OPPORTUNITIES IN EDUCATION

Both M.S. and Ph.D. Degrees are offered. For those with the appropriate background, the M.S. degree can usually be completed in three semesters. Completion of the Ph.D. requirements generally requires six semesters beyond the M.S. degree. For those who lack the appropriate background, completion of prerequisites is required.

Graduate research assistantships (GRAs) are generally available. Awards are made on the basis of merit and can be continued when progress towards the degree requirements are considered acceptable.

Graduate research assistants will engage in state-of-the-art research, which will provide for the opportunity to publish papers in well respected professional journals. M.S.-level GRAs are required to complete a thesis; a non thesis option is available for those not receiving support.

SUGGESTED COURSE OFFERINGS:

411: Environmental Engineering Science
412: Environmental Engineering Unit Operation
431: Hydrologic Engineering
432: Groundwater Hydrology
614: Computer Methods in Engineering
630: Environmental and Water Resources Systems I
634: River Engineering
635: Geographic Information Systems for Watershed Analysis
651: Chemistry of Natural Waters
688: Open Channel Flow
730: Environmental and Water Resources Systems II

OUR GRADUATES GO PLACES!

Recent graduates of our program have gone on to exciting and challenging positions in academia, government, and consulting. The following is a selected list of recent employers of our graduates:

- US Geological Survey
- National Weather Service
- US Environmental Protection Agency
- ...and nationally prominent universities and engineering consulting firms

For more information, see

http://www.cee.umd.edu

For admission materials, see

http://www.gradschool.umd.edu/

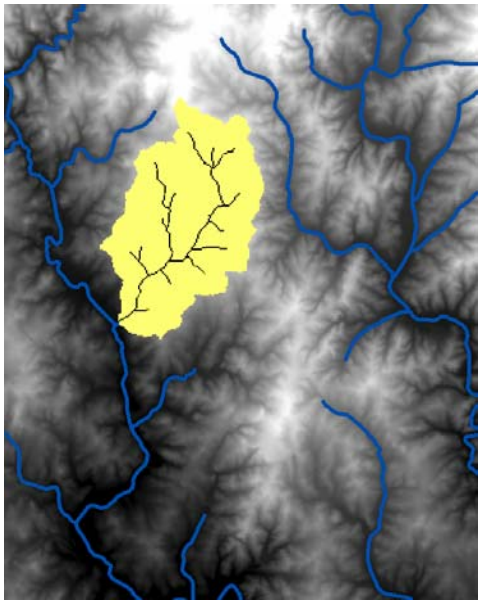
or contact:

Dr. Glenn E. Moglen

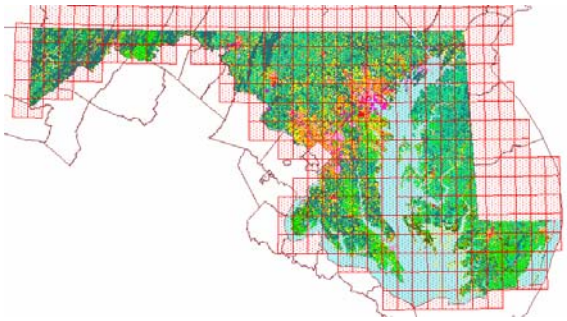
moglen@umd.edu

Program Faculty:

- ***Dr. Kaye Brubaker***, Associate Professor (Ph.D., Massachusetts Institute of Technology)
- ***Dr. Gerald Galloway***, Research Professor (Ph.D., University of North Carolina)
- ***Dr. Richard McCuen***, Professor (Ph.D., Georgia Institute of Technology)
- ***Dr. Glenn Moglen***, Associate Professor (Ph.D., Massachusetts Institute of Technology)
- ***Dr. Yaron Sternberg***, Professor (Ph.D., University of California, Davis)



