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Annis Water Resources Institute

WATER RESOURCES
Review

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In this Issue...

NOTE: Don't miss the Lake Michigan: State of the Lake '99 Conference, November 8 – 9, 1999 in Muskegon, Michigan

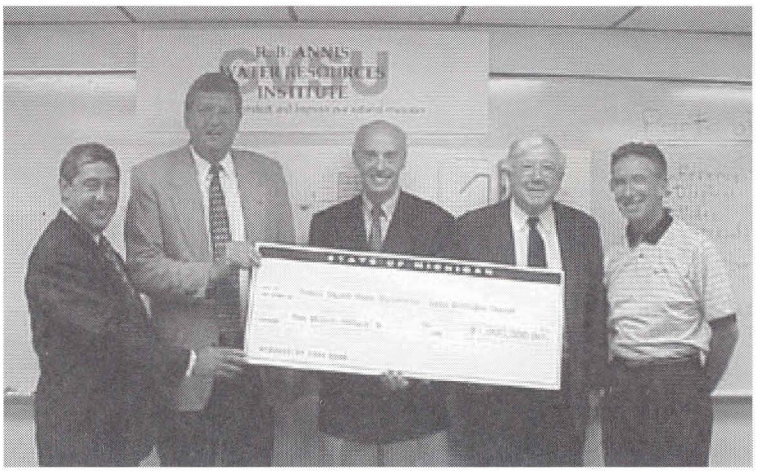
WRI Gets $1 Million From State For Lake Michigan Center

State Senator Leon Stille, along with area legislators presented a mock check of $1 million to GVSU officials on July 29, signifying the recent allocation of $1 million in state funding to help develop Grand Valley State University's Water Resources Institute Lake Michigan Center on Muskegon Lake.

Plans include moving the Robert B. Annis Water Resources Institute from the university's Allendale campus and developing the Muskegon site as a major Great Lakes educational and research center.

"Moving the facility to a waterfront site increases the university's ability to conduct important on-site research and testing," said Stille (R-Spring Lake). "This center will make Grand Valley a world leader in freshwater research." State Representatives Jon Jellema (R-Grand Haven) and Gerald Van Woerkom (R-Norton Shores) also made statements in support of the appropriation, which they encouraged the Governor to sign.

Plans for the site include a 20,000-square-foot research facility housing various laboratories, administrative offices, conference rooms and classrooms. The university's 65-foot research vessel, the *W.G. Jackson*, will be docked at the site.



Legislators present a check for $1 million to GVSU officials to help develop the Water Resources Institute Lake Michigan Center. Left to right are Grand Valley Board Member José Infante, Representative Van Woerkom, Senator Stille, President Lubbers, and William Schroeder, a member of the project's Campaign Cabinet.

