SOUTH CAROLINA'S WATER RESOURCES

Although South Carolina has an abundance of clean, fresh water, it is unevenly distributed in both location and time. Most of the ground water is located in the Coastal Plain, and most of the surface water is located in large, manmade reservoirs on the major rivers in addition to running water in rivers and streams.

Although there is much more water under the ground, surface water is the source for most of the large water supplies in the state because of its convenience and availability. Seventy percent of the state's population relies on surface water, and 30 percent relies on ground water.

HYDROLOGIC SETTING

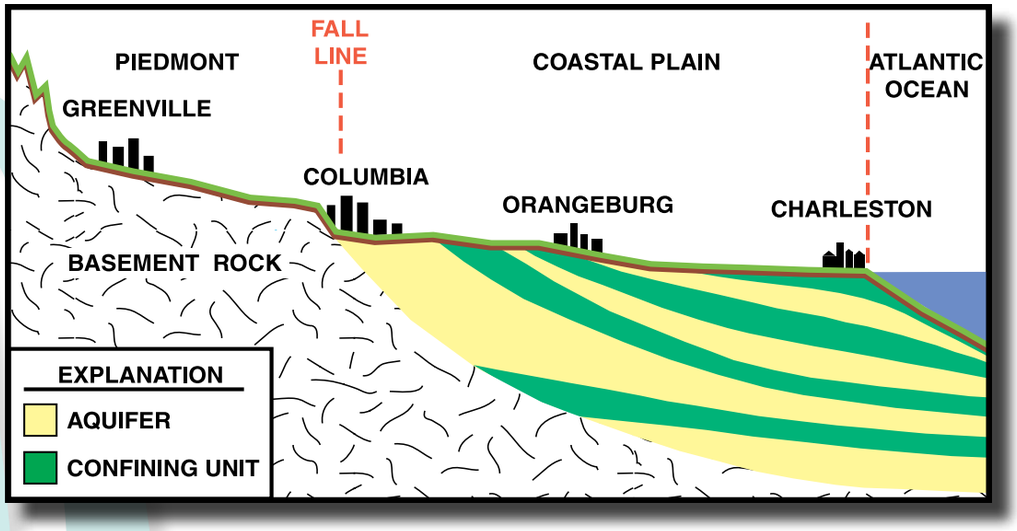
The state's physiographic and climatic settings are key factors that determine the availability and distribution of the state's water resources.

Streams

Streams are the primary means of conveyance of water to the ocean. Water that reaches a stream is generally discharged to the ocean in less than two weeks unless detained by impoundments or diverted for some use. South Carolina contains all or part of four major river basins. The two largest of these basins, the Yadkin-Pee Dee and the Catawba-Santee, encompass about 25 percent and 34 percent, respectively, of South Carolina's area and are shared with North Carolina. The Savannah basin encompasses about 15 percent of the state and is evenly shared with Georgia, with a small area at its northern tip located in North Carolina. The ACE (Ashepoo-Combahee-Edisto) basin, which covers about 26 percent of the state, is the only major basin located entirely within South Carolina.

Lakes

Lakes generally serve as water storage facilities and are usually a part of stream systems. Lakes are constructed for various reasons, such as flood control, water supply, hydropower generation, and recreation. During periods of high streamflow, the storage of water in lakes reduces flooding, and during periods of low streamflow, the release of water stored in lakes can sustain flow of streams downstream.



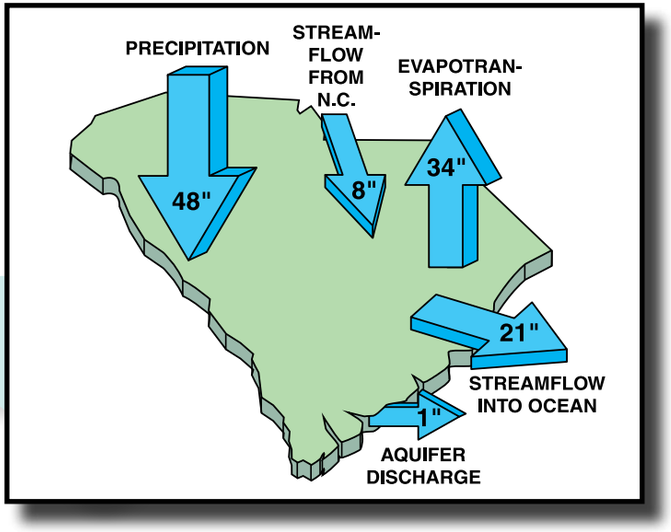
Aquifers

A cross section of South Carolina shows that igneous and metamorphic basement rock underlies the entire state. In the Coastal Plain (the area between the ocean and the Fall Line), this rock is covered with sand, limestone, and clay sediments that reach a thickness greater than 3,000 feet at the coast. Aquifers are sand or limestone zones beneath the surface of the ground that yield water to wells and springs. Aquifers receive water mostly from precipitation in areas where the aquifers are exposed to the surface or covered by permeable sediments, and also in areas where the pressure difference between aquifers is great enough to move water vertically through clay layers (confining units) that normally retard the movement of water between aquifers. Aquifers feed water to streams by seepage and constitute the primary source of water to streams during periods of low precipitation. A large quantity of water is stored in the Coastal Plain aquifers, which serve as a source of water for public supply, commerce, industry, irrigation, livestock, aquaculture, and mining. Wells in these aquifers yield water at rates as great as 3,000 gallons per minute.

The Piedmont region (the area above the Fall Line) lacks the porous sediments that form aquifers in the Coastal Plain. Ground water is stored in fractures in the bedrock and in a soil-like layer of weathered rock called saprolite that rests upon the bedrock. Ground water in the Piedmont is replenished primarily by precipitation seeping into the saprolite and bedrock fractures. The storage capacity of fractures and saprolite is very small compared to that of the Coastal Plain. Wells that penetrate these fractures generally yield some water, but usually less than 10 gallons per minute. During the 1998-2002 record drought hundreds of wells in the Piedmont went dry.

SOUTH CAROLINA'S WATER BUDGET

In a typical year, about 56 inches of water (averaged over the state) comes into South Carolina from all sources. Precipitation is the source of about 48 inches, or 85 percent of the total, and streamflow from North Carolina accounts for the remaining 8 inches. Loss of water from the state occurs primarily through evapotranspiration (the conversion of liquid into vapor by the processes of evaporation and transpiration) and discharge from streams into the ocean. In an average year, 34 inches of water are evapotranspired, 21 inches are discharged into the ocean from streams, and less than 1 inch is discharged into the ocean from aquifers.



References:

General Hydrology of South Carolina, South Carolina Department of Natural Resources, 2001.

South Carolina Water Plan, second edition, South Carolina Department of Natural Resources, 2004.