
NEWSLETTER

Water Resources Research Center

University of Maryland

February Issue 2002

Allen P. Davis, Director

Phil Kearney, Associate Director

From the Director As I complete my first half-year as Director of the Maryland Water Resources Research Center, let me update you on my perspective as to where we have been and where we are going. The transfer of the Water Center from Chemistry to Civil and Environmental Engineering is essentially complete. It was not entirely smooth, but thanks to the unselfish cooperation of former Center Director George Helz, we resolved most of the transfer problems. Our first round of proposal requests and approvals are complete. The Maryland Center is fortunate in having the cooperation of a large number of outside reviewers from many renowned agencies and institutions. I was very pleased in the professional manner in which these proposals were submitted, reviewed, and processed and I thank all those involved. You can read about the outcome below at [2002 Center Funded Projects](#). Congratulations to Drs. Farquhar and Al-Sheikhly.

As part of an ongoing information gathering initiative, we have begun to survey expertise in water science, beginning with the College Park Campus. Initially, we had a modest list of scientists associated with past activities of the Center; the list has grown to more than 50 scientists and engineers, which we found somewhat surprising, but most certainly encouraging. In the near future, we will expand this survey beyond the College Park campus. You can read more about this endeavor in the [Expertise Survey](#) section. The Center is gearing up to participate at the 4th annual Maryland Day on April 27. We hope to provide information to students and the public about the Center and water resources in Maryland. Finally, I have been working with our Scientific Advisory Panel on how we can raise the visibility and strengthen

the Center on campus and throughout the State. As always, I welcome any input or suggestions from scientists in our greater campus system and our cooperators.

RFP National Competitive Grant Program

The U.S. Geological Survey in cooperation with the Maryland Water Resources Research Center requests proposals for matching grants to support research on non-point source water pollution, water quality sensors, and water use. A total of \$1 million is being made available for research under this program. 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. For information on research priorities, funding eligibility and requirements and the proposal review, selection, and award process, please refer to the complete RFP.

Section 104(g) of the Water Resources Research Act of 1984 requires that this competitive grant program focus on: "water problems and issues of a regional or interstate nature beyond those of concern only to a single State and which relate to specific program priorities identified jointly by the Secretary (of the Interior) and the (water resources research) institutes." Objectives of this program also include the following:

A. Promote collaboration between the USGS and university scientists in research on significant national and regional water resources issues;

B. Promote the dissemination and application of the results of the research funded under this program; and

C. Assist in the training of scientists in relevant water resource fields. Proposals that include a strong educational component (student support) are encouraged, as are proposals from faculty beginning their careers.

Proposals must be filed by the applicant at (<http://www.niwr.org/NIWR>) by 5:00 PM, Eastern Standard Time, **March 15, 2002** and must be approved and submitted by the Center through which they were submitted to the National Competitive Grants Program not later than 5:00 PM, Eastern Standard Time, **March 22, 2002**.

2002 Center Funded Projects

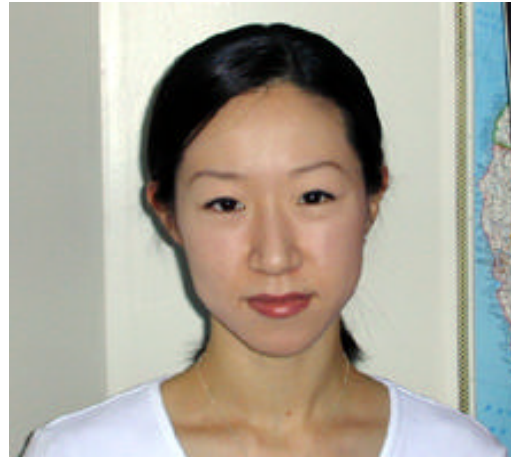
For the coming year, the following new projects were funded: *Investigation of Isotopic Methods for Identifying Atmospheric Deposition of Nitrate to the Chesapeake Bay Watershed*, James Farquhar, Geology; *Advanced Electron Beam Methodologies for Remediation of PCB Contaminates in Chesapeake Bay Sediments*, Mohamad Al-Sheikly, Chemical and Nuclear Engineering, *Summer Research Fellowships*, Center. Projects funded last year and carried over include: *Atmospheric Deposition of Currently Used Pesticides to Chesapeake Bay Watersheds*, Alba Torrents, Civil and Environmental Engineering (CEE), *Sustainable Oil and Grease Removal from Stormwater Runoff Hotspots using Bioretention*, Eric Seagren & Allen Davis, CEE

Over the next several months we will be upgrading our web site at:

http://www.cee.umd.edu/water_resources/home.html

It will include the newsletter, the results of our expertise survey and other items of interest to people interested in or engaged in research on the water sciences

Student Research Award



Eunyong Hong been selected as a winner of a 2002 Student Research award by the Research Committee of the Pennsylvania Water Environment Association (PWEA). Eunyong is a MS candidate in the Department of Civil & Environmental Engineering at College Park. Her research on Sustainable Oil and Grease Removal from Stormwater Runoff Hotspots using Bioretention, is a Center funded project with Drs. Eric Seagren and Allen Davis as co-advisors. She will present a paper at the 74th Annual Conference, being held at the Penn Stater Conference Center in State College, PA, from June 23-26, 2002. The conference registration costs for the student presenter are being paid by PWEA. Eunyong will be awarded with a check for \$300 and an engraved plaque at the conclusion of her presentation. Congratulation to Eunyong!

