Geology of the Cascades Volcanoes: Geology 171B

The southern part of the Cascades Range contains some of the most striking examples of volcanism to be found anywhere in the world. We will see evidence of relatively calm eruptions of basalt lavas that flowed across the landscape forming pahoehoe and aa flows and lava tubes that extend for miles underground. We will see the remains of unimaginable large explosions that caused whole mountains to disappear. You will have the opportunity to understand the causes of these eruptions and their potential for future activity.

This trip will be a rigorous test of your patience and health. There will be several long driving days, and conditions may become harsh. Rain, snow, and extreme cold are serious possibilities. The success of the trip will depend on your amiability and willingness to put up with inclement conditions.

Date: September 19-23, 2013
Leave Thursday, Sept. 19 at 4:00 pm (north side Science Community Center) – Arrange for off-campus parking
Return Monday, Sept. 23 at about 8:00 pm
*Note: you will be missing two days of school. Make arrangements now to make up any missed work.

Cost: $60.00, payable in the MJC Business Office. This fee must be paid prior to the trip in the MJC Business Office (currently on west campus).

Academics: 2 units. Add cards available from Garry Hayes, SCC 336. Space is limited.

Recommended Text: Fire Mountains of the West by Stephen Harris

Academic Requirements:
BEFORE THE TRIP:
• You must attend the following organizational meeting:
  o Thursday, Sept. 12 at 5:30 PM in Science Community Center Room 326
  o Lassen Volcanic National Park
  o Lava Beds National Monument
  o Mount Shasta region (not actually a park)
  o Medicine Lake Highland
  o MacArthur-Burney Falls State Park

DURING THE TRIP:
• You will be expected to take complete lecture notes
• You will be expected to complete the worksheet provided at the beginning of the trip

AFTER THE TRIP:
• Notes and worksheets are to be submitted by Tuesday, October 1
• Final exam on Tuesday, October 1 at 5:30 PM in Science Community Center Room 326
Logistics:
You will be responsible for your own meals for this trip. I strongly recommend getting together with others to save money and space. Keep meals as simple as possible. For breakfast, it is best to use meals requiring only milk or hot water for their preparation. Lunches should consist of snacks that can be eaten all day. Dinners are easiest when they're out of a can! Expect to bring or buy dinner on Thursday evening. You will need 4 dinners, lunches and breakfasts.

It is not possible to get advance reservations for most of our expected campsites. It is possible that we will have to stay in primitive conditions with no facilities if our planned campgrounds are full when we arrive. Please be ready for that possibility. Cold temperatures are highly likely. Snow and cold rain are possibilities. Please be prepared to be comfortable in these conditions. We will be doing some moderate hiking, so please bring adequate walking shoes as well.

No booze, alcohol, drugs allowed at school functions.

Itinerary:

**Thursday, September 19:** (leave at 4:00pm from north side of Science Community Center)
Drive to north end of Sacramento Valley  
Campsite: Woodson Bridge State Park (916) 839-2112

**Friday, Sept. 20:**
Stops: Castle Crags State Park  
       Mt. Shasta  
       Shasta Debris Avalanche  
       Lava Beds National Monument  
Campsite: Lava Beds National Monument Research Center (530) 667-2283

**Saturday, Sept. 21:**
Stops: Lava Beds Petroglyph Point  
       Captain Jack's Stronghold  
       Painted Cave, Valentine Cave, Skull Cave  
Campsite: Lava Beds National Monument Research Center (530) 667-2283

**Sunday, Sept. 22:**
Stops: Medicine Lake Highlands  
       Little Mount Hoffman  
       Tree Molds  
       Jean Dot Ice Caves  
       McArthur-Burney Falls  
       Tentative Campsite: McArthur Burney Falls State Park

**Monday, Sept. 23:**
Stops: Lassen Volcanic National Park  
       Devastated Area  
       Mt. Lassen  
       Bumpass Hell  
       Sulfur Works  
       Brokeoff Mountain  
Return to MJC, approximately 8:00pm
Suggested Equipment

SPACE IS AT A PREMIUM: PLEASE PACK AS COMPACTLY AS POSSIBLE!

**Personal:**

**Warm** Sleeping Bag  
Personal Toilet Kit  
Eating utensils, cup, plate  
**Warm** jacket or coat  
Walking shoes  
Changes of clothes  
Sunglasses  
Sunscreen  
Clipboard, Pen, Pencils

Foam Pad  
Day Pack  
Poncho or rainsuit  
Warm hat  
Gloves or mittens  
Flashlight (bring two)  
Extra batteries  
Toilet Paper  
Paper

**Group:**

Tent  
Cooking utensils  
Stove  
Cleaning supplies  
Ice Chest  
Lantern

**Optional:**

Camera  
Rock hammer  
Pillow and/or extra blanket  
Folding Chair (if room available)

You may wish to bring some extra cash for junk food, maps, books, etc.

**No alcohol, or drugs.**

**Objectives (Student Learning Outcomes):**

By the end of the course, the student will be able to

1. Compare and contrast landscapes formed by mass-wasting, river erosion, glaciation, and volcanism.
2. Recognize the features produced by glacial activity
3. Discuss the role of convergent and divergent tectonic boundaries in the formation of a magmatic arc, and in the construction of mountain ranges such as the Cascades.
4. Distinguish between the major types of igneous plutonic and volcanic rocks.
5. Explain the process by which calderas are formed, and how Medicine Lake caldera developed.
6. Compare and contrast shields, composite cones, cinder cones, plug domes and basalt plateaus, as seen in or near Crater Lake and Lassen Volcanic National Parks, Lava Beds National Monument, and Mt. Shasta.
7. Describe the consequences of interactions between humans and the natural environment at each of the parks we will visit, including the causes and resolution of the Modoc Indian War of 1872-73