

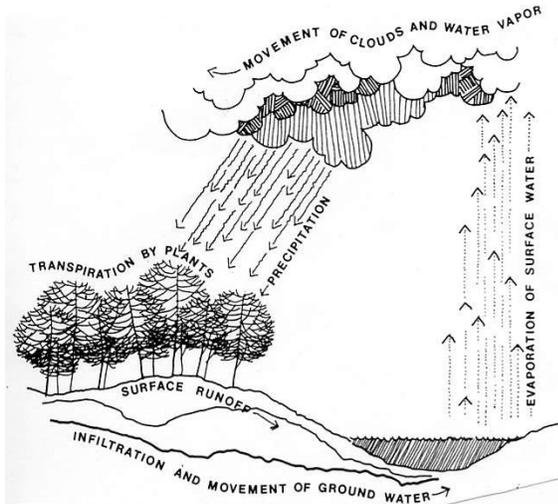


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SPRING 2008 AR 1250 SITE PLANNING

HYDROLOGY

Hydrology refers to the study of the distribution and movement of water through the earth's land and atmosphere.



The Hydrologic cycle (or water cycle)

The Hydrologic Cycle is the general pattern of movement of the water on, under and above the earth.

How it works

Water falls on the land as precipitation, either rain or snow and then it takes three possible paths

- Runoff
• Infiltration
• Evaporation

Runoff is the surface flow of water from an area. From precipitation a small amount of water flows off the land into streams and eventually into the ocean.

Infiltration is the process by which water soaks into the ground. It is also called percolation.

Most of the precipitation is evaporated into the atmosphere directly and also by transpiration (absorption and release of water by plants).

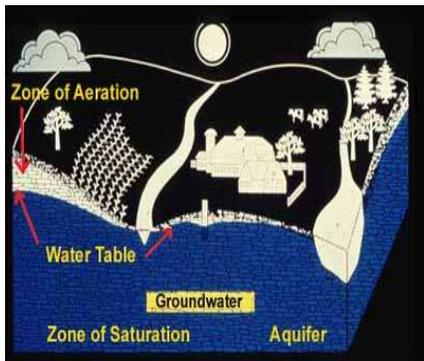
Amount of Runoff

When a site is developed, the amount of runoff increases because:

- removal of vegetation decreases transpiration, increasing saturation of land
• pervious land is replaced by impervious buildings, streets and parking areas, which reduces infiltration

Underground Water

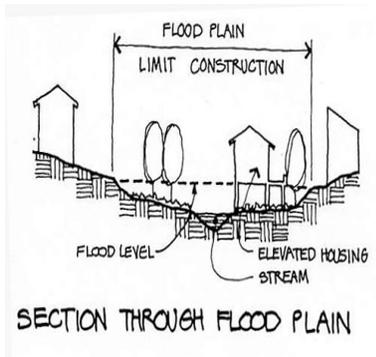
Underground water is the water contained in the voids and crevices under the earth's surface. Underground water greatly exceeds all of the water contained in streams and lakes. Underground water comes from rain or snow which has seeped or infiltrated into the ground. Underground water is found in two zones:



Zone of aeration: the zone below the ground in which the spaces between soil grains contain both water and air.

Zone of saturation: the zone below the ground in which the spaces between soil grains are filled completely with water - also called an Aquifer which is the underground permeable material through which water flows.

The Water Table is the boundary between the zone of aeration and the zone of saturation. This level fluctuates seasonally and with drought and roughly follows the ground surface.



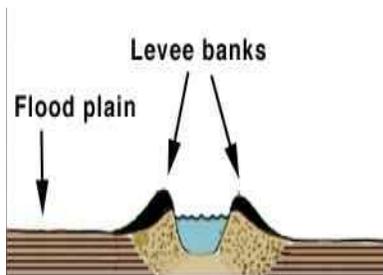
Flood Plain

A flood plain is the relatively flat land surrounding a flowing stream over which water spreads when a flood occurs.

When the flow of water in a river exceeds the river's capacity, the water overflows its banks and spreads over the adjacent land.

Construction of a Levee can hold the water to a higher level

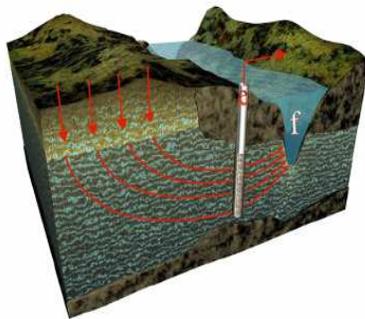
Thus a ten year flood inundates less land than a 100 year flood.



Since the flood plain is subject to natural and recurring floods, it seems obvious that any construction within the flood plain area courts disaster. Therefore such lands should be limited to recreation and agriculture.

A suitable program for a flood plain area would be a park like setting. This is not always possible due to the scarcity and cost of land.

Low density housing is permitted. The houses must be elevated and those living in them must be aware of the danger



Flood Plain - Water Table

The water table in a flood plain usually occurs near the surface, drainage is poor and the soil deep and uniform. The soil is subject to large volumetric changes when it becomes wet making it poor for construction