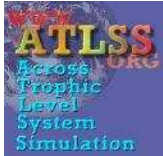# Spring 2005 Special Topics (Jointly offered by the Departments of Computer Science (CS) and Ecology and Evolutionary Biology (EEB))

Computational Science for Natural Resource Management

CS594 Section#28446, EEB504 Section#33827
Meeting Time: Mondays 3:40-5:40,
Place: Claxton 206   2 credit hours

Course Instructors:
Dr. Michael Berry, Professor and Interim Head, CS
Dr. Louis Gross, Professor, EEB and Mathematics
Dr. Dali Wang, Research Assistant Professor

Natural resource management has become a field in which a scientific basis plays a key role in public policy decisions. Policy in areas such as preserve design, harvest management, water flow control, land-use regulation, and control of invasive species all require input from the best available science in conjunction with the public decision process. Technological advances have led to the availability of large data sets, from remote sensing as well as from field and laboratory observations, which serve as a basis for the science of resource management. This general field sometimes is called "EcoInformatics". Computational capability has expanded so that quite complex computer-based models link the biotic and abiotic components of natural systems to potential management decisions.

Course goals are: (1) Provide a survey of computational science for students and practitioners of natural resource management in the context of applications that affect public policy. (2) For computationally-trained attendees, provide an overview of the main approaches used in natural resource management, and how computational science can contribute to this.

Topic coverage includes: data structures and databases for geographic data, including metadata; basic modeling methods for spatial analysis of data; decision support tools including those with explicit spatial components and associated optimization approaches; peer-to-peer computing and applications; grid-computing and applications; linking physical and biotic models of natural systems.

Key case studies to be included in the course are biodiversity modeling, regional landuse simulation and multimodeling for restoration.

Participation in this course requires approval of the instructors. Potential participants with mainly quantitative/computational backgrounds should contact Dr. Berry (berry@cs.utk.edu) while those with mainly biological or natural resource backgrounds should contact Dr. Gross (gross@tiem.utk.edu).

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