

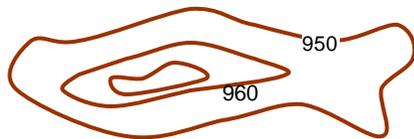
DETERMINING THE BOUNDARIES OF WATERSHEDS USING TOPOGRAPHIC MAPS

Before you begin:

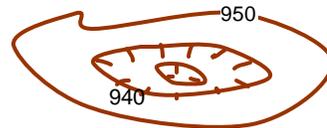
Path of maximum gradient -- the path of steepest slope either uphill or downhill; this path will be seen on the topo. map as having contour lines spaced closest together and running perpendicular to the contour lines.

Path of minimum gradient -- the path of gentlest slope; this path will be seen on the topo. map as having contour lines spaced farthest apart and running perpendicular to the contour lines.

Hilltops are indicated by closed loops of contour lines with no other contour lines inside and no 'depression indicator lines' on the loop.

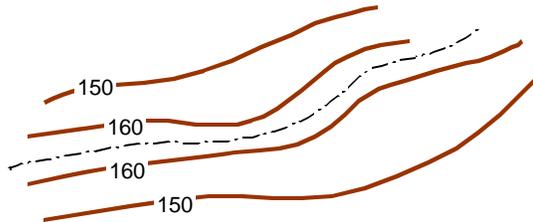


Hilltop

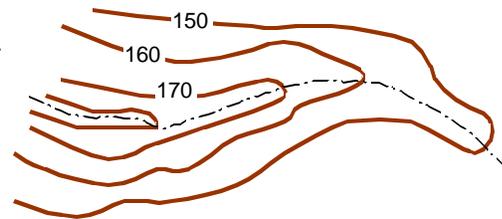


Depression

Ridgelines can be either *Level* or *Sloped*.



Level Ridgeline

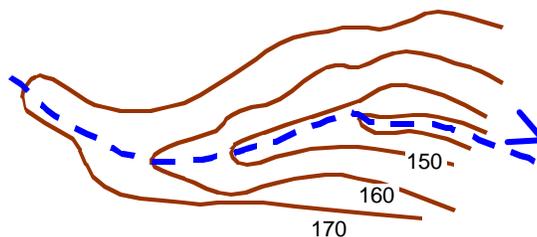


Sloped Ridgeline

The "*Raindrop Test*" is used to determine drainage pathways and the locations of divides.

Simply imagine a raindrop falling on a specific point location. Then, trace its path of running downhill along the path of maximum gradient. If you are trying to check whether or not a line is a divide, perform the raindrop test for two nearby points on either side of the line; if the two raindrops flow in different directions, a divide is present.

Drainage Paths are sloped troughs that form the beginnings of stream beds. They are indicated on topo. maps by "stacked V's" where the open end of the V is pointing towards the direction of flow.



Drainage Path

Watershed Boundaries (continued)

- (1) Find the outlet point of the watershed you are interested in. This point is often a location where streamflow is of interest such as a culvert, bridge, or proposed dam.
- (2) Choosing to move either direction from the outlet, move perpendicularly away from the outlet, uphill, along the path of maximum gradient.
- (3) Continue along the path of maximum gradient uphill until: (a) You reach a point where the path of maximum gradient begins moving downhill, or (b) You reach a point where the terrain suddenly flattens out.
- (4) From this point, identify the closest hilltop or ridgeline that will definitely form part of the watershed's divide. Use the Raindrop Test to decide whether a hilltop or ridgeline forms part of the watershed divide. You may need to compare several points to find the closest one.
- (5) Draw the path of minimum gradient to this next point. Use the Raindrop Test at several locations to check whether or not you have drawn the divide correctly.
- (6) Repeat steps (4) and (5) drawing and checking the watershed divide as you go. The boundary should begin to form a closed loop.
- (7) When the loop is almost complete, begin again at the watershed outlet and move the opposite direction from how you moved in step (2) uphill along the path of maximum gradient.
- (8) Look to connect this path with the loop already drawn.
- (9) Perform the Raindrop Test at several locations along the watershed divide again to check your work.
- (10) Look for drainage paths which may help you check your work.