# EarthTutor
## An Earth Science Imagery Tutor
### PILOT PROGRAM v1.7

## *Descriptions of Courses Packaged with EarthTutor*

### Oceanography

The oceans and the atmosphere are eternally intertwined in a game of give-and-take. Because these air-sea interactions exert such a profound influence on the Earth's weather and climate patterns, scientists have dubbed the ocean "the global heat engine." In the course you will be introduced to ImageJ tools and functions by analyzing ocean imagery. In the first half of this course, you will study how Sea Surface Temperatures (SSTs) vary geographically and temporally and the implications of these differences. In the second half of the course, you will compare wind, temperature and chlorophyll data in studying the ocean phenomenon of upwelling. Based on materials by Elizabeth Smith, Professor Kevin Arrigo, and Michael Alfultis.

Contains six 45-min labs.

### Global Vegetation

Though we often take the plants and trees around us for granted, almost every aspect of our lives depends upon them. In this course you will study global vegetation with AVHRR imagery. You will learn to construct an NDVI (a vegetation index) image, study how global vegetation changes seasonally, and classify land cover by vegetation type. You will pay close attention to changes in the Brazilian Amazon and the Sahelian Zone in Africa. Based on materials by Ned Horning.

Contains five 45-min labs.

### Natural Disasters

Satellite images play a key role in the scientific observation of natural disasters and are often used for pre-disaster planning and post-disaster management. In the first half of this course you will explore high resolution satellite images of the Mississippi River before and after the devastating floods of 1993 that affected a large portion of the greater Mississippi River Watershed. The lab develops image analysis techniques to map the extent, distribution, and characteristics of the floods. The second half of this course covers the 1988 wildfires that burned a great deal of the Yellowstone National Park region. You will study pre-fire and post-fire images to map the extent of the burned areas. Two different vegetation indices are calculated from the satellite images to explore the

land cover characteristics of the Yellowstone region before and after the fires occurred. Based on materials by Professor Chris Van de Ven.

Contains two 45-min labs.

## Polar Ices

Antarctica is the coldest place on Earth and also the largest desert. Despite this, particular coastal regions called polynyas are teeming with in life, and in fact, among the most biologically productive habitats in the world. Only recently has satellite technology enabled scientists to observe the entire Antarctic pack ice year round and in all weather conditions. In these labs you will study sea ice concentrations and polynyas using SSM/I, PSSM, SeaWiFS and MODIS imagery. You will also look at the impact of climate and calved icebergs on these biological oases. Based on materials by Professor Kevin Arrigo.

Contains three 45-min labs.