Photo provided by www.gvsu.edu

Printed on recycled paper with soy ink

In Memory

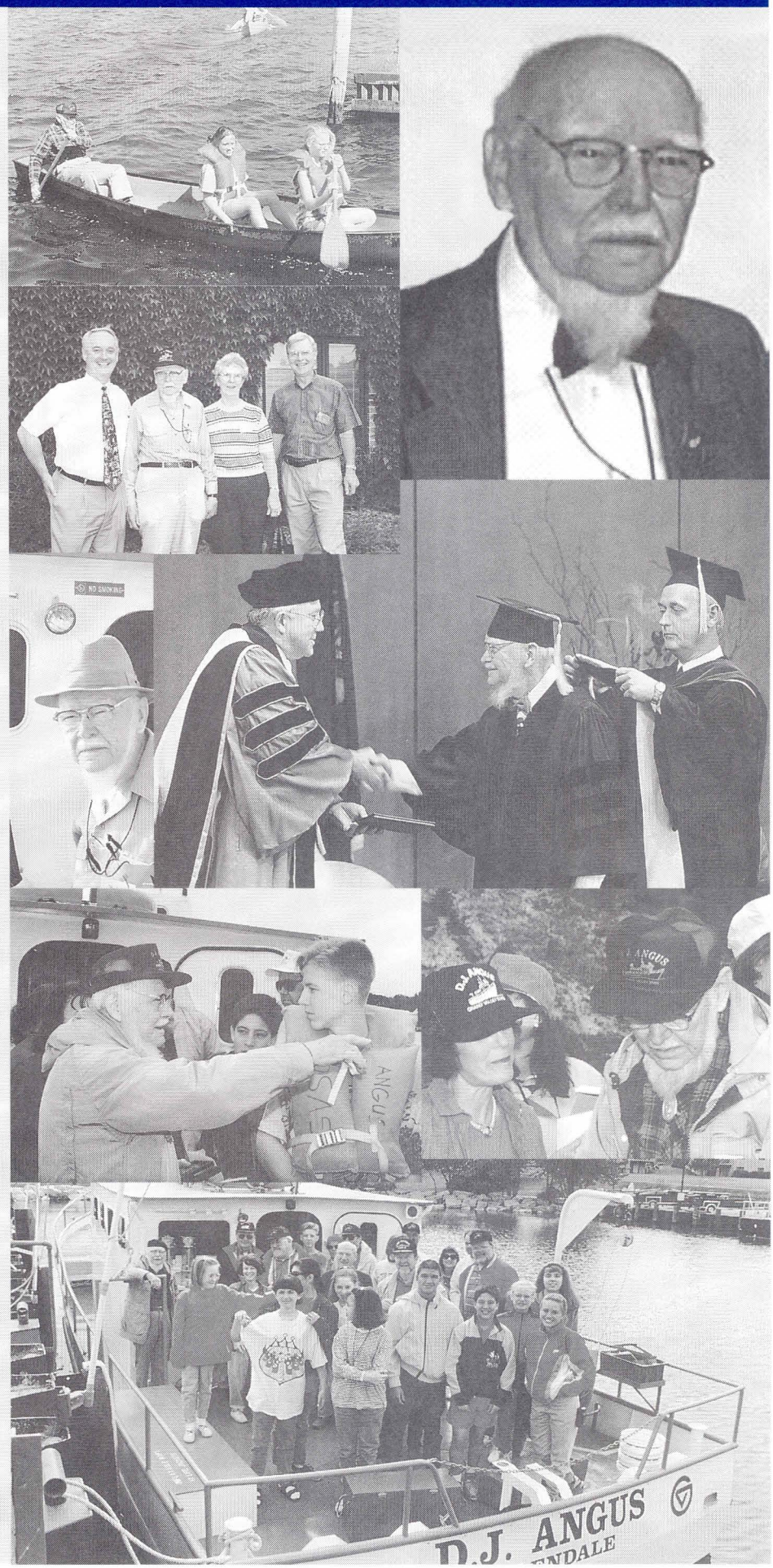
Robert B. Annis, a highly respected friend and supporter of Grand Valley, and particularly the Water Resources Institute, died on September 6 at the age of 92.

Annis, an Indianapolis scientist, inventor, and president of R.B. Annis Co., gained a national reputation for his creative problem-solving and for his expertise in the field of magnetism.

His long history with Grand Valley began in 1966, when he provided financial support for the 50-foot research vessel, the *Angus*, in honor of his mentor Donald J. Angus, of the Esterline-Angus Co. The *D.J. Angus*, a successor to the original vessel, continues to provide access to research cruises on Lake Michigan. It was the gift of the *Angus* that led to the development of the Water Resources Institute in 1986.

In 1993, the university recognized his dedication to furthering education by bestowing an honorary doctorate degree of science. The university honored him further during a ceremony in Indianapolis by naming WRI the Robert B. Annis Water Resources Institute in October 1997.

Ron Ward, Director of WRI, stated that "Bob Annis was dedicated to sharing his expertise with others. He was especially committed to mentoring youth and encouraging them in science and mathematics. The National Association of Science Teachers in 1999 recognized his accomplishments when they presented him their highest award for his achievements in informal science education. GVSU and WRI will miss his steady guidance, encouragement, and support".



WRI To Investigate Contaminated Sediments In Muskegon Lake

Dr. Richard Rediske, WRI Senior Program Manager, recently received a 2 year grant from the Great Lakes National Program Office to investigate contaminated sediments in Muskegon Lake. Muskegon Lake has been listed as an Area of Concern by the International Joint Commission because of historical sediment and water contamination. Collaborators on the project include Dr. Gary Fahnenstiel and Dr. Tom Nalepa at the National Oceanic and Atmospheric Administration's Great Lakes Environmental Research Laboratory, and Dr. Claire Schelske at the University of Florida.

The project will be conducted in two phases. Phase 1 will begin in October 1999 and consist of an investigation of 18 locations of known or suspected sediment contamination in Muskegon Lake. Sediment chemistry will be examined at each location along with studies of the benthic macroinvertebrate community and laboratory toxicity evaluations. Phase II will begin in April 2000 and consist of radiodating and stratigraphy analyses of core samples collected at locations that were identified in Phase I as areas of significant sediment contamination.

