



Maryland Water Resources Research Center

Department of Civil & Environmental Engineering
University of Maryland
College Park, Maryland 20742



Spring 2003 Allen P. Davis, Director Phil Kearney, Associate Director

FROM THE DIRECTOR'S DESK

Greetings:

As we begin a new year, troubled waters appear ahead, certainly in the near term. The State of Maryland is facing a huge budget deficit, with more of the same expected next year. Most of us, I assume, have seen the forecasts, and they are grim. Similarly, at the Federal level, budget appropriations still have not been approved for FY2003, delaying the workings of the Center. We have some excellent research that we hope to fund, but until a budget for the Department of Interior is finalized, with appropriations for the Water Resources Research Institutes, we cannot commit this funding. A planned revamping of funds for the National Science Foundation has been halted by the delay. Some progress has been noted over the past few days and hopefully progress will continue

Nonetheless, our needs for water research continue to be strong. Continued population growth in the Chesapeake Bay watershed stresses our available water supplies and the health and well-being of the numerous streams and tributaries of the Bay. Recent rains (and snow and ice) have greatly improved stream flows that were stressed by last summer's drought. Baseflows and groundwater levels, nevertheless, have not yet completely recovered in some areas of the state and a few months of below-average precipitation could again put us on alert.

In the meantime, I urge you to be vocal in

the promotion of good science in the establishment of water policy and for funding to support this science. The Center will do the same.

RFP -- NATIONAL COMPETITIVE GRANT PROGRAM

The U.S. Geological Survey, in cooperation with the National Institutes for Water Resources, requests proposals for matching grants to support research on non-point source water pollution, water availability, and water use. For planning purposes, the amount available for research under this program is estimated to be \$1,000,000 in federal funds, though there has not been an FY 2003 appropriation of funds

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for this program as of the date of this Announcement.

Any investigator at an institution of higher learning in Maryland is eligible to apply for a grant through the Maryland Water Resources Research Center.

Proposals involving substantial collaboration between the USGS and university scientists are encouraged, especially on proposals addressing non-point source pollution.

Proposals may be for projects of 1 to 3 years in duration and may request up to \$250,000 in federal funds. Successful applicants must match each dollar of the federal grant with one dollar from non-federal sources.

Proposals must be filed on the Internet at <http://www.niwr.org/> by 5:00 PM, Eastern Standard Time, March 21, 2003. Proposals will then be formally submitted by the Maryland Center

The Government's obligation under this program is contingent upon the availability of appropriated funds.

The Request for Proposals is available at <http://www.niwr.org/>.

Our experience in reviewing these proposals is that they must be regional in scope, involving several scientists from neighboring Universities and local USGS scientists. The Center will be glad to facilitate coordination of any strong collaborative venture.

MID-ATLANTIC REGIONAL WATER POLICY CONFERENCE PLANNED

The Center, in collaboration with the College of Agriculture and Natural Resources, is

APPROPRIATIONS UPDATE

As we go to press, it looks as though the Federal FY03 appropriation for the Water Institutes may soon be passed. We will announce our funded projects for the year as soon as we have official information.

exploring the feasibility of convening a fall conference on the need for a regional water policy. The focus would be on the development of long term water policy to address some of the problems currently being faced in the Mid-Atlantic region, including drought, urban sprawl and related problems. A preliminary meeting has suggested that the University has a broad base of expertise in many facets of water science and policy. Comments about such a conference are welcome.

WATER RESOURCES COLLOQUIUM WAS SUCCESS

The Maryland Water Resources Research Center sponsored a colloquium on *Water Resources Research in Maryland: Highlights and Needs* on Friday, October 25, 2002 in the Baltimore Room, Stamp Student Union. About 65 participants representing a broad spectrum of water expertise attended the meeting. Throughout the day research highlights and needs were shared by State and Federal Agencies and University scientists. The Center hopes to build stronger ties between these major contributors to water science in the State.

Opening remarks were made by Dr. Greg Baecher, Chair, Department of Civil and Environmental Engineering and Dr. Scott Angle, Associate Dean, Maryland Agricultural Experiment Station. Dr. Baecher chaired the morning session.

The morning keynote speaker was Dr. Robert M. Summers, Director, Water Management Administration, Maryland Department of the Environment. Dr. Summers described the duties of his office and addressed some critical water research needs for the state.