GIS-BASED HYDROLOGIC ANALYSIS AND MODELING



GRADUATE RESEARCH

AND EDUCATIONAL

OPPORTUNITIES

UNIVERSITY OF MARYLAND

DEPARTMENT OF CIVIL &

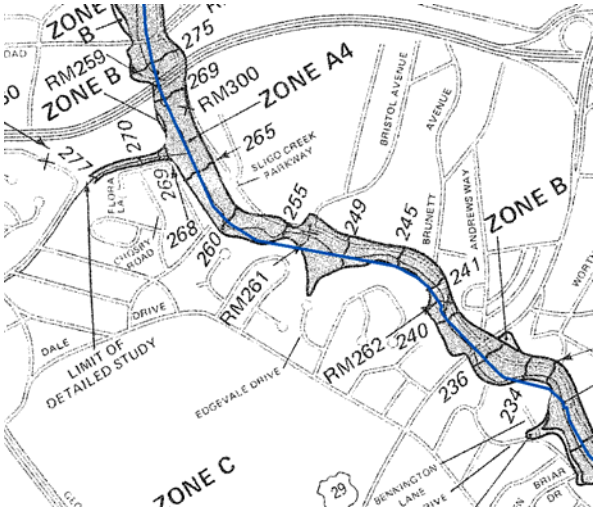
ENVIRONMENTAL ENGINEERING

UNIVERSITY OF MARYLAND

COLLEGE PARK, MD 20742

EMPLOYMENT OPPORTUNITIES

Geographic Information Systems (GIS) have emerged as a powerful and effective tool to aid hydrologic engineers in the analysis of watershed characteristics and in the development of accurate and detailed hydrologic models. A strong background in the fundamentals of hydrology, an acute awareness of the broad range of readily available on-line spatial data, and fluency in the use of GIS represents a unique breadth of knowledge and skills that are in high demand in today's engineering workplace.

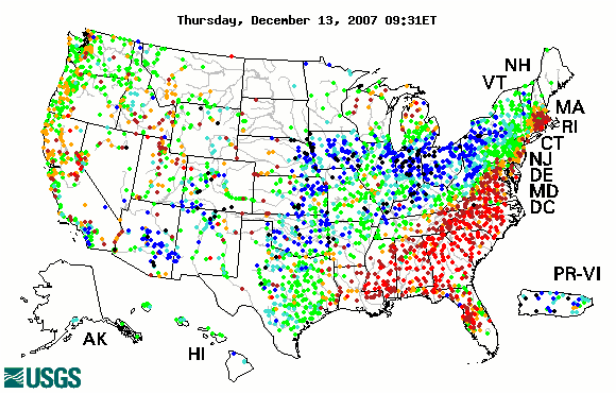


RESEARCH OPPORTUNITIES

Land use change, flood inundation modeling and mapping, digital characterization of the landscape, and spatial variability in vegetation and soil moisture, are just a few concepts that are relevant to hydrologic analysis and modeling and that are readily investigated using GIS technology. Participation in our graduate program at the University of Maryland will likely involve you in some form of research project. Research is personally rewarding and can lead to career paths that benefit society. To illustrate the breadth of possible research projects , the following are a few potential research areas that could form the basis for M.S. theses or Ph.D. dissertations in our program.

Effect of Data Resolution and Source on Hydrologic Estimation

Topographic information is generally represented by digital elevation models (DEMs). As methods and data sources increase, the resolution of these DEMs has generally become smaller. This has consequences on estimation of many fundamental hydrologic quantities: drainage area, flow length, slope, aspect, etc. If hydrologic estimates are sensitive to the data source or resolution, how do we determine the correct answer or quantify the anticipated sensitivity or bias that results from the use of a particular data product or level of data detail?



Digital Estimation of Time of Concentration

Time of concentration is a fundamental hydrologic concept that quantifies the speed of response of a watershed to rainfall. As originally conceived in many hydrologic models, this quantity was estimated from measurements taken directly from a paper-based topographic map. The degree of detail was limited by the paper map and also the degree of motivation of the engineer. GIS makes it possible to estimate the time of concentration at a very fine scale with much more detail than may have been envisioned by those who developed the hydrologic models that require estimates of this quantity. Is it possible that a fixed scale of analysis was embedded in the hydrologic models that are require time of concentration estimates and does higher resolution data result in more accurate measures of this quantity?

Spatial Organization of Land Development for Minimal Hydrologic Impact

The imperviousness contributed by urban development has clear negative impacts on the hydrology of a watershed and on the ecosystems that reside within the stream and watershed. Some research suggests that threshold effects exist such that imperviousness below a given value may have dramatically lower consequences for ecosystem health than above this value. Can GIS be coupled with optimization techniques to prescribe land development strategies that are minimally deleterious to streams and the ecosystems that depend on them?

ABOUT THE UNIVERSITY OF MARYLAND

The University of Maryland, with a stop on the DC subway system, is located just minutes from Washington and is a 30-minute drive from Baltimore. The Chesapeake Bay, mid-Atlantic beaches, and the Appalachian mountains provide numerous outdoor opportunities within 1-2 hours travel by car.

U.S. News and World Report (in 2007) ranked the Clark School of Engineering at the University of Maryland 10th in the nation among public universities. The University carries out over 250 million annually in contract and grant research.

The Department of Civil and Environmental Engineering (CEE) is the second oldest engineering department in the college, celebrating its centennial in 2008. The CEE faculty in Water Resources have a long-standing tradition of scholarly publication, high-quality research, and excellence in teaching.