The data from Phase I will provide information on the nature and extent of sediment contamination in Muskegon Lake and be used to develop an initial assessment of the ecological status of the benthic community. Phase II will focus on the issue of sediment stability and determine if historical sediment contamination is buried under layers of clean material or actively mixed by wind and wave action. Mixing and resuspension of contaminated sediments was found to be a significant factor in the movement of historically contaminated sediments in White Lake in a previous investigation by the project team.

As part of this project, the Muskegon County Soil Conservation District and WRI will conduct a series of educational outreach activities to solicit public participation and to communicate the results of the investigation. The data from this project will be used to determine the current status of sediment contamination and to prioritize areas in Muskegon Lake for remediation. The information from the project will be important to local decision-makers as they consider the revitalization and development of the community.

For more information about the Muskegon Lake Sediments Project, please contact Dr. Richard Rediske, Senior Program Manager at (616)895-3047 or redisker@gvsu.edu.

Lake Michigan Center *continued from front*

"This commitment puts us past the $4 million mark in our $5 million project to get the Lake Michigan Center started," said Charles E. Johnson II, campaign chairman. "Many people have worked to make this happen, and it has come together splendidly."

"This state funding equals the largest private gift to this project – a $1 million grant from the Community Foundation for Muskegon County," noted Vice President Matthew McLogan. "The terrific private and public response to this campaign affirms its importance to our region and beyond."

The state funding was the result of an amendment to the State's supplemental appropriations bill introduced by Stille.

Outreach Efforts

WRI Partners With Regional Math & Science Center To Facilitate GLOBE

The Grand Valley State University Robert B. Annis Water Resources Institute (GVSU-WRI) GLOBE franchise offered its first training workshop for thirty-one educators this summer. GLOBE (Global Learning & Observations to Benefit the Environment) involves teachers and their students in taking measurements in atmosphere, hydrology, land cover, and soils for scientists who use the data in their projects.

A team of experienced national trainers led by Cyndy Henzel from Arizona facilitated the July 26th through July 29th workshop. Other trainers included Barb Diliegghio, Linda Lenar, and Gus Unseld. The Michigan Department of Education, Michigan Space Grant, and Consumers Energy provided funding for the workshop.

A unique aspect of GLOBE training at GVSU is that participants have the opportunity to do hydrology protocols aboard research and education vessels on Lake Michigan. The participants spent a day at the Muskegon Field Station practicing protocols aboard the *W.G. Jackson* as part of the workshop.

According to one participant, GLOBE "was the most informative and beneficial training I have ever taken part in. The knowledge of the instructors was impeccable and their enthusiasm contagious. Thank you, sincerely, for making this happen." The formation of a GLOBE users group, facilitated by GVSU's Regional Math & Science Center and the WRI, is planned for Fall 1999. This will be an opportunity for teachers to update their skills and to interact with one another during the school year.

Currently, WRI's onboard science instructors are revising the education program offered on the vessels to match GLOBE protocols. For more information, visit the WRI web site at http://www4.gvsu.edu/wri or E-mail vailj@gvsu.edu.

Grand Forum First Odyssey

Over thirty Grand Forum members participated in the **First Odyssey: Making Lake Michigan Great** with a day in Grand Haven and a day in Muskegon. The Odyssey was arranged by GVSU-WRI in conjunction with the GVSU Grand Forum, a lifelong learning group for senior citizens.

On August 10th, Dr. Janet Vail of GVSU-WRI began the Odyssey with a talk on Lake Michigan policies and research. This was followed by a presentation by Dave Seibold author of *Grand Haven: Coast Guard City*. A field trip to Kitchel-Linquist Dunes Preserve to study sand dune ecology, a cruise on the *D.J. Angus* for river and lake ecology, and a visit to the Grand Haven Coast Guard Station rounded out the day.