The Water Management Administration's mission is to restore and protect the quality of Maryland's surface and ground waters in order to protect the public health and the environment. The Administration includes programs for the control of wastewater discharges, protection of the States water supply, protection of tidal and non-tidal



**Dr. Robert M. Summers,
Maryland Department of
the Environment.**

wetlands and waterways, oversight of State and local government sediment and erosion control and storm water management programs, and the regulation and mitigation of mining activities and abandoned

mines. The Administration also provides technical assistance and financing through grants and loans to local governments for wastewater, water supply, storm water management and environmental restoration projects.

Our Second Speaker was Robert J. Shedlock, Associate District Chief & Supervisory Hydrologist, U.S. Geological Survey. Mr. Shedlock described several of the ongoing research projects at the Baltimore USGS office.

The USGS water resources of Maryland, Delaware, and the District of Columbia consist of numerous streams, springs, lakes, and aquifer systems. Streamflow, ground-water levels, and water-quality data are collected at numerous locations, and water-use data are collected throughout the area. These hydrologic data and other data are used in research and hydrologic studies to describe the quantity, quality, and location of the area's water resources. The collection, analysis, and interpretation of these data is done in cooperation with other federal, state and local agencies, universities, and research centers.

Following Mr. Shedlock was Dr. Margaret A. Palmer, Professor, Department of Biology, University of Maryland. Dr. Palmer discussed her research to understand what controls the

establishment and survival of stream invertebrates. She specifically focused on the relative importance of geomorphic / hydrodynamic factors in predicting invertebrate colonization of new habitats, post-recruitment survival, biodiversity and restoration of ecological processes. Her work also addresses the role of spatial habitat configuration in invertebrate population and community dynamics. Dr. Palmer has a diverse research group in her lab with broad training in the ecology of freshwater systems, fluid dynamics, and hydrology. The research includes field experimentation and laboratory experiments performed on the main campus as well as in her nearby recirculating flume laboratory. Currently she is involved in a nationwide effort on stream restoration



Participants chat during morning break

The next speaker was Patricia Coury, Team Leader, U.S. Army Corps of Engineers, Baltimore District. Ms. Coury directs a number of important Corp water projects, including: Chesapeake Bay Shoreline Erosion (Sediment Behind Dams), Middle Potomac Watershed (water supply emphasis), Chesapeake Bay Oyster Recovery, and Dredged Material Management Plan for the Chesapeake Bay. She presented information on ongoing Corps projects in the Maryland area.

The final morning speaker was Dr. Alba Torrents, Associate Professor, Department of Civil and Environmental Engineering, University of Maryland. Dr. Torrents spoke on her work and other water resources research in the College of Engineering. She is interested in chemical transformations of organic pollutants, environmental fate of toxic chemicals, sorption of organic pollutants, applications of spectroscopic techniques to environmental systems, and wet and dry deposition of POP's onto sensitive ecosystems. Her recent research has included studies on the atmospheric distribution of commonly used pesticides in the Chesapeake Bay watersheds and the fate of endocrine disrupters in water.

Our afternoon keynote speaker was J. Charles Fox, Secretary, Maryland Department of Natural Resources. Secretary Fox provided an overview of the Chesapeake Bay Program, with a focus on nutrient sources and control.



J. Charles Fox, Secretary
Department of Natural
Resources

At the state level, Mr. Fox served as Assistant Secretary and Chief Operating Officer of the Maryland Department of the Environment (MDE). As Maryland's principal environmental regulatory agency, he

directed budgetary realignments and permit streamlining reforms, and initiated establishment of statewide environmental indicators and goals.

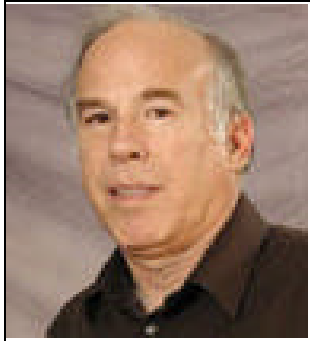
With a 15-year career dedicated to protecting the earth's living and natural resources, Mr. Fox worked as a consultant or Board member to a number of non-profits including American Rivers, Friends of the Earth, the

Environmental Policy Institute, the Nature Conservancy, the Sierra Club, and Maryland League of Conservation Voters. Most recently, Mr. Fox served as senior policy advisor to the Chesapeake Bay Foundation, where he developed an analysis of the 2000 Chesapeake Bay Agreement, identifying cost projections, policy options and federal opportunities available to support the Agreement's new water quality goals. Secretary Fox spent most of his presentation on the important implications of the Chesapeake Bay Agreement to the State of Maryland.

