

GROUND WATER AND KARST TOPOGRAPHY

Erosional and Depositional Landform By Ground Water

What does Groundwater do?

- The part of rain or snow-melt water which accumulates in the rocks after seeping through the surface is called underground water or simply groundwater.
- The rocks through which water can pass easily are called as permeable rocks while the rocks which do not allow water to pass are called as impermeable rocks.
- After vertically going down to some depth, the water under the ground flows horizontally through the bedding planes, joints or through the materials themselves.
- Although the amount of groundwater varies from place to place, its role in shaping the surface features of the earth is quite important.
- The works of groundwater are mainly seen in rocks like limestone, gypsum or dolomite which are rich in calcium carbonate.

- Any limestone, dolomite or gypsum region showing typical landforms produced by the action of groundwater through the process of solution and deposition is called as **Karst Topography** (Karst region in the Balkans)
- The zones or horizons of permeable and porous rocks which are fully filled with water are called as the **Zones of Saturation**.
- The marks which show the upper surface of these saturated zones of the groundwater are called as the **Water Tables**.
- And these rocks, which are filled with underground water, are called as **aquifers**.
- The water table is generally higher in the areas of high precipitation and also in areas bordering rivers and lakes.
- They also vary according to seasons. On the basis of variability, water tables are of two types: (i) **Permanent water table**, in which the water will never fall below a certain level and wells dug up to this depth provide water in all seasons; (ii) **Temporary water tables**, which are seasonal water tables.
- Springs**: They are the surface outflow of groundwater through an opening in a rock under hydraulic pressure.

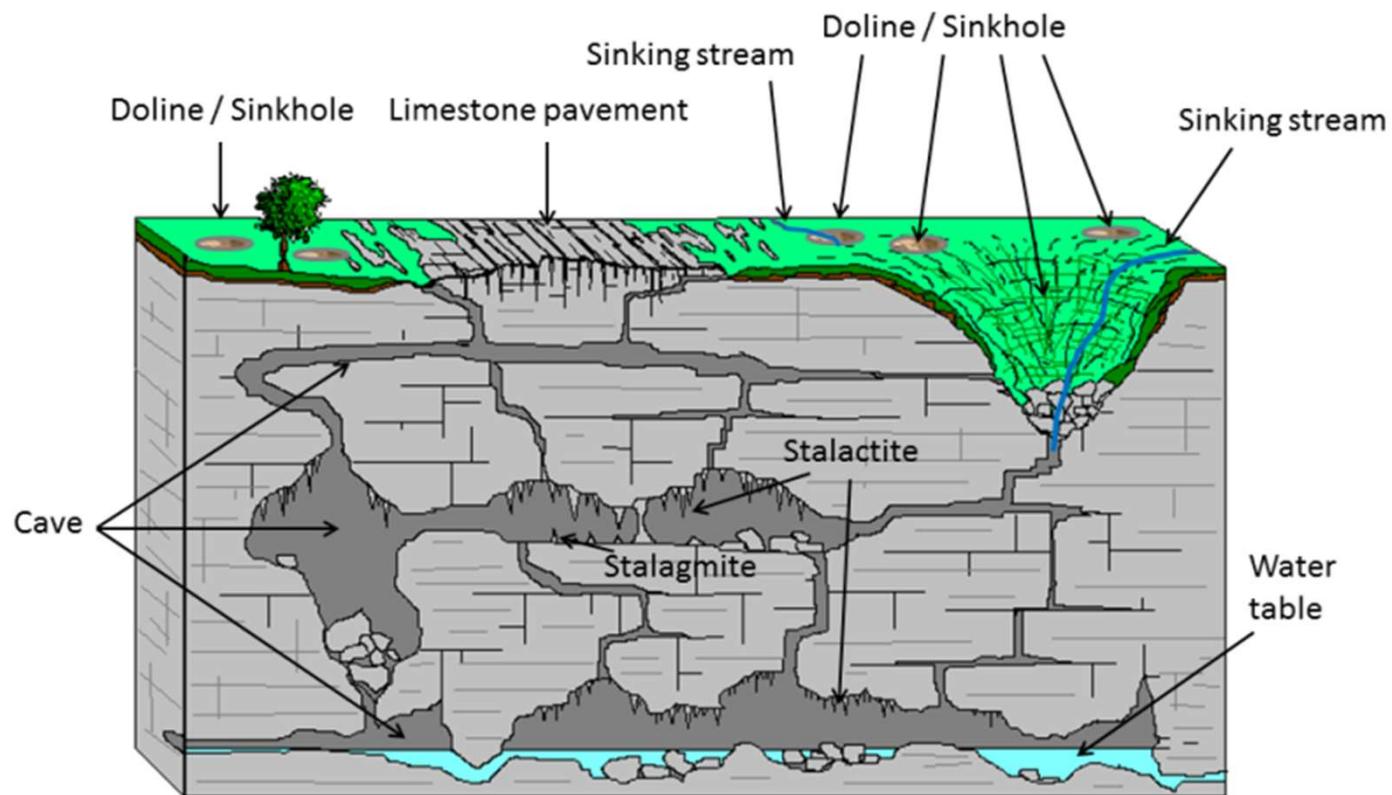
- When such springs emit hot water, they are called as **Hot Springs**. They generally occur in areas of active or recent volcanism.
- When a spring emits hot water and steam in the form of fountains or jets at regular intervals, they are called as geysers.
- In a geyser, the period between two emissions is sometimes regular (Yellowstone National Park of USA is the best example).

Erosional Landforms due to Groundwater

Sinkholes and caves are erosional landforms formed due to the action of ground water.

1. Sinkholes

- Small to medium sized rounded to sub-rounded shallow depressions called swallow holes forms on the surface of rocks like limestone by the action of the solution.
- A sinkhole is an opening more or less circular at the top and funnel-shaped towards the bottom.
- When a sinkhole is formed solely through the process of solution, it is called as a **solution sink**.
- Some sinkhole starts its formation through the solution process but later collapse due to the presence of some caves or hollow beneath it and becomes a bigger sinkhole. These types are called as **collapse sinks**.
- The term **Doline** is sometimes used to refer collapse sinks.
- Solution sinks are more common than collapse sinks.
- When several sink holes join together to form valley of sinks, they are called as valley sinks or **Uvalas**.
- **Lapies** are the irregular grooves and ridges formed when most of the surfaces of limestone are eaten by solution process.



2. Caves

- In the areas where there are alternative beds of rocks (non-soluble) with limestone or dolomite in between or in areas where limestone are dense, massive and occurring as thick beds, cave formation is prominent.
- Caves normally have an opening through which cave streams are discharged
- Caves having an opening at both the ends are called tunnels.

Depositional Landforms of Groundwater

1. Stalactites and stalagmites

- They are formed when the calcium carbonates dissolved in groundwater get deposited once the water evaporates.
- These structures are commonly found in limestone caves.
- Stalactites are calcium carbonate deposits hanging as icicles while Stalagmites are calcium carbonate deposits which rise up from the floor.
- When a stalactite and stalagmite happened to join together, it gives rise to **pillars** or **columns** of different diameters.