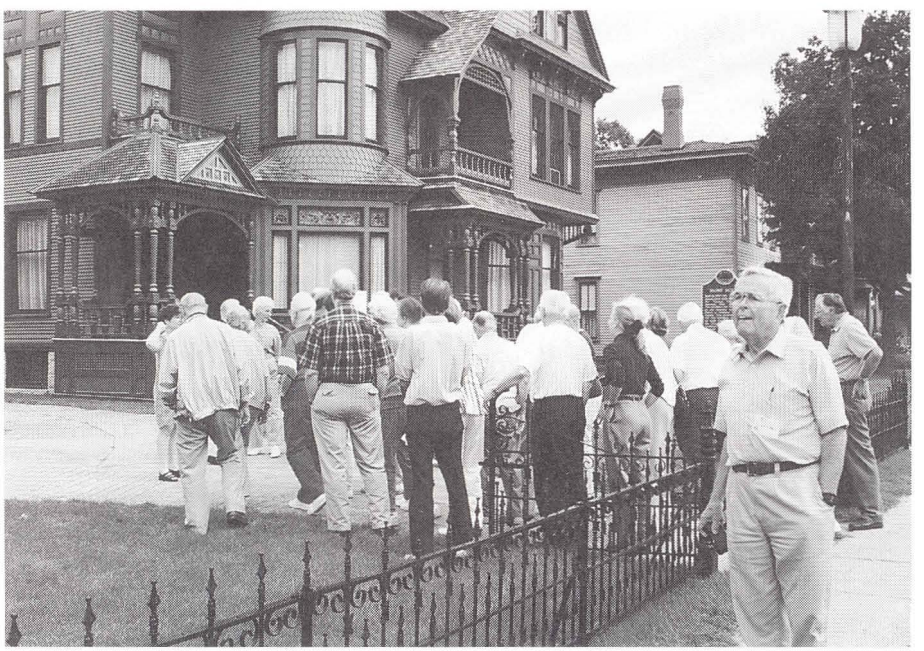
Outreach Efforts

On August 12th, the group met at the GVSU-WRI Field Station in Muskegon, Michigan where Chuck Pistis of Michigan Sea Grant discussed exotic invaders. John McGarry, Director of the Muskegon County Museum, welcomed the Forum to the Museum and the Hackley and Hume Houses. Muskegon Lake was highlighted in an afternoon cruise aboard the *W.G. Jackson*. Dr. William Jackson closed the session with a slide show of the Muskegon shoreline thirty years ago and now.

According to Mary Buckmaster, Grand Forum Director, many of the participants have been "involved in environmental issues and loved learning more, which will lead to greater understanding of the ecosystem". The two-day odyssey was a prototype for possible Elderhostel-type activities at GVSU-WRI. For more information about the Grand Forum, contact Mary Buckmaster at (616) 771-6615.

WRI Joins City Of Grand Rapids In Information And Education

The Robert B. Annis Water Resources Institute has joined with the City of Grand Rapids in a comprehensive Public Information and Education Program related to Stormwater Permits. The City is preparing and implementing a Stormwater Permit as part of the US Environmental Protection Agency's National Pollution Discharge Elimination System (NPDES) and has requested WRI's assistance in this effort.



The project provided funding for a series of performances by The Bear Creek Players, WRI's theatrical troop developed as part of the Bear Creek Watershed Project, at area schools this last spring. WRI will also assist the City in the development of a web page that introduces their stormwater management programs, creation of a program brochure, and hosting a training workshop intended to provide non-profit organizations, government officials, and watershed planners insights in how to create effective communication programs. The workshop was given a high priority as many stormwater related problems have their origin outside the City's boundaries, and cooperation of many different decision makers will be required in order to solve stormwater and other non-point source pollution problems.

The training workshop, entitled "Communicating For Results…Getting Your Message To The People Who Need To Hear It", is scheduled for October 7, 1999 in Grand Rapids, Michigan. There is a $15 registration fee to cover the cost of refreshments. For more information about the workshop please contact Andrea Pickens at (616) 895-3749 or pickensa@gvsu.edu.

Making Lake Michigan Great

Making Lake Michigan Great '99, the highly successful tour of GVSU's *W.G. Jackson* research and education vessel, visited 12 ports of call this summer. Funded by the U.S. Environmental Protection Agency's Lake Michigan Forum, the tour spread the word about lakewide management planning and linked people throughout the basin.

Muskegon
About 500 alumni and staff were on hand at the GVSU's Muskegon Field Station to celebrate the tour as well as to view power boat races (Muskegon Shoreline Shootout). Environmental professionals from west Michigan toured Muskegon Lake the following week, officially kicking-off the tour.

Waukegan
Susie Schreiber and Ray Kalicki of the Waukegan Harbor Citizens' Advisory Group (CAG) organized the activities in Waukegan. Groups taking cruises included the students in a Waukegan Park District program, Boy Scouts, Girl Scouts, elected officials, high school students, the College of Lake County, and the general public. An open house and display complemented this stop on the tour.

Chicago
Navy Pier was the location for the Chicago stop. Jennifer Blitz of the Chicago Academy of Sciences was the coordinator. For two days, there were open houses and tours for the general public as well as Girl Scouts and Boy Scouts.