Our concluding speaker was Dr. Adel Shirmohammadi, Professor, Biological Resources Engineering Department, University of Maryland. Dr. Shirmohammadi covered his research in water resources engineering with interests in hydrographic modeling, nutrient and pesticide leaching, and other nonpoint source pollution efforts. Dr. Shirmohammadi's interests include modeling as a tool to predict movement of pesticides and nutrients from watersheds in response to hydrological events, ground water pollution and how to prevent nutrient movement into the ground and surface water systems. Field and watershed scale monitoring is used to develop and to validate mathematical models for identifying best management practices. His research also involves interfacing nonpoint source pollution models with geographic information systems (GIS) for pollution identification. He also discussed other ongoing water research in the College of Agriculture and Natural Resources.

DR. PHILIP SINGER DISTINGUISHED GUEST LECTURER

Dr. Philip Singer of the University of North Carolina has been selected to present the 2003 *Association of Environmental Engineering and Science Professors'* Lecture. We are pleased that the University of Maryland will be one of his stops on the lecture circuit. This lecture is sponsored by the Water Resources Research Center, the Department of Civil and Environmental Engineering, Howard University, the Johns Hopkins University, the University of



Dr Philip Singer

Maryland, Baltimore County, and the Washington Suburban Sanitary Commission.

Dr. Singer has recently been selected as the first Daniel A. Okun

Distinguished

Professor of Environmental Engineering in the School of Public Health's Department of Environmental Sciences and Engineering.



A prolific scholar, Dr. Singer has published widely in the best journals in his field while directing dozens of contracts and grants from federal, state and private funding agencies throughout his career. He also has received the School's top awards for teaching and career accomplishment: the Edward G. McGavran Award and the Bernard Greenberg Award, respectively. In addition to his teaching duties at Carolina, Singer directed the department's water resources engineering program for 19 years.

The lecture will be presented on Monday, April 28 in Room 3201 J.M. Patterson Hall. All are welcome.

ROSE AWARDED SUMMER RESEARCH GRANT

Colin Rose, a PhD candidate in the Department of Biology has been awarded a Summer Research Grant by the Maryland Water Resources Research Center for his research on following the movement of disease resistant genes in the Maryland oyster population using genetic markers. Disease resistant strains of *Crassostrea virginica*, the eastern oyster, have been bred and are now being released on artificial oyster reefs. Hopefully, DEBY and CROSBreed, two strains that resist infection, will promote recruitment of young oysters in and around the experimental reefs, will pass the genes conferring disease resistance to other generations, and will therefore help oyster populations recover to larger sizes. In addition to genes for disease resistance, the DEBY and CROSBreed oysters will contribute molecular markers to the next generation. These molecular markers will be used to track the reproductive success of the DEBY and CROSBreed oysters; the number of offspring that the strains contribute to the next generation and the distance that their offspring move through the Bay are two parameters that will be tracked using markers. Dr. Matt Hare, Department of Biology, is Colin's faculty advisor.



From left Dr. Matt Hare, Colin Rose and Dr. Allen P. Davis

MOGLEN -- FEATURED SCIENTIST

Dr. Glenn Moglen is a native Marylander, having grown up in nearby Kensington, about 20 minutes from the College Park campus. His first association with the University of Maryland was as a student, earning his BS from the Department of Civil Engineering in 1987, and subsequently a Masters at Colorado State University and a PhD from the Massachusetts Institute of Technology in 1995. After a one year stint at the National Weather Service, Office of Hydrology, he returned to the Department of Civil and Environmental Engineering in 1996.



Dr. Glenn Moglen

Dr. Moglen regularly teaches two undergraduate engineering courses (ENCE 430 -Open Channel Flow and Conveyance Structures; and ENCE 465 - Geographic Information Systems for

Planning and Design Models). He also teaches two graduate engineering courses (ENCE 688R - River Engineering; and ENCE 688Z - Geographic Information Systems for Watershed Analysis). This semester, Dr. Moglen is teaching a brand new course: ENCE 100 – Introduction to Civil and Environmental Engineering.

Dr. Moglen's research centers on examining and quantifying the impacts of urbanization on the hydrologic environment. Dr. Moglen is actively involved in research projects spanning from fundamental hydrologic science to applications of GIS-technology for hydrologic design. He is one of a team of faculty conducting an interdisciplinary study of the historical and projected consequences of land use and climate change in several watersheds near the College Park campus. This work is part of an EPA "Water and Watersheds" grant

that requires research at the interface of physical, biological, and social sciences. For details on this project, please visit this project's website at <http://www.watersheds.umd.edu>.

