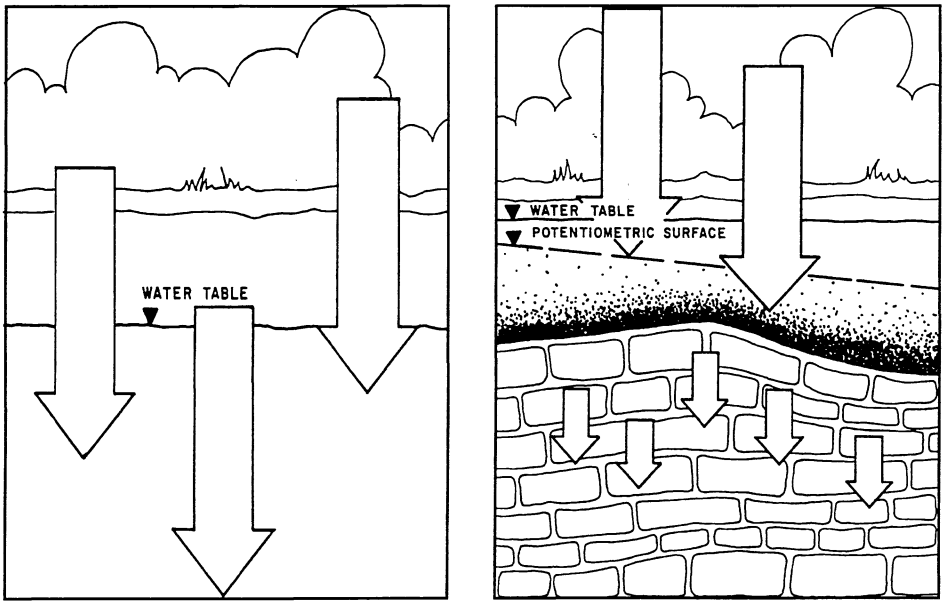

Figure 3. a) unconfined aquifer, and b) confined aquifer.

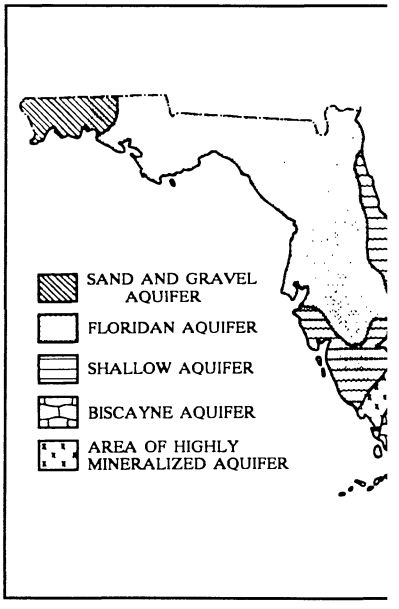

Figure 4. Principal aquifers in Florida

and may be non-existent in the wet season when the water table is at or above the ground surface. In the sandy soils of the Central Florida Ridge however, the vadose zone can extend 100 feet or more. Water in the unsaturated zone is either taken up by plants, evaporated, or drained by gravity into the saturated zone.

In the saturated groundwater zone all pores and crevices are filled with water, and all of the air has been forced out. Water seeping into this zone is called recharge. Groundwater can occur either as an unconfined (phreatic) aquifer, or as a confined (artesian) aquifer as illustrated in Figure 3. In an unconfined aquifer, the water table forms the upper boundary of the aquifer, and the water level in a well will rest at this level. Water infiltrating from the surface has the potential to move rapidly into an unconfined aquifer, thus there is a good chance of contamination from surface activities. In an unconfined aquifer, groundwater moves by gravity from areas of high water table elevation to areas of low water table elevation. Since the water table elevation often follows the surface topography, it can generally be assumed that groundwater moves from areas of high land surface elevation to areas of low land surface elevation.

Confined aquifers are overlain by an impermeable, or semi-permeable confining layer, and are typically under pressure. Therefore the potentiometric surface, or level to which water will rise in a tightly cased well, is above the top of its upper confining layer. When this occurs the well is called an artesian well and the aquifer is said to exist under artesian conditions. In some cases the water level may rise above the land surface, in which case the well is known as a flowing artesian well.

Water in confined aquifers moves from areas of high potentiometric head (as measured by the level to which water will rise in a tightly cased well) to areas of low potentiometric head. Confined aquifers are less susceptible to contamination from local surface activities because infiltrating water typically moves very slowly through the confining layer. However the confining layers may be fractured and missing in many places. Thus, contaminated water may move horizontally on top of the confining layer for some distance before recharging the confined aquifer through a brea in the confining layer.

Major Florida aquifers

Figure 4 is a map of the prin aquifers that yield large quanti of water to wells, streams, lake and springs in Florida. The pri mary source of groundwater for most of the state is the Floridar aquifer. Figure 5 shows the are extent of this formation, which one of the most prolific aquifers the United States. It should be noted however that the Floridai aquifer is generally not usable i regions of the state south of Lal Okeechobee due to its high salt content.

In much of Florida the aquife confined by low permeability sediments of the Hawthorne for tion. The Hawthorne formation absent however in the north cer part of the state along the Ocal Uplift. In this area the aquifer unconfined, and thus receives recharge from water infiltratin from the surface.