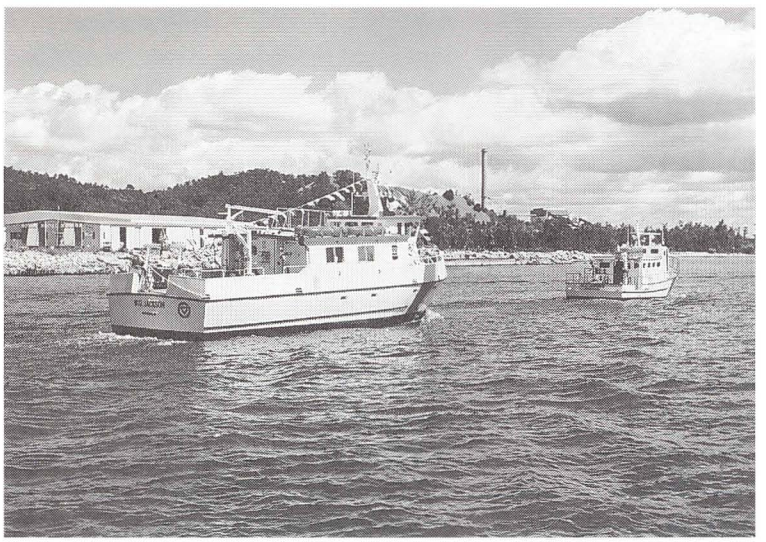
East Chicago
Activities in East Chicago were handled by Adriane Esparza of the East Chicago Waterway Management District. East Chicago Central High School students experienced hands-on water quality testing.

St. Joseph
Al and Margaret Smith of the Friends of the St. Joseph River welcomed the vessel to St. Joseph. Tours for the general public and a middle school, an open house, and a display were the venue. The mayor, the city manager, and other public officials of St. Joseph attended a special open house at the conclusion of this stop.

South Haven
Kenneth Pott of the Michigan Maritime Museum in South Haven was the host for this port. Students from Baseline Middle School and from L.C. Mohr High School sampled the water in the harbor and in Lake Michigan.

White Lake
The City of Whitehall again welcomed the *W.G. Jackson* to the annual Celebrate White Lake. Over 130 people enjoyed sampling cruises on White Lake. Forum member Kathy Evans of the Muskegon Conservation District coordinated the event. Greg Mund of the District was also on hand to answer questions. Tanya Cabala and Liz Vos of the Lake Michigan Federation presented information on the Lake Michigan Mass Balance Study.

Grand Haven
The *W.G. Jackson* joined eight Coast Guard vessels and one Canadian ship at the annual Coast Guard Festival in Grand Haven. Over 200 visitors came aboard during the stay. The Coast Guard was celebrating 75 years in the Grand Haven area. Festivities for the weeklong event included a parade, carnival, ship tours, and the spectacular musical fountain. On August 7, the city of Grand Haven



was officially designated "Coast Guard City USA".

Manitowoc
Sandra Zipperer from the Wisconsin Maritime Museum arranged the visit of the *W.G. Jackson* to Manitowoc. The groups onboard included 4th grade students from Manitowoc Schools, the YMCA Children's Program, and an adult group with museum personnel and Big Brothers/ Big Sisters. An open house was also held.

Green Bay
Forum Co-chair Ron Baba and Inez Dommer organized the stop at Green Bay. Barry Peterson of Wisconsin Public Service Corporation and the City of Green Bay constructed a special dock arrangement for the *Jackson* on her Green Bay visit. There were six cruises at this port and two open houses. The general public and representatives of the Green Bay Metropolitan Sewage District, Wisconsin DNR, Wisconsin Sea Grant, University of Wisconsin, and Brown County Land Conservation experienced water quality testing. Girl Scouts also enjoyed a cruise.

Sturgeon Bay
Roy Aiken, Executive Director of the Door Property Owners group, hosted the Sturgeon Bay visit. Three cruises allowed Sturgeon Bay area residents to do water sampling. There was an end of the day open house. Mike Toneys of the Wisconsin DNR made dockage possible.

Milwaukee
The *W.G. Jackson* was a part of the program at the International Joint Commission Meeting in Milwaukee on September 24-26. There were seven educational cruises with a special cruise for IJC dignitaries and quests.

Conference
The tour will close with the **Lake Michigan: State of the Lake '99** conference to be held in Muskegon, Michigan November 8 and 9. The conference is open to the public and more information is available on the back page of this newsletter.