Dr. Moglen has also become involved in "Smart Growth" research. Along with Dr. Steven Gabriel (also in the Department of Civil and Environmental Engineering) and as a member of the National Center for Smart Growth Research and Education located on the College Park campus (please see <http://www.smartgrowth.umd.edu/> for details on this center) Dr. Moglen interest in Smart Growth has resulted in the submission of several manuscripts and the presentation of many talks focusing on posing Smart Growth as a multi-objective optimization problem.

Dr. Moglen's most applied research has been in the development of a GIS-based software package that aids in the hydrologic analysis and design of hydrologic structures for watersheds located anywhere in the State of Maryland. This software package, GISHydro2000 is a combination of both a statewide database and the tools necessary to delineate and ultimate analyze a watershed's hydrologic characteristics. The database includes topography, land use, and soils information throughout the state and extends into Delaware, Pennsylvania, and West Virginia such that watersheds that drain across the state boundaries from these states can be analyzed. Engineers and scientists use this software by first selecting (see Figure) the quadrangles that span their area of interest and then using GIS-based menu choices and tools to delineate their study watershed, generate watershed characteristics, and estimate peak flows using a range of regression equations developed by the U.S. Geological Survey and alternative equations developed by Dr. Moglen and his colleagues for the Maryland State Highway Administration. The software also provides an easy interface to generate input files to the Natural Resources Conservation Service (NRCS) TR-20 rainfall-runoff program. The Maryland Department of the Environment (MDE) requires the use of GISHydro2000 as the analysis tool for hydrologic studies submitted for their

permitting. For more information on GISHydro2000 or to obtain a copy of this software, please visit the GISHydro2000 web page at <http://www.gishydro.umd.edu>.

CENTER WEBSITE UPGRADES

We continue to provide gradual improvements to the Center website. In addition to some cosmetic upgrades, we have added a capability for "Recent News." We will use this link for announcements of Center and related requests for proposals, information about ongoing water research, awards and accomplishments, and news about water issues in Maryland. The Center has also compiled a master list of seminars and lectures scheduled for the University of Maryland and surrounding areas this Spring. Please visit the site at http://www.cee.umd.edu/water_resources/home.html

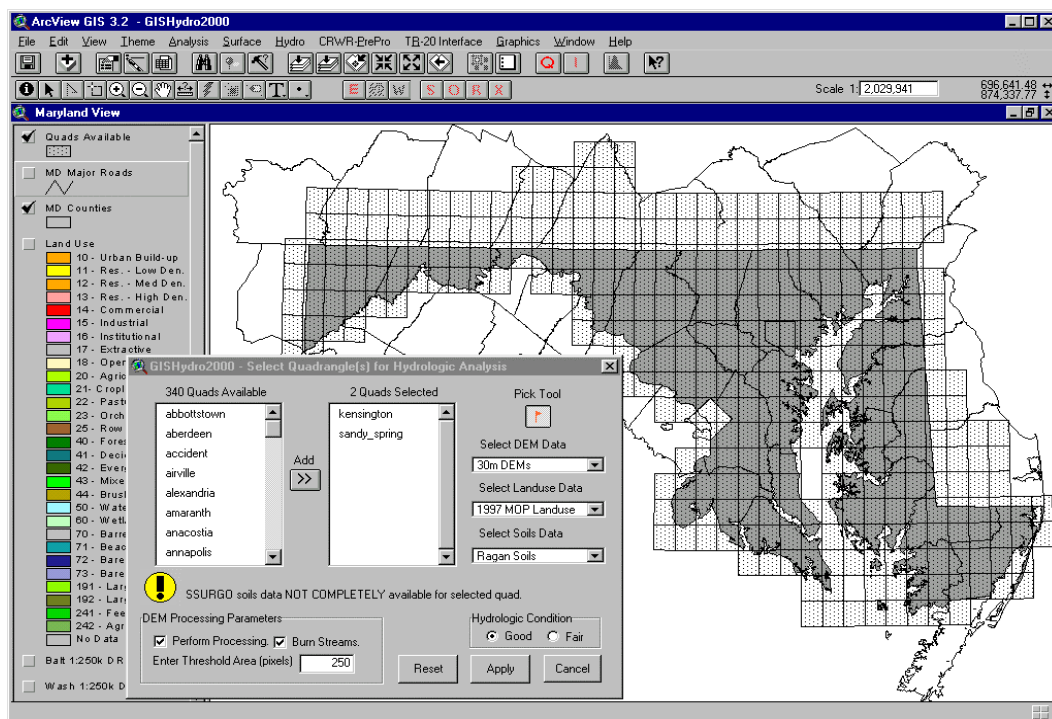


Figure 1. A screen capture of the GISHydro2000 program illustrating the user interface for data selection.

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