

Report for 2002MI1B: Natural Resources Integrated Information System

- Conference Proceedings:
 - Brown, E.M., D. Ouyang, A.J. Asher, J.F. Bartholic. 2001. Interactive Distributed Conservation Planning. Poster presented at the Integrated Decision-Making for Watershed Management Symposium: Processes and Tools, Blacksburg, VA, January 7-9. Proceedings on CD, 10 pp.
- Other Publications:
 - Witter, S.G., R. Kline-Robach, D.T. Long, J.F. Bartholic, and F. Poston. 2001. MSU-Water: A New Way of Addressing Water Quality Challenges. Published in the University Council on Water Resources, Feb. 2001, pp. 47-59.
 - Ma, Y., J. Bartholic, A.J. Asher, Y. Shi, O. Da, J. Grigar, 2001. NPS Assessment Model: An Example of AGNPS Application for Watershed Erosion and Phosphorus Sedimentation, Institute of Water Research, Michigan State University. Published in the Journal of Spatial Hydrology, on-line at www.spatialhydrology.com/journal/index.htm, Current Issue: Vol. 1, No. 1 Fall 2001, (must have Adobe Acrobat Reader), 8 pp.
- unclassified:
 - Bartholic, J., K. Wayland, L. Bruhn, S. Witter, C. Fridgen. 2001. MSUs Virtual Watershed Program: An Internet-based Academic Credit or Professional Certificate Program in Watershed Management. Presented at the National Association of Environmental Professionals 26th Annual Conference, Arlington, VA, June 24-28; in press.
 - Brown, E.M., D. Ouyang, A.J. Asher, J.F. Bartholic. 2002. Interactive Distributed Conservation Planning, Institute of Water Research, Michigan State University. Journal of American Water Resources Association: Special Issue on Integrated Decision-Making for Watershed Management; August 2002.
 - Kerr, J., D. Ouyang, and J. Bartholic. 2002. Targeting Watershed Interventions for Reduction of Nonpoint Source Pollution. Department of Resource Development and Institute of Water Research, Michigan State University. Journal of Soil and Water Conservation; submitted paper. Research funded by the U.S. Geological Survey with technical assistance from the Michigan Natural Resource Conservation Service-Steve Law.

Report Follows:

Michigan Institute of Water Research
Water Research Institute Program Report for FY 2002
Submitted by Dr. Jon Bartholic, Director

Introduction

The Institute of Water Research (IWR) at Michigan State University (MSU) continuously provides timely information for addressing contemporary land and water resource issues through coordinated multidisciplinary efforts using advanced information and networking systems. The IWR endeavors to strengthen MSU's efforts in nontraditional education, outreach, and interdisciplinary studies utilizing available advanced technology, and partnerships with local, state, regional, and federal organizations and individuals. Activities include coordinating education and training programs on surface and ground water protection, land use and watershed management, and many others. (An extended introduction can be found in our FY2001 Annual Technical Report.) We also encourage accessing our web site which offers a more comprehensive resource on IWR activities, goals, and accomplishments; www.iwr.msu.edu.

Project Number: 2002MI1B

Start: 03/01/02 (actual)

End: 02/28/03 (expected)

Title: Natural Resources Integrated Information System

Investigators: Jon F. Bartholic, Institute of Water Research, Michigan State University

Focus Categories: M & P, WQL, MOD

Congressional District: eighth

Descriptors: Data Analysis, Data Storage and Retrieval, Information Dissemination, System Analysis, Geographic Information Systems, Water Quality Management, Watershed Management

Areas of Relevant Research

The management of water resources, appropriate policies, and data acquisition and modeling continue to be at the forefront of the State Legislature's agenda and numerous environmental and agricultural organizations. Our contribution to informing the debate involved numerous meetings, personal discussions, and most importantly, the enhancement of web-based information to aid in the informed decision-making process.

