

WATER PLAN RECOMMENDATIONS
(Summarized from 2004 Plan)
South Carolina Department of Natural Resources
Hydrology Section

GENERAL GUIDELINES

The effective management of South Carolina's water resources is beyond the scope of any one agency or organization and will require cooperation and shared responsibility among Federal, State, and local agencies, as well as public and private parties. Management strategies must be flexible, responsive to trial, monitoring, and feedback, and should change in response to new scientific information and technical knowledge. This "adaptive management" approach provides a process for continually improving management practices and policies. Effective resource management requires the increased utilization of regulatory science. Research institutes and universities should be encouraged to work with State resource agencies to advance regulatory science and become integrated into the decision-making processes of the State.

WATER AVAILABILITY

Consideration must be given to resource management policies that can help maximize water availability. The State, in cooperation with other government and private agencies, should investigate the economic feasibility and overall practicality of these policies. Water availability can be enhanced by withdrawing water in the following order of source preference: (1) streams; (2) lakes; and (3) aquifers.

The effective management of the State's surface water system requires a coordinated management of its lakes and rivers in order to balance the needs of lake users with the needs of river users. To maximize water availability at all times and to protect human and economic needs, surface water use must be regulated. An allocation mechanism must be established to control the distribution of water so that all users have a reliable water supply. Variations in surface water availability and the location of demands must play major roles in the water allocation.

Desired flows and minimum required flows for streams should be established to protect public health and safety, maintain fish and wildlife, and provide recreation and navigation while promoting aesthetic and ecological values. It is the responsibility of the South Carolina Department of Natural Resources (DNR) to determine the minimum flow required to protect the State's aquatic resources. The DNR should evaluate each regulated river in the State to determine the desired flows and minimum required flows just downstream from each reservoir. The State should determine the minimum streamflow needed to maintain ecological functions of estuaries and to prevent saltwater contamination of water-supply intakes.

REGIONAL APPROACH

The State should work to establish a river basin advisory committee for each of its four major basins. Each committee, made up of representatives from Federal, State, and local agencies and stakeholders, would provide a basinwide comprehensive water resources plan to optimize water use throughout that basin. These plans should be approved and adopted by the appropriate Federal, State, and local agencies.

The State should continue to conduct water-quality assessment and protection at the watershed level. It should continue to increase watershed partnerships among government, the private sector, and stakeholders and encourage resource stewardship through education and outreach.

GROUNDWATER

To protect aquifer systems and to ensure the long-term sustainability of the ground water resources, the entire Coastal Plain province should be designated a Capacity Use Area. In areas where water-level declines are or may become troublesome, withdrawals should be restricted in order to minimize further declines and allow ground-water levels to recover. Ground-water levels in the Coastal Plain aquifers should be kept above the trigger levels described in the 1998 South Carolina Water Plan. More studies are needed to refine this water-level index and to establish additional indices for initiating withdrawal restrictions. Resource managers should develop ground water policies—such as mandatory well spacing, or the reservation of certain aquifers for specific uses—to minimize the need for restricting ground-water withdrawals. Withdrawals should be managed so as to minimize their impacts on other users of the aquifer. A study should be made by the State to determine if, and to what extent, subsidence has occurred in the Coastal Plain. Withdrawal rates should be managed so as to prevent land subsidence and sinkholes.

WATER QUALITY

Preventing and reducing water pollution is the collective responsibility of all levels of government, agriculture, industry, landowners, and citizens alike, and it is best achieved at the watershed level, by enhancing stewardship, forging partnerships, and increasing public education and participation. Protecting, improving, and restoring water quality are goals of the State. The State should continue to develop and improve water-quality standards that will meet the goals of South Carolina and the Clean Water Act. Waters that do not meet standards must be restored.

The State should continue efforts to reduce point-source pollution by issuing water-quality based National Pollutant Discharge Elimination System permits. The State should continue to seek additional resources and technology to identify and reduce nonpoint sources of pollution.

Permitted discharges should be adjusted as needed to reflect variability in the assimilative capacity of a river, which will change over time due to the cyclic nature of wet and dry periods. When water is being discharged back into a stream, it should be returned as near to the point of withdrawal as is practical in order to minimize the impact of the withdrawal on the stream between the withdrawal point and the return point.

