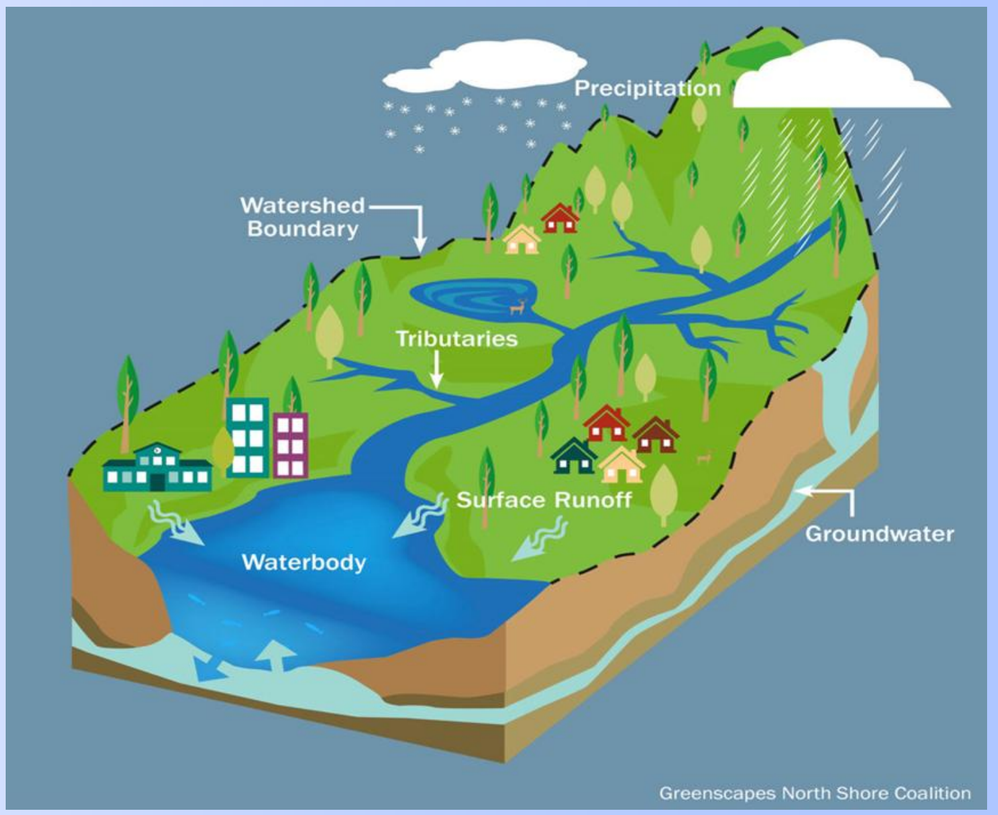
EWC 464 : Advanced GIS and RS in Environment and Water Resources Engineering

WATERSHED DELINEATION

Department of Environmental, Water Resources and Coastal Engineering (EWCE)
Military Institute of Science and Technology

