102 Physical Geology Labs
Chapter 6: Topographic Maps

Objectives: By the end of this lab you should be able to:

1. Use map symbols and latitude/longitude to locate features on topographic maps,
2. Interpret map scales (*fractional, verbal, bar*) and convert one scale to another,
3. Construct topographic maps by drawing contour lines based on points of known elevation, and to construct a topographic profile.

→ **Please have all answers checked by your instructor before you leave today!**

Part I. Map scales.

1. On a separate sheet of paper, convert the following scales to verbal scales. *See inside back cover of your lab manual for conversions.* Show your calculations:

a. 1:13,226. One inch to _____ feet.

b. 1:88,000. One inch to _____ mile(s).

c. 1:125,000. One centimeter to _____ kilometers.

Part II. Using the Fond du Lac topographic map, answer the following questions:

- Do problems 1a, 1b, 1c, and 1i

  For question 1i: locate Calumet Harbor

- Do problems 1d (first question only)
- Do problems 1e and 1o and 1m.

  For question 1m: the two features are the main-road intersections in Johnsburg and St. Peter (to nearest 10^{th} mi/km).

- What is elevation?
- What is height and how is it different than elevation?
- Do problems 1h and 1n

  For question 1h: the building is **Taft School** in the SE quarter of the map, due south of the town of St. Peter along highway 23.

  For question 1n: the stream is the South Branch of the Manitowoc River.

- In the SE corner of the map: find the hill located just east of the "R" in FOREST. What is the **elevation** of the top of this hill?
- What is the **height** of that same hill?

Part III. Please correct Parts I & II of the lab using the key provided by your instructor. Once you've corrected your lab, please work on Part IV.

Part IV. Glacial Landforms of Wisconsin.

1. The landscape that you see around Wisconsin was sculpted and shaped by glaciers in the Pleistocene epoch (~2 million-10,000 years ago). The last stage of ice advance, which ended about 10,000 years ago, was marked by south-flowing lobes of ice on the southern margin of a great ice sheet. Two of these lobes carved out the Lake Michigan Basin and the Fox River Valley. Imagine glacial ice more than a mile thick sitting over Oshkosh! The glacial ice left behind some distinctive landforms.

On the Fond Du Lac Quadrangle map:

a. Locate the distinctive elongate hills East / northeast of the city of Fond Du Lac. There are some particularly good examples just below the last "H" in the word TAYCHEEDAH in the southern part of section #26 and south one mile into section #35.

   Compare the shape of the hill in the SW corner of this section square #35 to the landforms shown in Figure 10.5, p. 188. What are these asymmetrical hills called? *{see description on lower-middle page 189}* What general direction was the ice flowing that created the hill in the SW corner of section #35?

b. Now examine some of the cone-shaped symmetrical hills in the SE corner of the map (around the Sheboygan River and Forest Cemetery). Again using Figure 10.5 (p. 188) and description on lower left of page 189, what are these symmetrical hills called? How did these symmetrical hills form?

2. For a more regional view, examine Figure 10.10 (pages 198-199).
   a. What are the distinctive dark green bands on this map?

   b. The area around Oshkosh is covered by the medium-gray colored pattern *(unfortunately, this is obscured by the lab manual binding – it is the same as the area to the west of Oshkosh with the words "Area of Fig. 10.11")*. What was the origin of these glacial sediments? How might the origin of these sediments explain why the area around Oshkosh is so **flat**?

Part V. Working with contour map data.

1. Use Figure 6.15 to answer the following:

a. Determine the index contour interval.

b. Determine the contour interval.

c. Give the elevations of Averill Mountain and Little Averill Pond.

d. Determine the gradient/slope (in feet per mile) of the stream that drains from Brousseau Mountain into Little Averill Pond. Use the grid pattern (large black squares) to determine the distance. Note that each grid box is 1 kilometer wide and 1 kilometer tall, and you will have to convert the map distance from kilometers to miles.

Part VI. Constructing a Topographic Profile: Using the **INDEX CONTOURS** on Figure 6.15 (p. 110), draw a topographic profile along the line A-A' using the blank graph in Figure 6.16 (p. 111).