

Determining Strike and Dip in Google Earth

In rugged areas where there is substantial outcrop (mountains, deserts) it is possible to determine the area's structural character (strikes, dips, folds) using GIS software, including Google Earth.

To draw a pair of strike lines:

1. Locate a distinct planar feature such as a lithological contact
2. Mouse over the feature noting the elevation values at the bottom of the window. Note the range of elevation over which the surface outcrops (maximum and minimum elevations)
3. Pick an upper contour value near the maximum elevation.
4. Click on the **Add Path** icon at the top of the screen (or select **Path** from the **Add Menu**)
5. Enter the structure contour name in the Pop-Up window (e.g., 5500' Structure Contour)
6. Move the cursor along the contact until the elevation corresponds to the desired elevation for your upper contour (e.g., 5500'). Left click to mark the point.
7. Click **OK** on the bottom of the New Path pop-up window.
8. Move the cursor along the contact until you find a second point at which the elevation corresponds to the desired elevation for your upper contour (e.g., 5500'). Left click to mark the point, and define the structure contour. (Note that if you would like to correct either of the points that you selected, you can left click on the end point and pull it to a new location.)
9. Pick a lower contour value near the minimum elevation.
10. Click on the **Add Path** icon at the top of the screen (or select **Path** from the **Add Menu**)
11. Enter the structure contour name in the Pop-Up window (e.g., 5000' Structure Contour)
12. Move the cursor along the contact until the elevation corresponds to the desired elevation for your lower contour (e.g., 5000'). Left click to mark the point.
13. Move the cursor along the contact until you find a second point at which the elevation corresponds to the desired elevation for your lower contour (e.g., 5000'). Left click to mark the point, and define the structure contour.
14. Click **OK** on the bottom of the New Path pop-up window.

To determine strike direction:

1. Determine the dip direction (direction in which structure contours decrease in elevation), and use the right-hand-rule to determine which end of the structure contour to measure
2. Click on the north arrow in the top right corner of the screen to confirm that the screen view is aligned with north-to-the-top
3. Under the **View Menu**, select **Grid**
4. Use your Douglas protractor to measure the strike direction after aligning the protractor's grid with that of the Google Earth screen

To determine the dip angle:

1. Zoom in on your pair of structure contours, and center them on your screen
2. Click on the **Ruler** icon at the top of the screen (or select **Ruler** from the **Tools Menu**)
3. Center the crosshairs on one structure contour and left click
4. Use the mouse to drag a line toward the second structure contour. When this new line is perpendicular to your structure contours, and the crosshairs are centered on the second contour, then left click with the mouse. (Note that if you would like to correct either of the points that you selected, you can left click on the end point and pull it to a new location.)
5. In the select feet as the unit in the Ruler Pop-Up window and record the value.
6. Use this horizontal distance, and the structure contour interval to calculate the dip angle using trigonometry.

Use the method described on the previous page to determine the strikes and dips of beds at the following locations:

Location	Latitude	Longitude	Strike	Dip
Iran	27.405900	53.355833		
Iran	27.871297	67.182324		
Algeria	32.995419	0.499526		
Algeria	32.640238	-0.847844		
Utah	39.525834	-113.813675		