WATERSHED

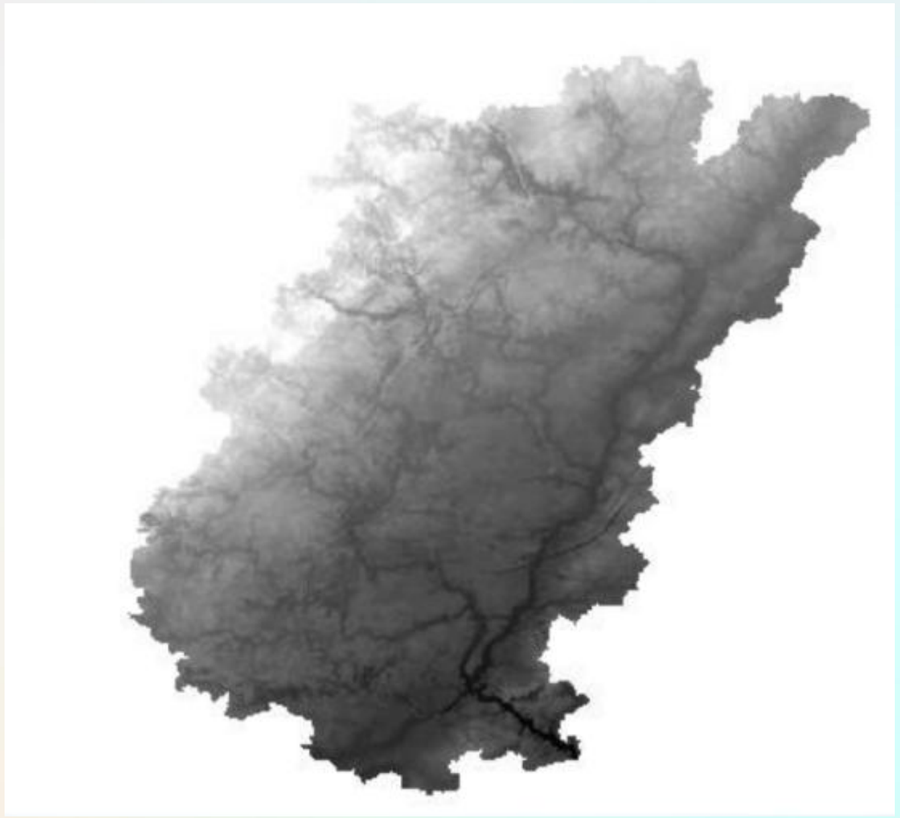
•A watershed is an area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel.



DIGITAL ELEVATION MODEL

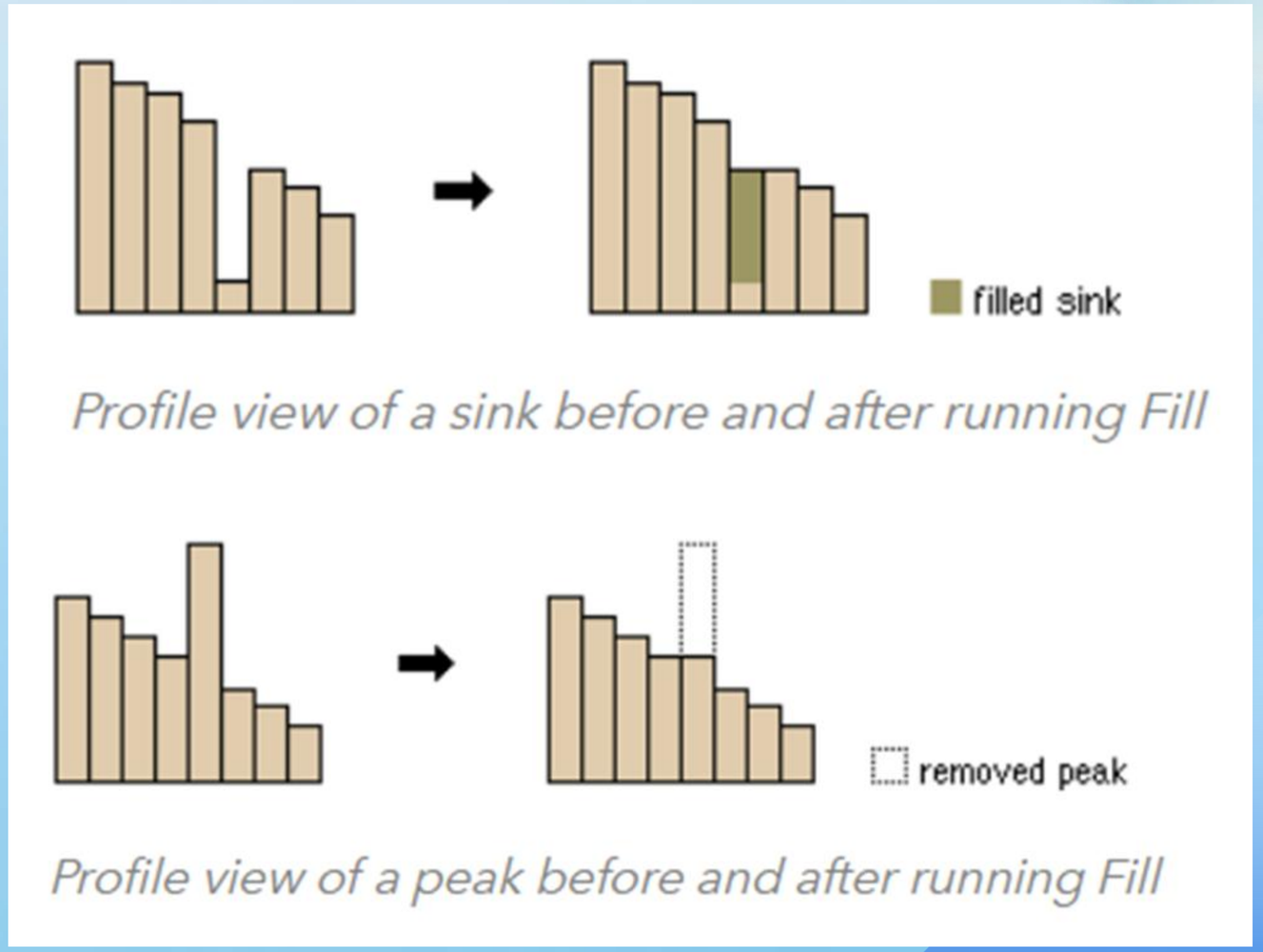
•A digital elevation model (DEM) is a 3D representation of elevation data to represent terrain.