Expertise Survey

The Center has been conducting a survey of scientists engaged in water science research at College Park. Initially we contacted about forty scientists previously associated with the Center, asking them to identify their areas of expertise and to suggest other scientists not included on the initial list. This list grew rapidly and today we have over fifty names on the list. A list of 18 areas of expertise was developed and each participant was asked to indicate those numbers that covered their area of expertise. When completed we hope to identify those areas where we have greatest

strengths and those Colleges/Departments involved. For those who have not returned their information, we request your assistance in helping us complete this survey. The latest of scientists and their areas of expertise is available on request.

Summer Fellowships

The Maryland Water Resources Research Center will offer 2 graduate fellowships of \$3800 each for the summer of 2002. The 2:1 match will be generated from the within the Center, removing one impediment that may be discouraging applications for our grants. Selection of candidates will be competitive. The motivation for this program is that the Center needs to improve its outreach to a broader spectrum people doing important research relevant to Maryland's water resources.

The Center will give priority to proposals in under-represented areas such as socio-economic studies, policy studies, geography, ecology and so forth. Last year, we funded three students in this manner and the program proved very successful. The three students were from the School of Public Affairs, the Department of Natural Resources and Landscape Architecture, and the Department of Biology.

We will require that all candidates must:

! Have been enrolled in a graduate degree program at the University of Maryland for at least the two semesters preceding the summer in which support is requested.

!Have accumulated at least 15 course credits toward their degree.

! Have a minimum GPA in graduate school of 3.0.

! Submit a short proposal for M.S. or Ph.D. thesis research that relates to the broader mission of the Water Resources Research Center.

! Arrange for a supporting letter from their research advisor.

! Certify that he or she will spend full time during the summer on the research project.

! Agree to provide the Center with a 2-page report at the completion of the summer research.

An announcement of this program will be

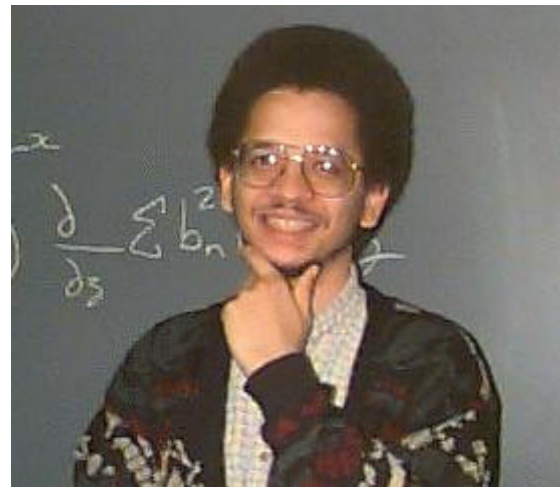
distributed in early March with an application deadline of early April. The announcement will be sent not only to those on our regular mailing list but also to department chairs of departments from which we have never received a proposal. We will be asking the chairs to distribute the announcement directly to their graduate students.

Selection of awardees will be made in mid-April by the Center staff based on

a) evaluations of student's records, b) strength of advisor's recommendation, c) prospects that the research will benefit our understanding and management of Maryland's water resources. The most important benefit of this project will be simply its contribution to the educational mission of the Center.

Interested applicants should contact Dr. A. P. Davis for details by e-mail at apdavis@eng.umd.edu

A Profile of: Hubert J. Montas, Ph.D.



We hope to spotlight young faculty members associated with the Center in this and subsequent newsletters. In this issue we feature Dr. Hubert Montas.

Dr. Montas is of Haitian and French origins, born in Paris and educated in Canada and the U.S. He joined the faculty of the Biological Resources Engineering Department in 1998 after a year visiting at Purdue University. He regularly teaches two undergraduate

