

ENVS 4000, Spring (Jan-Apr) 2006

Monitoring Ecosystems

for Environmental Impacts

Humans and human systems depend on ecosystems for food, materials, energy, purification, enjoyment, a sense of place, and other benefits. Ecosystem health has direct and indirect outcomes for human health, economic systems and political stability. Management actions at one scale may result in ecosystem responses at other scales. Traditional natural resource management may fail to detect or measure ecosystem responses that result in loss of resilience, diversity, productivity, and quality, in some cases irreversibly. In addition, ecosystems are subject to perturbations from variable weather, invasive species, global changes, and emerging pathogenic challenges.

Adaptive ecosystem management depends on knowledge of system states and dynamics, and therefore depends on appropriate monitoring. ENVS 4000 (Spring 2006) will include theory and methods of monitoring ecosystems and their components, including populations, communities, geochemical variables, biodiversity, productivity, species of special interest, and marketable outputs. Innovative techniques in biomonitoring, electronic measurement methods, and data analysis will be presented. We will discuss concepts, methods and models for ecosystem monitoring and management, including Environmental Benefit Analysis, Environmental Impact Assessment, Ecological Risk Analysis, Environmental Monitoring and Assessment, and quantitative methods. The second half of the course will consist of student presentations on Monitoring Ecosystems.

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Students who take ENVS 4000 are required to read and discuss scientific papers and reviews, learn and apply quantitative methods of analysis, participate in class, contribute current events news, attend seminars, write short summary papers and critiques, build a topic bibliography, and present well-researched student seminars on the course theme.