• Digital Elevation Models (DEMs) are raster files with elevation data for each raster cell.



FILL

- The Fill function fills the sinks in a grid.
- If cells with higher elevation surround any cell in a DEM, the flow gets trapped in that cell and cannot go downstream.
- The Fill function modifies the elevation values to eliminate this problem.



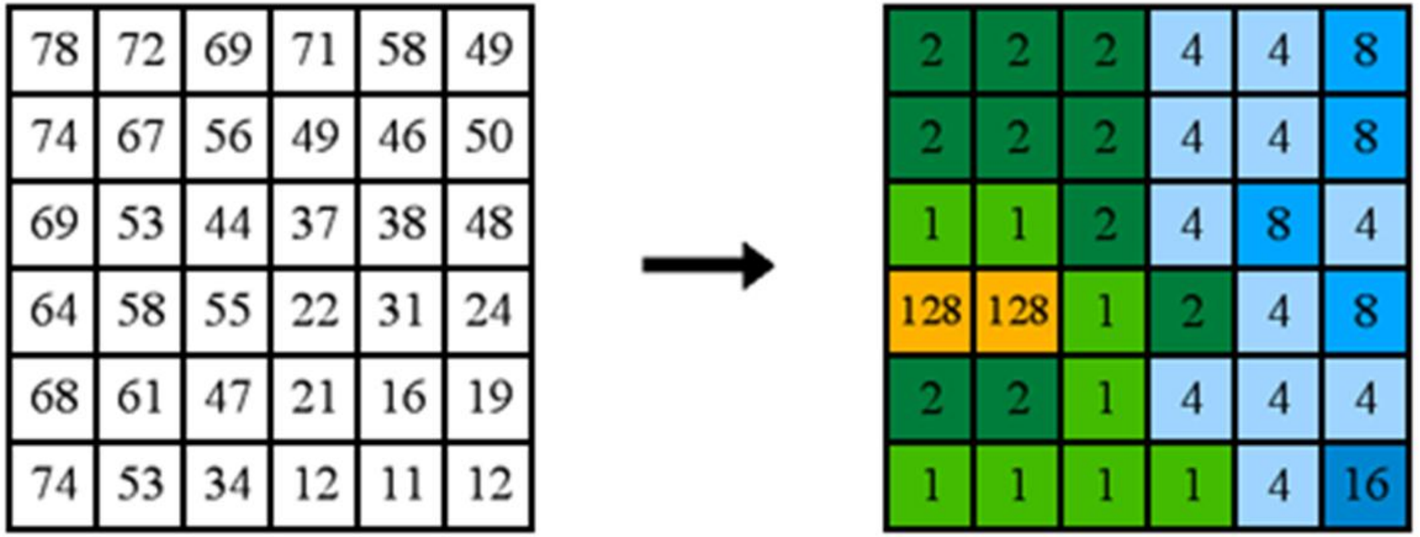
FLOW DIRECTION

- This function computes the flow direction for a given grid.
- The value in any given cell of the flow direction grid indicates the direction of the steepest descent from that cell to one of its neighboring cells using the eight direction pour point (D8) method.

