Name:

Lab day: Tuesday Wednesday

ENVG/SC 10110L-20110L Planet Earth Laboratory

Laboratory #10 Topographic Maps and Glaciation

Out of: 60 Points

GLACIATION

http://www.nd.edu/~cneal/PhysicalGeo/Lab-Glaciation/index.html **OBJECTIVE**: Recognition of glacial features from topographic maps.

- 1) The topographic map on the next page is a section of Glacier National Park in northwest Montana. "Going to the Sun" road is perched along a cliff. From the road it is still possible to see several glaciers and spectacular erosional features in the valleys below. Note: North is at the top of the page! Note also that where contours are close together, the slope is steep and where they are further apart, the slope is more gentle (this is important for recognizing glacial features).
 - a) Getting your eye in! Look at the area from Iceberg Notch to Mt. Wilbur (see the line on your map). The section starts at "Iceberg Notch" at 8600 feet (just to the left of the "I" in Iceberg, at 8600 feet), and continues across Iceberg Lake to the top of Mt. Wilbur at 9321 feet. You have been given a close up version (at <u>three times</u> the original size) with the section marked.
 - Sketch the cross section of this section on the graph paper provided and exaggerate the horizontal scale by **6 times**. NOTE: Contour Interval (CI) = 80 feet. Vertical scale: one square = 200 feet; start at 5600 feet.
 - <u>This cross section does not have to be exact</u>, **BUT** should show the relevant profile and should be labeled to show where the relevant features on the map are located on the cross section. It should <u>NOT</u> be flat-bottomed. (14 pts)

What glacial feature does this cross section represent? Put the answer on the cross section (2 pts)

What feature does Iceberg Lake represent? Put the answer on the cross section (2 pts)

b) Locate <u>TWO</u> examples of each of the following features of Alpine glaciation on the map provided. Circle and label each feature on the map <u>AND</u> write down the location below. (16 pts) SEE MAP FOR LOCATIONS.

1) a cirque	v) a hanging valley
ii) a horn	vi) a tarn
iii) a U-shaped valley	vii) patternoster lakes
iv) an arête	viii) a col



Iceberg Notch (2.5 times)





2) The following questions are drawn from a geologic map of the glacial deposits in the Midwestern United States (on the next page). It shows the kinds of glacial deposits present at the surface, and so represents the most recent glacial events that have occurred in this area. Two major periods of *continental* glaciation are represented: in green are deposits from the Wisconsinian glacial period, in pink are deposits from the earlier Illinoian age glaciation. Note that the toe (or front) of the glacier shifted back and forth over time.

a) What glacial feature is represented by the dark green, curved bands (1 pt), some of which are named, and how did it form? (2 pts) (3 pts total)

- b) Locate the named, dark-green bands in eastern Indiana. The one in the northeast is labeled *Fort Wayne*, the one in the southwest *Union City* which is older (1 pt), and why? (2 pts) (3 pts total)
- c) What do the yellow areas on the map represent (1 pt) and how did they form? (2 pts) (3 pts total)
- d) Explain why the yellow areas are broad in some locations, such as in central Illinois and northwestern Indiana, and narrow in other places, such as northeastern Illinois and eastern Indiana. (4 pts)
- e) Some of the grayish-blue areas on the map are labeled as lakes but they no longer exist, i.e., Lake Watseka, Lake Maumee, Lake Alma. What happened to these lakes? (explain how and when they came to be and why they disappeared 2 pts) What evidence might there be for their former presence today (cite two pieces of evidence)? (2 pts) (4 pts total)



- 3) The map on the next page represents an area of southern Michigan located in one of the yellow areas in the last map. This is the Jackson area and consists mainly of glacial deposits associated with stagnant (nonmoving) ice. These are mostly deposits from meltwater that flowed on, in, or at the base of ice that later melted away.
 - a) What type of glacial feature are the several lakes (e.g., Mud, Crispell, Skiff, etc.) (1 pt) and how did they form? (2 pts) (3 pts total)
 - b) What type of glacial feature is Blue Ridge (1 pt), and how did it form? (2 pts) (3 pts total)
 - c) What type of glacial feature is Prospect Hill (1 pt), and how did it have form? (2 pts) (3 pts total)