The State should continue to develop and implement Total Maximum Daily Loads for all waters on the 303(d) list. This includes waters impaired solely or primarily by nonpoint-source pollution. The State should continue to use its authority under Section 401 of the Federal Clean Water Act to ensure that any proposed [reservoir] releases will not result in violations of State water quality standards, nor result in an unacceptable degradation of water quality. The 401 Certification can also be used to require minimum flow releases. The State should investigate the elevated mercury levels found in fish tissue samples.

Source Water Assessments should be used by public water systems to determine what preventive actions are needed to protect drinking-water sources from contamination. The State must remain committed to the protection and restoration of its wetlands and to the concept of no-net-loss of wetlands. Legislation should be enacted to establish a Statewide wetlands protection program.

Withdrawals should be managed so as to prevent degradation of aquifer water quality. Efforts must focus on preventing ground-water contamination as well as treating it. The State should continue to investigate elevated levels of uranium and radium found in some aquifers. Withdrawals from an aquifer should not result in saltwater intrusion. Withdrawals from water-table aquifers should be managed with consideration for the impact these aquifers have on wetlands, surface water, and confined aquifers. Withdrawals should be managed to protect drinking-water supplies obtained from public-supply wells or private domestic wells.

WATER CONSERVATION

Water conservation and improved efficiency of use can have many benefits and should be the first approach for extending or augmenting available supplies. Water should be conserved at all times rather than only as a last resort during times of crisis. South Carolina needs a multifaceted water-conservation campaign with voluntary, incentive, and regulatory mechanisms to address both supply-side and demand-side conservation.

Water planners should consider the implementation of conjunctive strategies—that is, using both surface water and ground water. The combined use of ground water and surface water should be optimized to reduce the effects that withdrawals have on either source and on the environment.

All water supply systems should develop interconnections with neighboring systems, increase storage capacity when needed, and establish aggressive conservation programs.

The State should promote efficient irrigation and agricultural water table management techniques and provide design and operational guidance and, if possible, financial incentives to farmers implementing these practices. Treated municipal wastewater should be recycled for irrigation use on grasslands such as turf farms, pastures, parks, athletic fields, and golf courses.

Water suppliers near the coast should consider the technical and economic feasibility, as well as the ecological impact, of desalination as a source of water.

MONITORING, DATA COLLECTION, AND SCIENTIFIC INVESTIGATIONS

In order to effectively manage the State's water resources, comprehensive and accurate monitoring of water use is needed. Having an adequate number of properly located gages is vital to the effectiveness of the surface-water monitoring network. The State should provide adequate funding to support this monitoring program and to prevent the loss of existing gages.

Ground-water quantity should be monitored throughout South Carolina to determine the effects that withdrawals and droughts have on the State's ground-water resources. In each county, water levels in a minimum of two wells per aquifer should be monitored with automatic data loggers. In those counties where water-level declines are or may become troublesome, or where a single aquifer is heavily utilized, a minimum of three wells per aquifer should be monitored. Water levels in a minimum of one well per county should be monitored in the bedrock aquifers of the Piedmont province. A Statewide water-table monitoring network should be established. Each monitor well should be sited near a drainage divide. Saltwater intrusion should be monitored in aquifers along the entire coast; each major aquifer should have at least two monitor wells.

The DNR and USGS should be given 60 days advance notice of any well that is being considered for abandonment. If deemed important to the State's ground-water monitoring programs, a variance should be granted to keep a well from being permanently plugged.

The State should continue to revise and refine water-quality monitoring programs to address additional potential impacts on water quality from increasing population and development. It should increase analytical capabilities to measure the presence of chemicals at very low concentrations, strengthen monitoring programs that assess biological integrity of water bodies, and improve lake-quality monitoring programs.

Advancing our knowledge of the State's ground water resources must continue with routine data collection, county, regional, and Statewide ground water investigations, and with programs like the surface geophysics and borehole geophysical logging programs. Efforts should be coordinated between DHEC and DNR to ensure that geophysical logs are obtained from all new public-supply wells.

The State, in cooperation with the USGS, should reevaluate the existing hydrogeologic framework and improve it where necessary. New test holes should be drilled in areas that lack substantial subsurface data. A

comprehensive ground-water flow model of the Coastal Plain should be developed and used to predict the effect of future pumping and to determine optimal well spacings. Potentiometric maps of each major aquifer in the State should be constructed at least every 5 years to identify those areas where overpumping is occurring and to determine how ground water levels are changing with time.

