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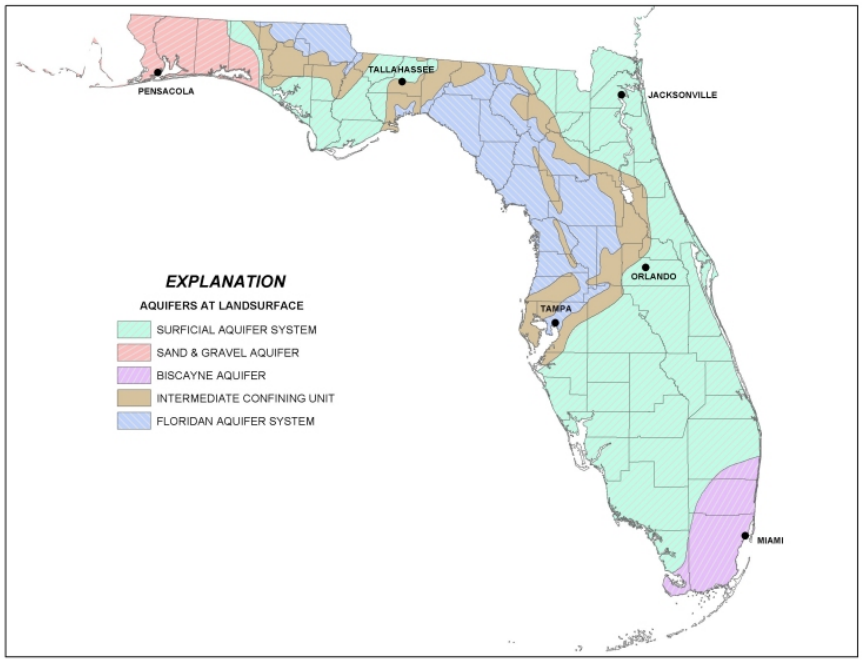
Aquifers

The vast majority of the public water systems in Florida use ground water as their source. There are approximately 12,000 wells associated with ground water systems used for public water supply in Florida. These wells produce water from five major aquifers or aquifer systems.

The major source of ground water supply in Florida is the ***Floridan Aquifer System***, which underlies the entire state. In the far western panhandle and in southern Florida, the Floridan aquifer system is deep, and produces salty and mineralized water. In these areas, the shallower ***Sand-and-Gravel Aquifer*** (in the west) and the ***Biscayne Aquifer*** (in the south) are used for water supply. The ***Surficial Aquifer System*** and the ***Intermediate Aquifer System*** generally produce less water, and, with some exceptions, are used primarily for domestic and smaller public supply wells. Where there are clay layers in the intermediate system, it can serve as a confining unit, slowing the movement of water and, potentially, contaminants from the surface.



Click for Higher Resolution

This map shows where the major aquifers in Florida are found at the land surface. This is where these sources of drinking water are at their most vulnerable.

Floridan Aquifer System

Top

The Floridan aquifer is one of the highest producing aquifers in the world. It is found throughout Florida and extends into the southern portions of Alabama, Georgia, and South Carolina. This aquifer system is comprised of a sequence of limestone and dolomite, which thickens from about 250 feet in Georgia to

about 3000 feet in south Florida. The Floridan aquifer system has been divided into an upper and lower aquifer separated by a unit of lower permeability. The upper Floridan aquifer is the principal source of water supply in most of north and central Florida. In the southern portion of the state, where it is deeper and contains brackish water, the aquifer has been used for the injection of sewage and industrial waste. Groundwater flow is generally from highs near the center of the state towards the coast. The Floridan aquifer is the source of many springs in Florida.

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Sand and Gravel Aquifer

Top

The sand and gravel aquifer is the primary source of water for Santa Rosa and Escambia Counties in the western panhandle of Florida. The aquifer consists of sand and gravel with interbedded layers of silt and clay. The clay layers form local confined conditions within the aquifer. Groundwater flow is generally towards the coast. In Florida, the aquifer contains two high- permeability zones separated by less permeable sands and clays. The lower zone, which is under confined conditions, is referred to as the "main producing zone" because most of the groundwater use is withdrawn from this zone.

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Biscayne Aquifer System

Top

The Biscayne Aquifer is the primary source of water for all of Dade and Broward Counties and the southern portion of Palm Beach County. Water from the Biscayne is also transported by pipeline to the Florida Keys. The aquifer consists of highly permeable limestone and less permeable sand and sandstone. The northern part of the aquifer has more sand and grades northward and westward into the sandy deposits that are part of the surficial aquifer system. In most places, the highly permeable rocks of the Biscayne aquifer are covered by a thin veneer of porous soil and aquifer water levels rise rapidly in response to rainfall. Water in the Biscayne aquifer is unconfined and generally flows toward streams, the ocean and the extensive system of canals in south Florida.

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Surficial Aquifer System

Top

The surficial aquifer system in Florida includes any otherwise undefined aquifers that are present at land surface. Unlike the sand and gravel aquifer and the Biscayne aquifer, which supply water to large municipalities, the surficial aquifer is mainly used for domestic, commercial, or small municipal supplies. The surficial aquifer system is generally under unconfined, or water-table, conditions and is made up of mostly unconsolidated sand, shelly sand, and shell. The aquifer thickness is typically less than 50 feet but can range up to 400 feet in Indian River and St. Lucie Counties. Groundwater in the surficial aquifer generally flows from areas of higher elevation towards the coast or streams where it can discharge as baseflow. Water enters the aquifer from rainfall and exits as baseflow to streams, discharge to the coast, evapotranspiration, and downward recharge to deeper aquifers.

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Intermediate Aquifer System

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In southwestern Florida, aquifers that lie between the surficial aquifer system and the Floridan aquifer system are collectively referred to as the intermediate aquifer system. This aquifer system starts in Hillsborough and Polk counties and extends south through Collier County. The intermediate aquifer system is under confined conditions and is mainly comprised of permeable layers of sand, shell and limestone separated by clay confining units. It is the main source of water supply for Sarasota, Charlotte and Lee counties where the underlying Floridan aquifer contains brackish water. Much of the water pumped from this aquifer system is used for agriculture. In most places, water percolates down from the surficial aquifer system above to the intermediate aquifer system. Lateral flow is generally from a high area in Polk County towards major surface water features and the Gulf of Mexico.

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Accessibility Information

3900 Commonwealth Boulevard M.S. 49 Tallahassee, Florida 32399 850-245-2118 (phone) / 850-245-2128 (fax)