Recap
Making Lake Michigan Great '99 touched the lives of over 1,700 people who were able to go on the vessel and hear about planning for Lake Michigan. The Lake Michigan Forum has *Making Lake Michigan Great 2000* in its workplan. It is hoped that funding will again be made available from U.S. EPA. If you are interested in being a host for a port of call in 2000 or participating in the November conference, please contact Janet Vail at (231) 728-3285 or vailj@gvsu.edu.

Watershed Management

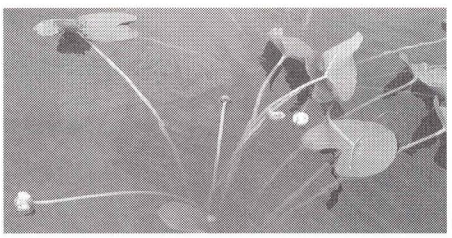
Rogue River Watershed Project Builds Momentum

The WRI, working with the Grand Valley Metropolitan Council (GVMC), has been awarded a Section 319 Watershed Management Planning Grant from the Michigan Department of Environmental Quality for the Rogue River Watershed. The Rogue River is a highly prized, nationally recognized trout stream, located in one of the fastest growing metropolitan areas in Michigan.

The Rogue River Watershed is 167,625 acres in size and shares its boundary with five west Michigan counties: Kent, Ottawa, Newaygo, Muskegon, and Montcalm. This is a much larger watershed than what has been typical for the Section 319 program and will require a new approach when it comes to water quality assessment procedures, public education, and information dissemination. The WRI has already divided the watershed into 12 smaller, more manageable subwatersheds. The Institute will characterize each of these separate subwatersheds to determine what water quality problems currently exist and to strategize what corrective measures would be appropriate. WRI intends to help organize a stewardship team for each subwatershed. Team members will include interested residents, scientists, outdoor enthusiasts, local officials, and others interested in the Rogue River and its many tributaries. Stewardship teams will help coordinate local initiatives such as water quality monitoring, stream clean-up, and restoration activities.

Rogue River Watershed Project

While agricultural nonpoint source pollution remains a concern throughout west Michigan and is a factor in the Rogue River Watershed, the more significant threat to the Rogue and its tributaries is encroachment from urban growth. The conversion of land from rural to urban use has had a



devastating effect on both surface and groundwater resources throughout Kent County. Construction activities together with the continued addition of impervious surfaces have resulted in accelerated erosion, sedimentation, and loss of prime aquatic habitat. The expansion of sewer and water service is expensive. Municipalities are witnessing an increase in individual septic systems and groundwater fed well supplies causing concern that this will lead to an increase in aquifer contamination, substantial health risks, and further degradation of water quality.

The objective of the Rogue River Watershed Project is to control urban development while encouraging economic growth. Management of urban growth at this scale can only be accomplished using a regional approach. The GVMC has already identified the Rogue River Watershed as one of six within the Grand Rapids metropolitan area that will undergo detailed planning as part of other initiatives currently underway. Hence, WRI has formed a partnership with GVMC as a first step in its management strategy.

York Creek Watershed Project Wraps Up

With the award of the first Planning Grant from the Michigan Department of Environmental Quality in 1992, Alpine Township and the WRI began a partnership to benefit the York Creek Watershed that has lasted more than seven years.

The 2,110 acre watershed, located just northwest of the City of Grand Rapids, was chosen to receive this grant not because it was a high quality and much prized trout stream, but because it once was. Field Surveys conducted by the Michigan Department of Natural Resources in 1969 characterize York Creek as having a good trout population. Similar surveys also conducted by MDNR in 1987 showed a marked decrease in trout numbers. Finally, in 1991 MDNR surveys reported the complete absence of trout species. Early in the study it was determined that the decline in trout is not the result of some pollutant discharge to York Creek but the sedimentation of the stream and loss of important habitat. This sedimentation is directly related to development that has occurred in the York Creek watershed, and more specifically is the consequence of untreated and unregulated stormwater runoff.

Watershed Management

Although the project provided a great deal of valuable information, perhaps the most important lesson learned as a result of the York Creek Watershed Project is that it is easier and far less expensive to deal with stormwater management issues before they become problems. It is increasingly difficult to retrofit stormwater structures in an area already developed with building, parking lots, and five lane roadways. Alpine Township has taken its experience in York Creek and is applying what it has learned to the management of stormwater throughout the Township. Township officials are currently working to create a stormwater ordinance intended to reduce the impacts that have resulted from new commercial, industrial, and residential development. As important as this new ordinance might be for Alpine Township, this process has led to similar initiative in neighboring townships and in Kent County.