RESERVOIRS

Reservoir operations should be planned to ensure adequate instantaneous or average daily flows, rather than average weekly flows. Releases from reservoirs should be conducted in such a way as to mimic natural seasonal fluctuations in streamflow, where appropriate.

During nondrought conditions, reservoirs should be operated so that releases are sufficient to ensure that desired downstream flows are always met. During droughts, the reservoir's drought contingency plan must be enforced. When reservoir water levels are above the first water-shortage severity level, releases from the reservoir should equal or exceed the downstream desired-flow requirements. When lake levels decline to less than the first water-shortage severity level because of low inflow, downstream releases and lake withdrawals should both be reduced, but downstream releases must always meet minimum flow requirements. If the volume of usable storage in a lake is reduced so much because of drought that running out of water becomes a realistic concern—for example, if the volume of usable storage is equivalent to only 100 days of lake withdrawals—downstream releases should be set equal to the inflow into the lake. All regulated lakes must be studied to determine if this 100-day level is an appropriate trigger for this action.

If a drought persists to the extent that the water level nears the bottom of the conservation pool, and the volume of usable storage in the lake is almost exhausted—for example, equivalent to 10 days of lake withdrawals—further reductions in both lake withdrawals and downstream uses should be required. The lake's outflow should be set equal to the lake's inflow minus the newly-reduced lake withdrawals.

The State needs to be involved in the issuing and reissuing of FERC reservoir operating licenses, which offer excellent opportunities to incorporate strategies for managing the entire river system into the reservoir operating plans. Downstream minimum required flows can be achieved by incorporating the appropriate releases into the FERC license, State operating permit, or Corps of Engineers operating plan. It is important that reservoir operating plans detailed in FERC licenses allow for some flexibility in reservoir operations so that resource managers can react to changes in either water availability or demands for water without having to wait for the next relicensing opportunity.

DROUGHTS AND FLOODS

The State should have a drought management and mitigation plan to enhance current drought-related legislation and to help sustain all water uses in the State during water shortages. Water available during dry periods should be allocated among all uses in such a way as to minimize adverse economic, environmental, and health-related problems, but all users within the drought-affected area should share the burden. Economic, social, and environmental impacts should be considered when prioritizing water use.

Drought-contingency plans must be developed by lake owners for all Federally operated, FERC-licensed, or State-permitted lakes. All water suppliers and industries should prepare drought response plans, specifying system-specific triggers or indicators, predrought planning efforts, water reduction schedules, alternate supply sources, and backup systems. These plans should be filed with and approved by the State Drought Response Committee.

Federal and State agencies should improve research programs to increase the accuracy of drought predictions and should improve programs to assist businesses that suffer drought-related losses. Farmers should invest in efficient irrigation systems if adequate surface- or ground-water supplies are available, and they should select varieties of crops that have a high tolerance for dry weather.

During the 1998-2002 drought, many owners of private wells had to deepen their wells or lower their pumps in reaction to water-level declines caused by the drought. No State or Federal assistance was available to help these citizens maintain their water supply. A program should be developed to provide financial assistance to low-income households. Interbasin-transfer permits should allow for restrictions on the volume of transferable water during water shortages in the origin basin.

An important goal of a flood-plain management program should be to preserve natural flood plains, not only by limiting development in those areas but also by allowing flooding to occur. Highly vulnerable structures and critical facilities, as well as large population groups, should be relocated out of flood-hazard areas. New developments should be designed to minimize any flood impact they may have on existing structures. State and Federal governments should encourage and provide incentives for communities that participate in flood-management planning while discouraging behavior likely to result in future loss of property and life. The State should oversee flood-plain and floodway delineation and verify the hydrologic and hydraulic analyses used to make those delineations.

INTERSTATE WATER

Formal mechanisms such as interstate compacts, memoranda of agreement, or protocols should be developed with Georgia and North Carolina to provide equitable water apportionment. Because Georgia and South Carolina share the Savannah River and its lakes, these States must work together to incorporate appropriate release schedules into the Corps of Engineers operating plans for these lakes. State Legislatures should authorize the development of a formal agreement between Georgia and South Carolina to work together to manage the Savannah River basin. South Carolina and Georgia should continue to support the *Savannah River Basin Comprehensive Water Resources Study*, an ongoing cooperative technical project of Georgia, South Carolina, and the Corps of Engineers. State agencies should work with relevant Federal agencies in order to coordinate activities relating to the water resources of the State.