- This is calculated as follows:

  Maximum_Drop = Change in z-value / Distance

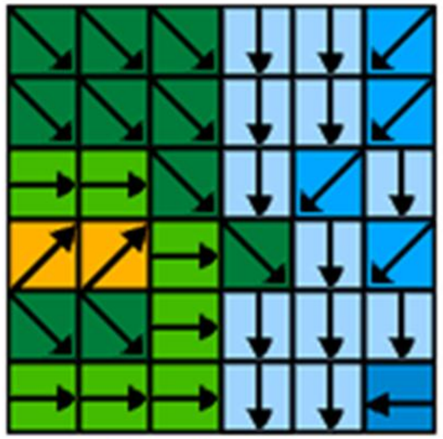
FLOW DIRECTION



The coding of the direction of flow

FLOW ACCUMULATION

•The Flow Accumulation function uses the flow direction grid to compute the accumulated number of cells that are draining to any particular cell in the DEM.



Flow direction

0	0	0	0	0	0
0	1	1	2	2	0
0	3	7	5	4	0
0	0	0	20	0	1
0	0	0	1	24	0
0	2	4	7	35	1

Flow accumulation



Direction coding

Determining the accumulation of flow

STREAM LINK

•This tool assigns a unique number to each link (or segment) in the stream raster.