Research

The key underlying effort is to provide an integrated approach to surface and groundwater assessment and management while allowing individuals to examine particular impacts on specific components of the hydrologic cycle, i.e. irrigation for crop production, all potentially impacting the aquifer draw down and horizontal flow to wetlands and streams. We continue to use new information technologies as they are developed in order to assist in presenting physiographic and human characterization of activities across watersheds of the state. Such integrated presentations continue to be provided, to the maximum extent possible, via the web and new enhanced delivery software.

Results and Benefits

Our web-based offerings continue to expand. A Nation-Wide Digital Watershed web site has been developed to allow individuals from across the United States locate themselves by using their address, watershed, or by regional areas established by the EPA. The illustration shows the software developed in the IWR that can be applied to a national situation. The data used in the system was acquired from EPA Basin data via the web. The site for Michigan allows users to zero-in on the eight-digit watersheds and then down to the 12-digit watershed system known as "Know Your Watershed." A special web site was prepared for the Kalamazoo Watershed project to assist them in prioritizing and developing a watershed management strategy. A substantial effort has been completed using all the digital orthoquads (DOQQ) available across Michigan. These have been acquired and seamlessly integrated with quality control and compression algorithms. This information now serves as a backdrop on our "Know Your Watershed" web site. The DOQQ integrated data set is also used as a backdrop for soils information on IWRs new EZMapper web site. This site was specifically designed to aid with Comprehensive Nutrient Management Plan development for agricultural farms throughout the state. The system allows downloading of software to outline fields and utilize the available data.

IWR, Purdue University, and EPA Region 5 organized a workshop that examined web-based tools for land use and watershed planning. The Mapper is now under way to serve-up these tools across all states within Region 5, along with obtaining the same data that would be common for each state.

The web-available Mapping is used extensively in IWRs Virtual Watershed Management courses. This past year we completed Module 4 in the series for Watershed Management Certification. There are now over 200 students registered per year in this course series.

Our work with the Michigan Department of Environmental Quality (DEQ) continues at a high level. With funding, between \$700,000 and \$1M dollars per year, is largely the result of the Institutes' responsibilities recognized statewide.

Our strategic plan for the Michigan Institute of Water Research (IWR) over the next five years has been developed and submitted to the Director of the Michigan Agricultural Experiment Station, the Dean of the College of Agriculture and Natural Resources at Michigan State University (CANR-MSU), and subsequently to the Office of the Vice President for Research and Development. The strategic plan outlines a number of key strengthening components for the MI IWR. (1) The affiliate positions within the Institute. These positions might be 25% time in the IWR and 75% in a discipline department. A group of affiliates would greatly strengthen the discourse relative to problems and techniques for solving them as well as the information dissemination. Additionally, adjunct faculty are generally somewhat less involved but enhanced mutual awareness of our programs would greatly enrich the pool of expertise of water scientists from which we could draw upon in order to more effectively address issues of concern within IWR. (2) Enhanced funding for the IWR: New Fiscal Support. Facilitating a competitive grants program in the water arena has been proposed. Preliminary discussions relative to the plan are leading to the strong possibility of adjunct and joint affiliate positions, but any new funding is on hold in light of the State's budget difficulties.

Related Research

We continue to obtain synergistic impacts by closely aligning our efforts with support from such organizations as the Corps of Engineers, USDA, US Forest Service and numerous other agencies and NGO's. This past year we received a grant from the Corps of Engineers for \$60,000 which involves estimating sediment delivery from each of the eight-digit watersheds within the entire U.S. side of the Great Lakes Basin. This database is not only of value to the Corps in prioritizing their efforts but also provides us with a broad set of additional information that we can use in other programs, and for assisting with the prioritization of high risk areas for erosion throughout the region. USDA funds involve a coordinating effort of outreach and research among all states within the EPA Region V. IWR personnel are partially funded through this regional project which coordinates and facilitates the communication of research methodologies, approaches, and results from our research and aides with region-wide outreach programming.

Training Potential

New graduates and graduate training continue to be a high priority of IWR. Unfortunately, graduate stipends have increased to the extent that a 1/2 time graduate student with fringe benefits, requires from \$30,000-\$40,000 (per year). We will make every effort to continue incorporating graduate students but with the high cost, it is increasingly difficult to employ more than a few students at any given time.