WRI is particularly pleased with the impact made by the Decision Support System (DSS) developed for Alpine Township. This computer based mapping system was the first of its kind to operate at a township level in Kent County. The practical and extremely adaptable tool has received a great deal of attention and support and is undoubtedly one of the reasons that Alpine Township officials and others have been so supportive of Geographic Information System development for the entire Kent County community.

WRI's participation in the York Creek Watershed Project will reach a milestone come September 30, 1999 as this date marks the conclusion of the most recent grant. The Institute thanks those township officials and residents that have given so much time and effort in making this project a success.

GIS Completed For Pentwater River

The WRI has just completed a one year project working with the West Michigan Shoreline Regional Development Commission (WMSRDC) and the Oceana County Conservation District (OCCD) to develop a computer based Decision Support System (DSS) for the Pentwater River Watershed.

The Pentwater River Watershed DSS is a Geographic Information System (GIS) using the ArcView computer program development by ESRI. The DSS includes soils, current land use, historical land use, flood plains, and other watershed related elements and is used to help identify and display "critical areas" where erosion, sedimentation, and other problems impacting water quality and aquatic habitats exist.

WRI has presented the Pentwater River Watershed DSS to the WMSRDC and the OCCD on a CD-ROM and will provide these and other partners training in its use. The DSS is both easy to use and readily upgradable making it a powerful and valued tool.

In addition to the CD-ROM, WRI has compiled a 35 page Map Atlas that highlights some of the more essential components of the DSS. WRI has found that these "paper" maps compliment the interactive DSS giving a more conventional look to the analysis that was undertaken. Watershed residents and others interested in the Pentwater River can easily view these individual map products without the need for sophisticated computer systems or any training. While it lacks the flexibility offered by the DSS, the Map Atlas provides information about the watershed in a straightforward and concise manner.

For more information about the WRI's Watershed Management activities, please contact John K. Koches, Senior Program Manager, at (616)895-3792 or kochesj@gvsu.edu.

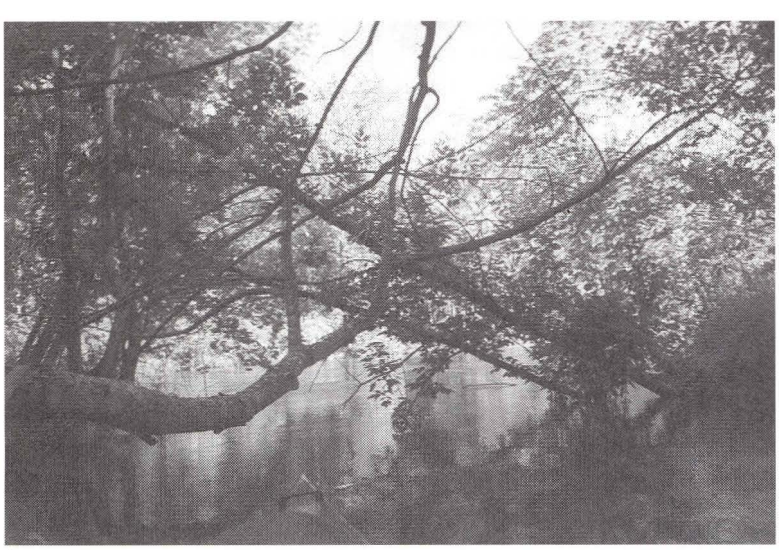
Land Use Initiatives

Muskegon Land Use Analysis Complete

The WRI began its land use initiative for Muskegon County in December 1996 with a grant from the Community Foundation *for* Muskegon County. The project was divided into three phases. In Phase I existing land use information was used to create a series of map products showing the change in land use between the years 1978 and 1992. Phase II required the interpretation of aerial photographs and the classification of 1997 land use and land cover and resulted in the creation of a map atlas and CD-ROM intended to document contemporary land use conditions. The WRI has just completed the final project phase.

Phase III used information provided in Phases I and II as a benchmark in predicting future land use needs. WRI used past trends to predict the distribution of future population growth. Linking trends in land use with population projections, WRI has created a Geographic Information System Model, the Population Allocation Model (PAM), capable of simulating future residential growth.

