

PROJECT SUMMARY

IGERT: Water in the Urban Environment

Principal Investigator: Claire Welty

Lead Institution: University of Maryland, Baltimore County (UMBC)

Other Participating Institutions: Institute of Ecosystem Studies, USDA Forest Service, Howard University, University of Maryland Medical School, Chesapeake Biological Lab, Appalachian Lab

Intellectual Merit

Urban development changes the ways that water moves through the landscape, altering the water cycle and increasing flood hazards, channel degradation, and water-quality impairment. These problems have led to successive generations of regulatory policy and engineering measures designed to mitigate negative impacts, with varying degrees of success. The effects on human health and social welfare are complex, and designing effective long-term solutions requires integrated ecological, economic and engineering approaches, as well as innovations in policy-making. We propose an IGERT in Water in the Urban Environment that takes advantage of: (1) the presence at UMBC of the field headquarters of the Baltimore Ecosystem Study (BES), one of only two urban sites in the NSF Long-Term Ecological Research network; (2) the catalyzing influence of UMBC's Center for Urban Environmental Research and Education (CUERE), which works in close collaboration with BES researchers, the U.S. Forest Service, U.S. Geological Survey, EPA, and state and local agencies on water issues; (3) the availability of a group of 32 faculty from nine departments and six partner institutions who are committed to working with graduate students on multidisciplinary urban water research; (4) the presence on campus (beginning Fall 2006) of the 70-person office of the USGS MD-DE-DC Water Science Center; (5) the availability at UMBC of nationally-recognized programs for recruitment and training of academically talented minority students, and our partnership with Historically Black Colleges and Universities; (6) the proximity of Baltimore to Chesapeake Bay, an important coastal ecosystem severely affected by urban land use change.

The IGERT program will be centered on three interwoven themes: (1) urban hydrology and contaminant transport; (2) urban biogeochemical cycles, aquatic ecosystems, and human health; and (3) urban water policy, management, and institutions. New integrative curricula will be offered in Water in the Urban Environment, Research Methods for the Urban Environment, Modeling the Urban Environment, and Spatial Statistics for the Urban Environment, which together with required seminar courses will bring together students from eight Ph.D. degree programs to gain an appreciation of the varied disciplinary viewpoints, terminology, and data sets required to address urban environmental problems. All IGERT Fellows will do internships in either state and federal agencies and research laboratories, nongovernmental organizations, industry or consulting, or teaching to expand their academic and career path horizons. The program will be administered by CUERE and will utilize other NSF-funded programs at UMBC such as the Alliances for Graduate Education and Professoriate (AGEP) program.

Broader Impacts

UMBC, through its Meyerhoff Scholarship Program, is well known for its work with high-achieving minority students in science, engineering, and mathematics. In 2003 UMBC was one of nine universities selected to receive an ADVANCE Institutional Transformation Award from NSF to make profound changes in policies and practices that affect the recruitment, selection, promotion, and transition of women faculty in Science, Technology, Engineering, and Mathematics. UMBC participates in several national efforts aimed at increasing the number of underrepresented minorities who earn graduate degrees, including: McNair Scholars; Leadership Alliance; Project 1000; National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc.; and the National Physical Sciences Consortium. We will recruit underrepresented minority students through the Meyerhoff program and our existing formal partnership with Howard University. Undergraduate research assistants (IGERT paid) will be another source of students for the graduate program.

Keywords: Environmental Sciences, Geosciences