SURFICIAL AQUIFER SYSTEM

The surficial aquifer system in Florida includes aquifers present at the land surface. Even though the sand and gravel aquifer and the Biscayne aquifer are present at the land surface and are hydraulically connected to other surficial aquifers in the surficial aquifer system, they are discussed here as separate and distinct aquifers because of their importance as local water sources. Other parts of the surficial aquifer system occur throughout large portions of Florida and adjacent states and are important sources of water in some small municipalities and in rural areas. The surficial aquifer system is primarily used for individual household wells where the Floridan aquifer system is too deep or contains nonpotable water.

The surficial aquifer system consists mostly of sand, sandy clay, silt, clay, sandstone, limestone, and shell beds. Sandstone and limestone units occur primarily in southwestern Florida. In some places the clays are thick enough and continuous enough to divide the surficial aquifer into two or three separate layers, but generally the aquifer is undivided. Thicknesses of the surficial aquifer system vary across the state and range from tens of feet to several hundred feet in Indian River and St. Lucie counties. The surficial aquifer system is as much as 200 feet thick in Martin and Palm Beach counties and 150 feet thick in eastern St. Johns County. Elsewhere in Florida, the surficial aquifer system is generally less than 100 feet thick.

Groundwater in the surficial aquifer system is unconfined by overlying deposits. Water that enters the aquifer is from precipitation. A large amount of precipitation is returned directly to the atmosphere as evapotranspiration and does not enter the aquifer. Some of the water that enters the aquifer moves quickly along short flowpaths and discharges to lakes and streams. In some places, especially near the coast, water leaks upward from the underlying Floridan aquifer system through the clayey confining unit separating the surficial aquifer and the Floridan aquifer system. In other places, leakage occurs downward from the surficial aquifer to the Floridan aquifer system. The general movement of water in the surficial aquifer is illustrated in the idealized diagram representing the aquifers in south central and coastal Florida.

The altitude of the water table in the surficial aquifer system is generally a subdued replica of the land surface. Relatively steep gradients occur from ridges or hills to streams, and low gradients occur in the low, flat areas between streams and under large topographic highs. Arrows on the map show that the general direction of groundwater flow in the surficial aquifer is toward the Atlantic Ocean, the Gulf of Mexico, or toward major rivers. The directions of groundwater movement can change markedly within short distances.
Groundwater Flow
Study Questions

1. What is an unconfined aquifer?
2. Where is the Surficial Aquifer-System most prevalent in Florida?
3. What is the main human use of this aquifer?
4. Because the Surficial Aquifer-System is very shallow it usually takes the shape of the terrain. Look at the map “Water Table Level and Flow.” What do the lines with the numbers attached to them signify?
5. What are these lines called?
6. What is the relationship between these lines and the arrows?