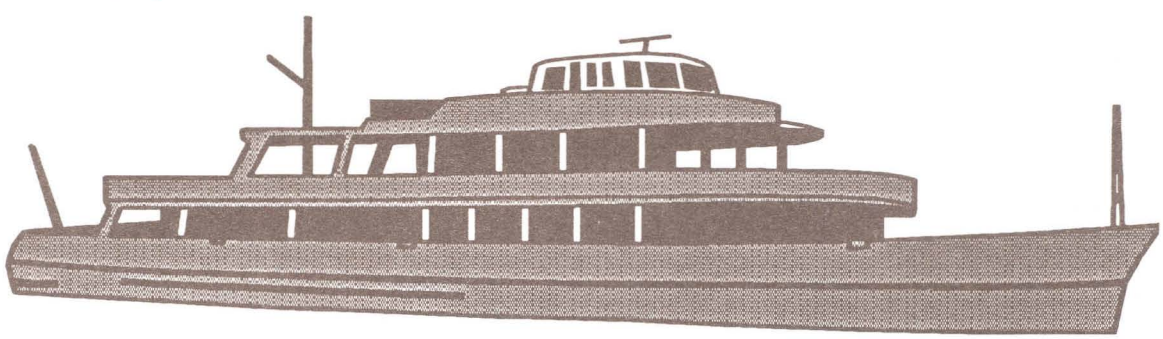
WRI also organized a Citizen's Advisory Committee to assist in implementing groundwater protection measures in Ottawa County. Members of the committee represent many different groups and organizations including regulatory agencies, educators, the farming community, and industry leaders. The first meeting for the group was held at Grand Valley State University's Allendale campus on September 8, where Mark Swartz, Michigan Department of Agriculture, discussed specific groundwater protection techniques available for the agricultural community.

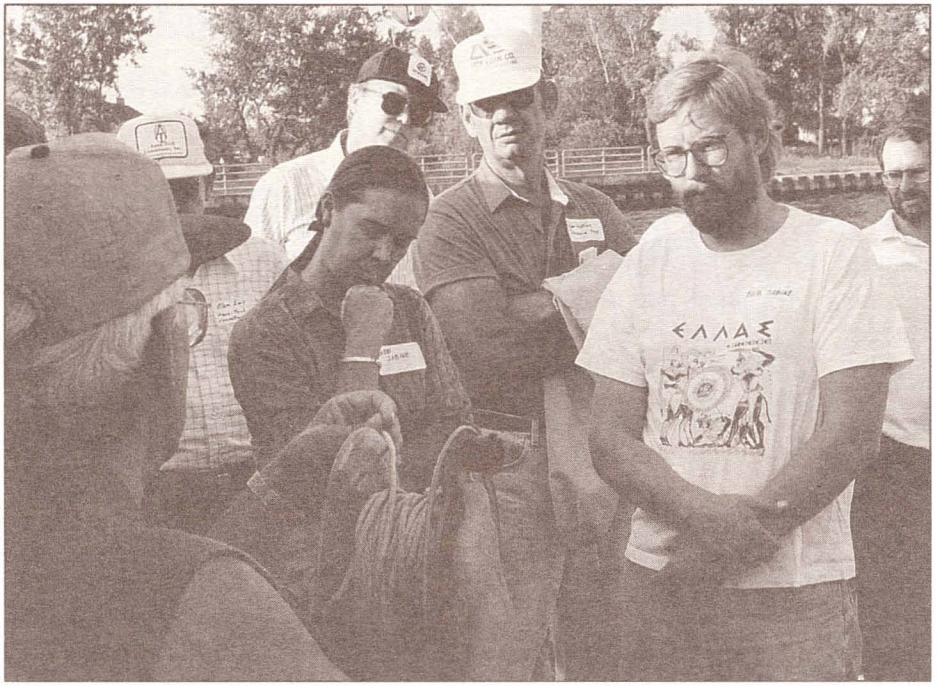
For further information regarding the Ottawa County Groundwater Protection Project, contact Patti Fisher at (616) 895-2527.

New Arrivals

The Water Resources Institute is pleased to announce the addition of two new staff members. Patti Fisher has joined us from Earth Technologies, Inc. She received her bachelor's degree from Dordt College in Iowa, and her Master of Environmental Science degree from Miami University in Oxford, Ohio. Patti is an environmental specialist with past experience in wetlands assessment and will be working with the Grand River Watershed and groundwater protection programs.

Alexey Stiop joins us from Great Lakes Environmental Laboratories and will be working as a research assistant in the analytical chemistry department. Alexey received his Masters degree from Mendeleev University in Moscow and specializes in metals analysis.





The Grand River Watershed Advisory Council's fall meeting was held aboard the D. J. ANGUS on September 13, 14 , and 15. Over 60 council members received first-hand experience of the activities aboard GVSU's research vessel as well as a "River's View" of some environmental concerns in the lower Grand River.

WATER RESOURCES

Review

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

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