PAM assesses three criteria critical to the distribution of new housing. First, the availability of land for future development must be identified. Where do we find land that is not already developed or held by the private or public sector as open space? PAM excludes from future residential use existing urban areas plus parks, preserves, and other lands set aside for recreation, research, and other purposes. The model also evaluates the desirability of land for development. Twelve separate factors including the availability of municipal water and sanitary sewers; the existence of other urban development such as schools, shopping centers, roads, and highways; and the proximity to natural features such as lakes, streams, and forest lands are used. Finally, each local unit of government is assigned its own growth potential based on past population trends and future predictions. Given an estimate of future population, PAM calculates the amount of land that will be needed to accommodate this growth and then distributes new housing given preference shown by previous home buyers. PAM can be used to simulate the impact of zoning changes and other land use policies such as the use of urban growth boundaries. WRI uses PAM to estimate the impact new growth might have on water quality and other natural features.



WRI Assists In Study Of Lake Level Impacts

The WRI was recently awarded a grant from the Detroit District of the U.S. Army Corps of Engineers to inventory current land use. Using Ortho-photography provided by the Corps, the WRI will classify land use for the shoreline portions of Emmet, Charlevoix, and Antrim Counties, Michigan. These analyses will be used by the Corps in their Lake Michigan Potential Damage Study.

Begun by the Corps in 1996, the Lake Michigan Potential Damage Study differs from previous investigations. "Damage Surveys" conducted in the 1970's were primarily interested in the actual loss of property due to extreme lake level conditions. This more recent task is a comprehensive assessment related specifically to the economic value of shoreline interests. What are the costs to property owners if water levels continue to range as they have over the last 120 years, and how would these costs differ if the climatic conditions or management plans would effectively higher or lower these levels?

For information on either of these projects, please contact John Koches, Senior Program Manager, at (616)895-3793 or kochesj@gvsu.edu.

WRI Awarded Michigan Great Lakes Protection Fund Grant

The Michigan Department of Environmental Quality-Office of the Great Lakes, has recently awarded WRI a grant as part of its 1999 Michigan Great Lakes Protection Fund (MGLPF) Program. The project, titled *The Costs and Benefits of a Marketable Development Rights Program,* began in July and will conclude in September 2000.

A Marketable Development Rights (MDR) program is essentially a tradable permit program allowing each local unit of government to decide how much of its remaining land will be developed. Once this decision is made, it then distributes an appropriate number of permits to land owners holding undeveloped lands; however, the individual land owners decide what to do with their "development rights". The landowners may choose to sell them, use them to develop their land, purchase additional rights to develop more of their land, or hold them for future use or sale. A MDR program guarantees preservation of land, spreads the cost of preservation equitably, costs little to administer, and offers considerable flexibility in the allocation of open space.

Dr. Paul Thorsnes, Assistant Professor of Economics at GVSU, has been working with WRI for the past year to create a simulation model for the purpose of testing a proposed MDR program. The model was created using information gathered from Alpine Township located northwest of Grand Rapids in Kent County, Michigan. Results from this simulation were encouraging and indicated that a MDR program could be an important tool for those local units of government actively pursuing the preservation of open space and farmland.

The MGLPF grant will allow the simulation model previously applied in Alpine Township to be applied to Plainfield Township, further calibrating the model. Much of Alpine Township is used for agriculture; however, Plainfield Township, located east of Alpine Township, has experienced extensive urban growth. The newly calibrated model will be used to determine if a MDR program would have been effective in preserving land that was actually converted to urban use.

WRI will be working with decision-makers in both Alpine and Plainfield Townships as it perfects the model and tests the proposed MDR program. Representatives for the Greater Grand Rapids Home Builders Association and the North Kent Townships Association have also expressed interest in the project and will be consulted as part of the assessment process.

For more information about the MDR program please contact John K. Koches, Senior Program Manager at (616) 895-3792 or kochesj@gvsu.edu.

Lake Michigan: State of the Lake '99
November 8 – 9 , 1999
Muskegon, Michigan

GVSU-WRI invites you to attend ***Lake Michigan: State of the Lake '99***. This conference will be held in Muskegon, Michigan on November 8-9, 1999 in cooperation with the United States Environmental Protection Agency Lake Michigan Forum.

As a follow-up to the International Joint Commission Meeting, ***Lake Michigan: State of the Lake '99*** will be an opportunity for government agencies, scientific researchers, policy makers, and the general public to communicate with one another on current Lake Michigan issues. This two-day event will have both general and breakout sessions.

Speakers will be presenting information on the Lake Michigan Lakewide Management Plan, lake levels, exotic species, the Lake Michigan Mass Balance Study, and many other projects of interest to all concerned about Lake Michigan.

For registration or more information, contact WRI at (616)895-3749 or vailj@gvsu.edu.

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Dr. Ronald Ward, Director

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