GEOGRAPHIC INFORMATION SYSTEMS, REMOTE SENSING AND ENVIRONMENTAL MODELING CONCENTRATION
Students may elect from several specializations within this concentration including Geoprocessing, Biometrics, Environmental Modeling, and Geological Modeling.

WATER RESOURCES CONCENTRATION
The curriculum should include courses in Water Policy and Planning and Hydrological Sciences.

Courses (ERP)
500-3 Physical and Biological Environmental Systems. Application of principles of systems analysis, including chaos and complex adaptive systems, to Earth biogeochemical cycles (e.g. energy, carbon, water, nutrients), inter-relations among them and disruptions to them. Topical focus will vary among: the analysis of how contaminants travel, especially through ground water, and become dispersed in the environment; the origin of soils and the movement of nutrients among plants, water and soils; the origin and distribution of natural resources such as metals and fossil fuels and of natural hazards such as flooding, earthquakes, landslides and volcanism; the global carbon cycle, especially its role in global climate change.

501-3 Economic Systems and Environmental Change. Investigation of the social forces driving natural resource use and environmental change, including population growth, the globalization and migration of economic activity, changing land use patterns, and economic and technological trends in the major resource use sectors; energy, agriculture, water, and forestry. Principles of environmental impact assessment, ecological footprint analysis and industrial ecology are introduced. The challenge of sustainable development sets the stage for an analysis of the future adequacy of the natural resources based on which societies and economies depend. Prerequisite: ERP 500.

502-3 Environmental Decision Making. Analytical concepts relevant for environmental professional will be taught and demonstrated through case studies. Topics to be covered include risk assessment and risk management formulation of environmental impact statements, cost effectiveness and cost benefit analysis, and methods of conflict resolution. The role of economic incentives in encouraging conservation, the role of multiple institutional players in environmental decision-making at various geographic scales (local, state, international, global), and the use of the Internet as a source of environmental information will be emphasized.

510-3 Watershed Policy. Decision-making and collaborative governance of watersheds in a social environment structured by socio-economic opportunities and constraints, ethical considerations, legal and policy issues, and use of computers to aid communication and deliver scientific information (models, GIS, and visualization). Case studies of watershed management will illustrate these concepts. Restricted to: MS and Ph.D. students.

590-1 to 8 Readings in Environmental Resources and Policy. Readings in a specialized topic under the direction of an approved graduate faculty member. Graded S/U only.

597-3 Colloquium in Watershed Science and Policy. Invited speakers from federal, state, or local agencies; nongovernmental organizations; academic institutions; and Watershed Science and Policy faculty will present case studies on the conduct of watershed research and the implementation of watershed policies. Restricted to: IGERT Watershed Science and Policy students only.

598-1 Applied Environmental Resources and Policy. Invited speakers from federal, state, or local agencies; nongovernmental organizations; academic institutions; and Environmental Resources and Policy faculty will present case studies on the conduct of environmental research, the development of environmental laws and regulation, and the implementation of environmental policies. Additionally, students will present dissertation proposals and defend their dissertations. Taken for one credit each year in residence in the Environmental Resources and Policy program. Restricted to enrollment in the Environmental Resources and Policy program.

599-1 to 3 Individual Research in Environmental Resources and Policy. Individual investigation under faculty guidance in environmental resources and policy other than that for the dissertation. Only three hours may be credited toward the degree. Restricted to admission to Environmental Resources and Policy Program.

600-1 to 24 (1 to 12 hours per semester) Dissertation. Research for and writing of the doctoral dissertation. Additionally, students will present dissertation proposals and defend their dissertations. Taken for one credit each year in residence in the Environmental Resources and Policy program. Restricted to enrollment in the Environmental Resources and Policy program.

601-1 Continuing Enrollment. For those graduate students who have not finished their degree and who are in the process of working on their dissertation. The student must have completed a minimum of 24 hours of dissertation research before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded S/U or DEF only.

Finance
(See Business Administration for program description)