

**Lab activity: Alpine and Continental Glaciation**

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## Alpine and Continental Glaciation

### 1. Purpose

This exercise introduces map interpretation of glaciated environments. Two types of glacial environments exist, continental and alpine. Landforms created in these systems can be both erosional and depositional. While similar landforms can be found in both alpine and continental glaciated areas, unique landforms to each environment do exist. Investigating and comparing various glaciated areas a student will be able to begin to interpret what type of topographic expressions various glacial processes create.

### 2. Goals of the Activity/Assignment

- 1) Better understand the relationship between location and geomorphic processes.
- 2) Strengthen and develop map reading skills.
- 3) Strengthen and develop landform analysis skills in comparing various types of landscapes.

### 3. Description of the Activity/Assignment

#### Materials:

- 1) Mount Tom, California Quadrangle (7.5-Minute Series topo).
- 2) Voltaire, North Dakota Quadrangle (7.5-Minute Series topo.).
- 3) Jackson North, Michigan Quadrangle (7.5-Minute Series topo.).
- 4) Blank sheet of 8.5x11 inch paper.
- 5) Graph paper.
- 6) Colored pencils.

#### Assumptions:

- 1) Students have basic map reading skills.
- 2) Students have drawn profiles using topographic maps.
- 3) Instructor has explained basic glacial processes.
- 4) Instructor has introduced students to various glacial landforms.

### 4. Activity

1. On the **Mt. Tom quad., CA**, identify the erosional and depositional features of glacial origin by labeling the features on the attached photo copies. Create a system of symbols or colors for labeling the glacial features. Use arrows to show the flow direction of each glacier.
  - 1.1. Describe the difference in topographic expression of glacial erosion between the area southwest of the mountain range crest (red-dashed line boundary separating INYO and FRESNO Counties) and the area on the east side of the mountain range crest. Explain how and why this difference could have come about.

- 1.2. Although not showing on this map, some of the ephemeral streams draining the east side of the Sierra Nevada disappear, why? What type of material are they disappearing into?
2. Using the **Voltaire quad., ND**, draw a sketch map of the glacial landforms present (use the blank 8.5x11 inch paper).
  - 2.1. Draw a profile along the linear ridge that is just to the southwest of *Stink Lake* (Secs. 14, 23, and 24, T153N, R79W).
  - 2.2. What is the direction of ice movement? Explain your evidence.
  - 2.3. What is the significance of the change in elevation just north of *Erickson Lake* and stretching WNW to ESE along the bottom quarter of the map (paralleling U.S. Route 52)?
3. Using the **Jackson North quad., MI**:
  - 3.1. What type of glacial activity shaped this area? What is your evidence (list the glacial landforms present)?
  - 3.2. What type of drainage pattern exists in this area?
  - 3.3. How do you explain the high concentration of *Gravel Pits* in this area?