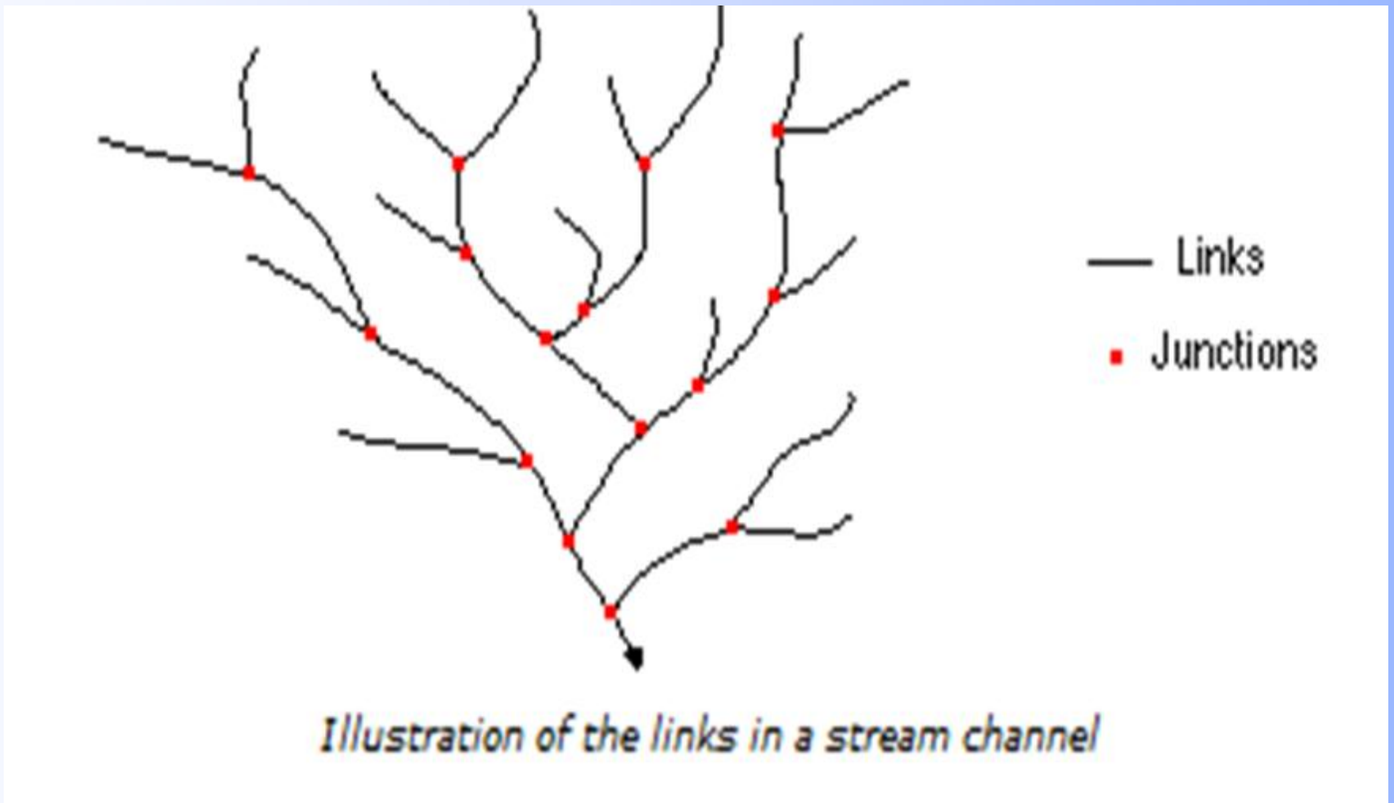
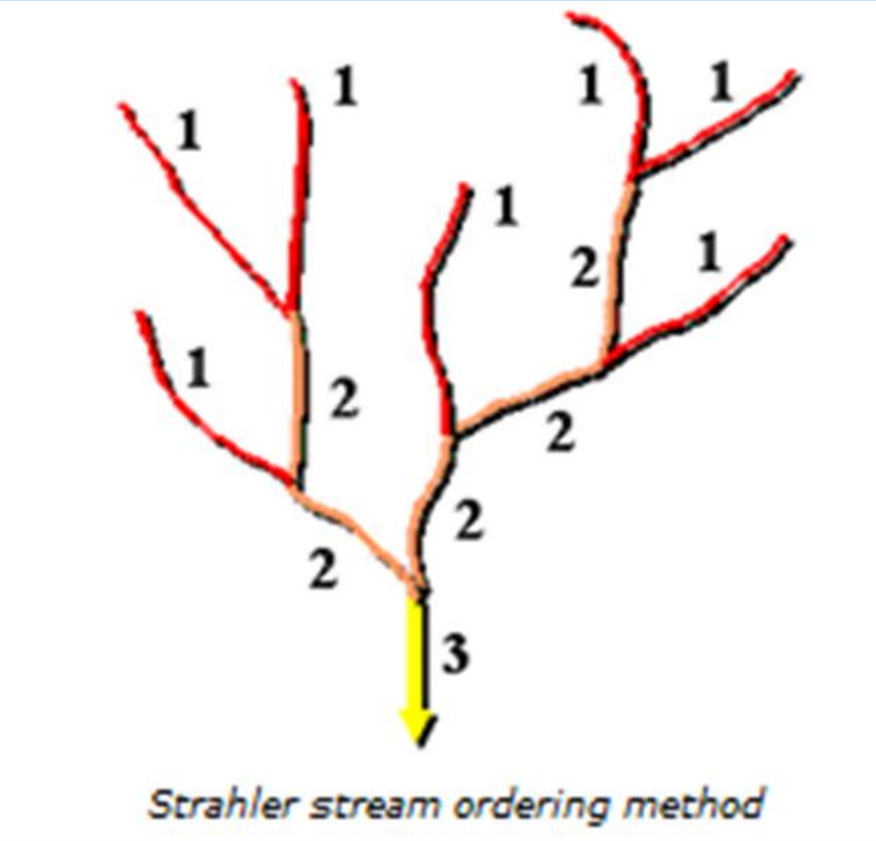


Illustration of the links in a stream channel

STREAM ORDER

- This tool creates stream order for the stream network.



Strahler stream ordering method