

**Topographic Maps Tutorial**

# Creating Topographic Profiles

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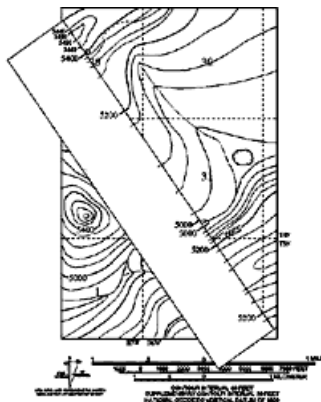
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A very useful exercise for understanding what topographic maps represent is the construction of a topographic profile. A topographic profile is a cross-sectional view along a line drawn through a portion of a topographic map. In other words, if you could slice through a portion of the earth, pull away one half, and look at it from the side, the surface would be a topographic profile. Not only does constructing a topographic profile aid in understanding topographic maps, it is very useful for geologists when analyzing numerous problems.

To construct a topographic profile, you must first decide on a line that is of interest to you. This could be an area where you want to go for a hike and want to know how steep to expect it to be, a line that shows the maximum relief (relief is the difference in elevation between the highest and lowest points) in the map area, or any other area in which you are interested. Once you have determined where you want to draw your profile, use the following guidelines to construct your profile.



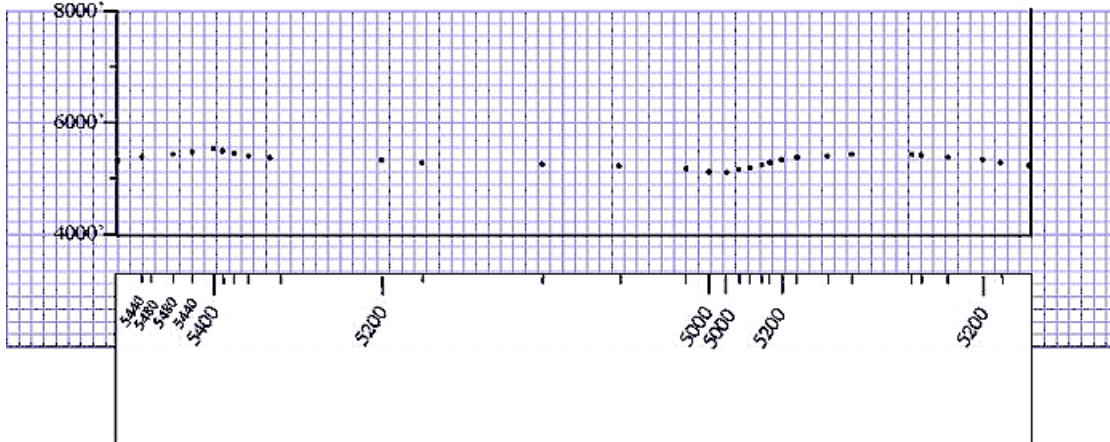
- 1. Pencil the line of your interest in lightly on your map, or you can put mylar over the map and draw on it if you don't wish to mark your map. *\*\*If you use mylar, it may be a good idea to mark the corners of the map on the mylar so you can reorient the mylar on the map later if necessary.\*\**
- 2. Place a blank piece of paper along the line you have drawn. You may want to tape the paper to the map using drafting tape to keep them from moving relative to one another (don't use any other kind of tape unless you don't mind taking some of the map off with the tape later).
- 3. On both the blank paper and the map (or mylar), mark clearly the starting and ending points of your line of section. Below these marks, write down the elevation of the starting and ending points of your section.
- 4. Make a tic mark wherever the paper crosses a contour line on the map, making larger tics for the index contours and smaller tics for the intermediate contours. Write the elevation of the index contours below their tics on your paper...you might want to start off writing the elevation of the intermediate contours as well to avoid confusion, but it will soon become tedious.

Make a note of the highest and lowest points on the profile for use later. Be sure to keep track of the number of intermediate contours between the major contours; if there are more than four intermediate contours it means that there has been a change in slope and you need to check to see if you crossed a hill or a valley.

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- 5. Once you are certain you have all of the appropriate tic marks and elevations, remove your paper from the map. Get a piece of graph paper that is at least as long as your line of section (you can piece them together if you have to, but make sure all the grids line up). If you are using a map with a scale of 1:24,000 you will want to use graph paper that has one inch grids to make your life much easier (because at a scale of 1:24,000, one inch on the paper is equal to 2000 feet). Place your paper with the tic marks on the graph paper (once again, you may want to tape it down) and mark the starting and ending points of your line of section on the graph paper.
- 6. Draw vertical lines above your starting and ending points, these will be the boundaries of your profile. Use the maximum and minimum elevations along your line of section to determine how long to draw these lines. For example, if your minimum elevation is 4320 ft and your maximum elevation is 6280 ft, you will want your vertical line to be at least two inches long. Remember that one inch equals 2000 feet on a 1:24,000 scale map. The difference between 6280 feet and 4320 feet is less than 200 feet, so it would be possible to draw your profile in just one inch. However, it is much easier to construct a profile if your lowest elevation is a multiple of 2000, so you would want to start at 4000 feet and go to 8000 feet (two inches).



- 7. Beginning with your starting elevation, go directly above the tic mark on your paper and make a small dot on the graph paper at the corresponding elevation (if your graph paper has one inch squares divided into tenths, each smaller square will represent 200 feet of elevation change; each index contour should lie along a horizontal grid line). Make a small dot for each tic mark on your paper.
- 8. Connect the dots on the graph paper, and you have a topographic profile.

