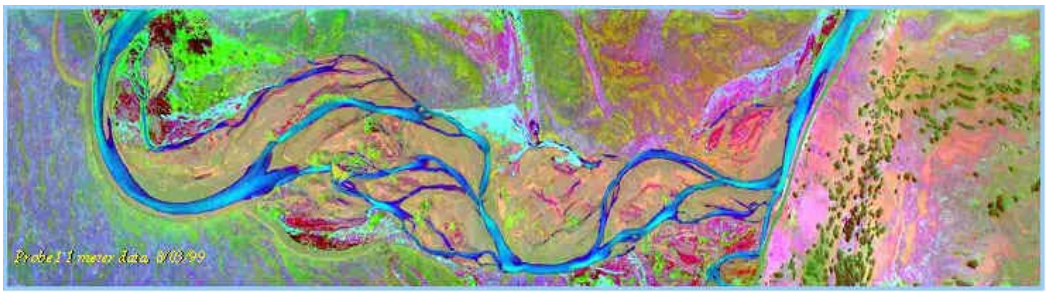

Lamar River, Yellowstone National Park. Processed by W. Andrew Marcus to enhance within-stream variations in microhabitats.

Fundamentals of Remote Sensing

Geography 418/518, Summer 2005

Lecture: Tues and Thurs, 12:00-13:50 McKenzie 123
Lab: Tues and Thurs, 14:00-16:50 McKenzie 442 (SSIL Lab)

Instructor: Eric Sproles (sproles@uoregon.edu)
Office: 202 Condon Hall
Office Hours: Tues and Thurs, 11:00-11:45
Office Phone: 346-5709

Faculty Advisor: Dr. W. Andrew Marcus

This course introduces you to remote sensing with digital imagery. The course will cover:

1. the electromagnetic spectrum, interactions between light and matter (including atmospheric effects) and the resultant electromagnetic signals;
2. the basic concepts and devices used to record electromagnetic signals and their relative advantages and disadvantages;
3. components of a digital image processing, including:
   - sources of image distortion and techniques used for image restoration;
   - techniques for enhancing images to better visualize spectral signals and patterns;
   - the use of digital electromagnetic data for classification, mapping, and monitoring hydrologic and biologic processes and environmental change.

Lectures will cover all of the above topics. Lab sessions will build upon concepts developed in lecture. Labs focus on learning to navigate through the software, on understanding how digital data can be translated into effective visualizations of the environment (image enhancement), on techniques for correcting problems with the imagery (image restoration), and on approaches for land cover mapping with remotely sensed imagery (image classification).

Required Background

To enroll in this class you must have taken introductory GIS or have instructor approval. If you have not taken the intro GIS class or equivalent GIS experience, you should withdraw from this class.

Grading

Undergraduate	Portion of Grade
Quiz 1	15%
Quiz 2	15%
Lab Exercises	60%
Participation and attendance	10%

Graduate	Portion of Grade
Quiz 1	15%
Quiz 2	15%
Lab Exercises	50%
Graduate Project	10%
Participation and attendance	10%

For grading purposes on the quizzes, undergraduates and graduates will be split into two groups, with the highest grade in each group set as the benchmark. Individuals within 10% of that mark will receive a grade in the A range, individuals 10 to 20% lower than the benchmark will receive a grade in the B range, and so on. If the highest combined test and lab grade in the class is held by an undergraduate, then the undergraduate's top mark will serve as the benchmark grade for the graduate students as well.

The graduate project will consist of ***either*** an annotated bibliography or a project proposal. The project proposal will be the conceptual design of a term or research project. The goal of this project is to apply the skills from the course to a real world question/problem. The annotated bibliography will review research articles on a topic related to your thesis research, have at least 10 references, and follow basic guidelines that I will provide in a separate document.

Labs and Lab Grades

Labs provide practical experience that is typical of what you will encounter on most any remote sensing project. All labs will be done using ERDAS Imagine, the most widely used remote sensing software. Early labs will familiarize you with the basic structure of the software. Later labs will introduce you image enhancement (visualization) techniques, techniques for adding geographical coordinates to images, data transformation approaches to extract specific types of information, and classification approaches for mapping land cover. Laboratory sessions will be in SSIL.

Labs must be turned in one week after they are assigned -- otherwise you will receive a **ZERO** on the assignment unless you have made prior arrangements. It is essential that you complete the labs because many of them are sequential and build on knowledge you have gained from the previous lab. You are *encouraged* to collaborate on labs with others and help one another out, but do not copy each others' written answers. I expect all answers to be written legibly in complete sentences with all words correctly spelled. Answers which do not meet these criteria will receive zero credit.

Always bring a zip disk to lab and always back up your work at the end of class on your zip. The hard drives at SSIL are periodically cleaned in order to keep enough space available and you may lose you past work if it is not backed up.

Required readings and materials

The required text book for the class is:

Campbell, James B., 2002, *Introduction to remote sensing (3rd edition),* New York, The Guilford Press, 621 p.

There will be additional readings on the Blackboard website.

You must have a zip disk or USB storage device at every lab for recording and backing up digital image data.