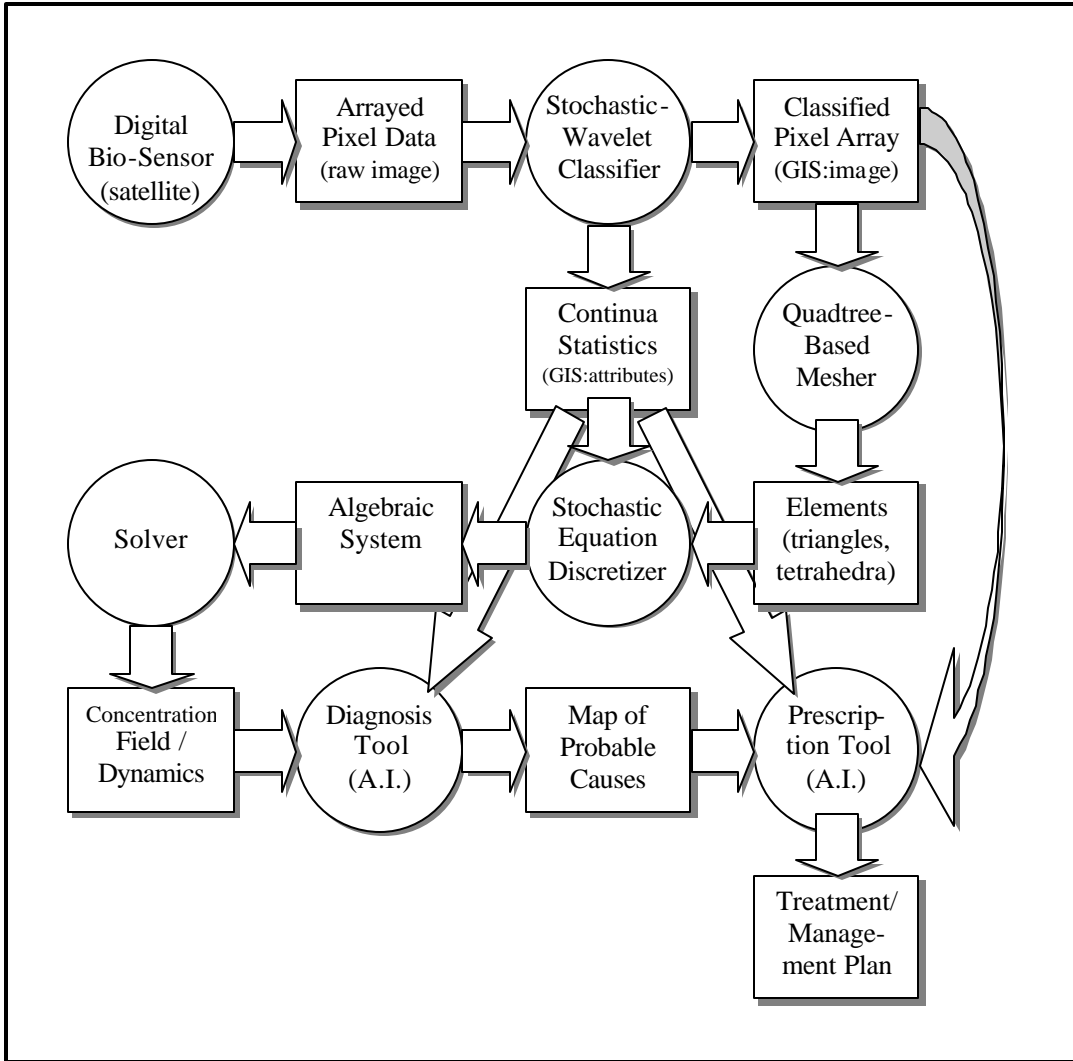


Figure 1: Conceptual Framework for Problem Solving and Spatial Analysis in Bioenvironmental Systems

engineering courses (ENES 100: Introduction to Engineering Design; ENBE 241: Computer Use in BioResources Engineering) and two graduate engineering courses (ENBE 633: Non-point Source Pollution Control; ENBE 643: Advanced Bio-Transport Processes) at the College Park Campus. He also advises several undergraduate students enrolled through the College of Engineering and graduate students seeking advanced degrees.

Dr. Montas's research interest can be broadly described as "Engineering Computation for Biological Resources". The focus is mainly on

taming heterogeneity in bioenvironmental systems with excursions into biomedical, ecological and biotechnological areas. It includes heterogeneity-adapted mesh development for finite element simulation of flow and transport. Classification of arrayed digital data (raster: pixel/voxel) obtained from satellites, ground penetrating radar or nuclear magnetic resonance imaging (NMRI). Stochastic upscaling of transport equations in continuum theories and Artificial Intelligence (AI) for diagnosis and treatment of bioenvironmental problems. Tools being

researched and developed include wavelets, orthogonal polynomials, “macro-quantic” dynamic equations, quadtree/octree data structures, expert systems, neural networks, Geographic Information Systems (GIS) and hydrologic/water quality models. These tools are conceptually integrated in a problem-solving framework for spatially distributed bioenvironments that starts with raw data and eventually results in a treatment or management plan that fosters biosystem health (Figure 1).

Dr. Montas is author or co-author of 6 refereed journal publications, 1 book chapter, more than 30 conference papers and proceedings, and has 4 submissions to Water Resources Research planned for early 2002. His most recent contributions to knowledge are the demonstration of a direct equivalence between stochastic correlation-based transport theories and multi-continuum

approaches to transport modeling in soils and aquifers, and the derivation of an analytical solution for the complex process of third-order advective-reactive-dispersive transport in heterogeneous media. His research work has been recognized by both industry and professional society, and his CAREER proposal on “Engineering Computation in Biological Resources” has just been approved by NSF.

In his youth, Dr. Montas has had the opportunity to travel to Europe, Africa, North America and the Caribbeans. His goal is to become a successful educator and researcher at the University of Maryland and to be able to resume some of these travels. This time, as a worldwide ambassador of computational knowledge and bioenvironmental engineering, ... , or maybe just to soak up some of the sun’s rays!

**Maryland Water Resources Research Center
Civil and Environmental Engineering
University of Maryland
College Park, MD 20742**