

## Earth Images for Education: Tracking Change Over Time

This CD has been designed to use with the USGS/EDC Earth Images for Education: Tracking Change Over Time image folder and lesson plan. The CD contains information, satellite images, instructional documents in MS Word and Adobe Acrobat PDF format, and software to use in helping students explore land surface changes visible in the four sets of images that are part of this activity.

These resources are also available at: <http://earthscience4kids.cr.usgs.gov>

The Adobe Acrobat reader software can be accessed at:  
<http://www.adobe.com/products/acrobat/readstep2.html>

### Suggestions for Getting Started

1. Teachers and students should begin by reading through ***Tracking Change Over Time: A Classroom Activity***. Look closely at the images and read the background information regarding each set.
2. Teachers should read through ***Tracking Change Over Time: Lesson Plan***. Page one is extensive background information on each image set. Page 2 contains the seven spectral bands in Landsat 7 and a sample image showing example band combinations. Page 3 is a description of the seven spectral bands and includes instructions on how to use MultiSpec. Page 4 contains starter questions to be used with the imagery.
3. How to use the CD:
  - a. Insert in your CD drive and double-click to open.
  - b. Print out the Feature Identification Guide.
  - c. Print out the MultiSpec Worksheet.
4. How to install and use the MultiSpec software:

**Please note: Not all channel/band combinations are available for every image** (*see d.-v.-1. How many channels are available for an image?*).

**Files of type = Multispectral and Open image as = Multispectral type.**

- a. Open the MultiSpec\_Program folder.
- b. Double-click to install the program for your machine (Windows or Macintosh). Keep track of where your computer installs the software.
- c. Double-click the **MultiSpec** icon to launch the software.
- d. Select File, Open Image
  - i. Navigate to the CD, double-click **3\_Imagery**, select the folder by image name and double-click to open.
  - ii. Select an image date and click once.
  - iii. Check that - **Files of types=Multispectral**
  - iv. Check that - **Open image as=Multispectral type**
  - v. Click Open.

#### **1. How many channels are available for an image?**

In the *Set Display Specifications* for window. Select Display, Type=Side by Side Channels. Click OK. Maximize your image screen window. Above the

image will be a number that corresponds to the channels available for that image.

- vi. Changing to a 3-channel combination of the image. At the menu bar at the top of the screen, click on *Processor*. When the drop-down menu appears, click on *Display Image*. Select *Display, Type=3 Channel Color*. In *Channels*, enter your channel numbers and click OK. **Remember - Not all channel combinations are available for every image.**
- vii. You can use the buttons on the menu bar (X1, large/small mountains) to reset the image size, zoom in, or zoom out to see details.
- viii. Repeat steps i – vi to change images and/or channel combinations.

## Explanation of Files on the CD

### 2\_ The MultiSpec program.

The MultiSpec software for both PC and Mac computers. Double click to install the software on your computer. Read the documentation for additional information.

### 3\_ Imagery

Satellite images (identical to those in the *Tracking Change Over Time* Image folder) for use with MultiSpec software. Double click to open the folder.

### 4\_ Movies

Two movies provide background information on Landsat 7, band combinations, and more.

### 6\_ National Standards

National Standards for science and geography as they apply to this activity

### \_Using the CD

A printable, MS Word version of this CD cover and instructions

### 1\_ Feature Identification Guide

Brief users' guide identifying selected features on satellite images using MultiSpec (MS Word)

### 5\_ MultiSpec Worksheet.

Sample worksheets for students to use while working with MultiSpec and the images on this CD and in the *Tracking Change Over Time* image folder( MS Word).

### Feature Identification Guide

This document in Acrobat Reader.

### MultiSpec Worksheet

This document in Acrobat Reader.

### Using the CD

This document in Acrobat Reader.

