

Water Law Report

January 2004

“When the well is dry, we learn the worth of water”
Benjamin Franklin

Table of Contents

Prefatory Remarks	3
Members of the Committee & Technical Staff	4
A. Introductory Remarks	5
B. Major Water Issues Facing South Carolina	7
1. Interstate Questions	7
2. Saltwater Intrusion	8
3. Existing Law	9
4. Nonriparian Users	9
5. Public Interest	10
6. Public Trust Doctrine	10
7. Successful Negotiations with other States	11
C. Committee Recommendations	12
In-State Issues	
1. New Legislation: To Protect the Public	12
2. New Legislation: To Protect Rivers and Streams	13
3. New Legislation: Surface Water Withdrawal Permits	14
4. New Legislation: To Conform Law to the Current Practice	16
5. New Legislation: Changes to Drought Response Act.....	16
6. New Practices: Water Management	17
7. DHEC Should Use its Clean Water Act Authority in FERC Relicensing	18
Interstate Issues	
8. The Savannah River Basin Compact	19
9. Improved Communications between North and South Carolina Regarding Common Water Resources	26
10. FERC Relicensing Process Is Critically Important to the State of South Carolina	26

Appendices to the Report

A. Executive Order 2003-16	30
B. Savannah River Fact Sheet (prepared by Staff)	32
C. Dr. Robert Becker's Comments on Use Replacement Costing	35

Prefatory Remarks

On June 24, 2003, Governor Sanford signed Executive Order 2003-16 establishing the Governor's Water Law Review Committee (hereinafter the Committee). A copy of that Executive Order is found as an Appendix to this report.

The Committee's 19 members span a wide range of backgrounds, including professional affiliations with publicly owned electrical power facilities, state regulatory agencies, academic institutions, a variety of private industries, various public interest groups, local water and sewer authorities, representatives in both the House and the Senate of the General Assembly, a sitting Circuit Court Judge and Mayor, as well as other relevant backgrounds. An alphabetical list of Committee Members and technical staff is found on the next page.¹

With this collective background, one would anticipate that Committee members would have a wide variety of views on the water topics to be addressed in Executive Order 2003-16. In fact, this was true. Although every member of the Committee certainly did not agree on every single topic, it was extraordinary to discover that through the course of open discussion, conversation, and deliberation, Committee members found substantial agreement on a large number of matters.

On a regular basis, the Committee and three standing Subcommittees met throughout the fall of this year in Columbia and in other cities in South Carolina. During the course of its deliberations, the Committee adopted a Mission Statement (discussed in greater detail below), created a web page (through the invaluable aid and assistance of the South Carolina Department of Natural Resources) and set up three working subcommittees: The Georgia / South Carolina Subcommittee; The North Carolina / South Carolina (FERC) Subcommittee; and the Instate Subcommittee. A more complete review of the Committee's working schedule and the members on each subcommittee may be found on the Committee website at: <http://scwaterlaw.sc.gov/>

¹ The Committee is deeply indebted to all the people who worked with the Committee in a staff position. To a person, they did an outstanding job and their hard work is greatly appreciated.

Committee Members

Dana Beach	S.C. Coastal Conservation League
Robert Becker	Strom Thurmond Institute
Marty Coates	Member of General Assembly
Lynn Cooper	Private Industry
John C. Few	Circuit Court Judge
Elizabeth Hagood	Chair, S.C. DHEC Board
Ken Hill	Chair, S.C. Forestry Commission
Yancey McGill	Member of General Assembly
Gene McCall	McCall Environmental
Mike McShane	Chair, S.C. DNR Board
Dean Moss	Beaufort Jasper Water and Sewer Authority
Fred Richardson	Grand Strand Water and Sewer Authority
Thayer Rivers	Member of General Assembly
Lynn Stovall	Greenville Water System
Stephen Spitz	Chair of the Committee
John Tiencken	South Carolina Public Service Authority
Bob Waldrep	Member of General Assembly
Frank E. Willis	Mayor of City of Florence
Lynn Youmans	Farmer

Technical Assistance and Staff

Bud Badr	S.C. DNR
David Baize	S.C. DHEC
Danny Johnson	S.C. DNR
Sally Knowles	S.C. DHEC
Hank Stallworth	S.C. DNR
Mullen Taylor	Third Year Law Student, USC Law School
Alfred H. Vang	S.C. DNR

Report of Governor Sanford's Water Law Review Committee

Introductory Remarks

Early in its deliberations, the Committee unanimously agreed upon the following Mission Statement to guide its work:

To advise the Governor about initiatives needed to preserve, maintain, and manage the water resources of this state to ensure available and affordable quantities and qualities of water for present and future multiple uses.

South Carolina has long recognized that water is a highly precious resource and the Committee's work directly builds on the past efforts of many others who have previously dealt with this subject. For example, in response to earlier droughts in the 1950s, and to concerns about pollution in the 1960s and the 1970s, the General Assembly carefully studied and then formally adopted a variety of state-wide solutions to address a number of important water quantity and water quality problems. Again, in the 1980s, a former Governor's Water Law Review Committee made a variety of recommendations that ultimately led to the development of a State Water Policy, amendments to the Groundwater Use Act, the enactment of a Drought Response Act, and the passage of an Interbasin Transfer Act.

As South Carolina and other Southeastern states emerged from the most recent regional drought ending in 2002, the importance of preserving and safekeeping water quantity for current and future needs was again brought into sharp focus. After the most recent multi-year drought, it became crystal clear that this State can no longer merely assume that water will always be a plentiful, inexhaustible resource. As South Carolina's population and economy grows, our water needs will necessarily grow as well, and because South Carolina shares rivers with Georgia and North Carolina, our future water needs are clearly tied into trans-boundary, multi-state questions.

Competition for water use, both intrastate and interstate, is a fast approaching reality for South Carolina. The State should meet this challenge now. At the present moment, it is highly fortunate that no severe drought exists and therefore no water

crisis is imminent. Nonetheless, the certainty of future droughts, and the further certainty that the re-enactment of several pending Federal Power licenses will critically impact water areas of this State for many decades to come, emphatically supports the proposition that if nothing is done at present, the next water conflicts and future droughts will cause real concerns inside this State. Wise decisions - made now - can avoid these unfortunate impacts and ensure our water supplies are adequate.

Because South Carolina faces new and more complex water issues brought about by greater water consumption not merely within the State, but within the entire Southeast region, our own water management practices can no longer operate in a vacuum; how Georgia and North Carolina manage and use water has a significant effect on South Carolina's use and management, and vice versa. These issues pose a great challenge. At the same time, they offer great opportunities as roads to cooperation with our neighbors. Instead of contentious and expensive litigation, cooperation offers the promise of ensuring our own water supplies for decades to come. All these matters are addressed in this water report.

Governor Sanford, this report is very respectfully submitted to you, and to the people of this State, with the sincere hope that our collective recommendations might help position South Carolina to meet the water challenges inevitably coming in the near future.

Summary of Some of the Major Water Issues Facing South Carolina

1. Interstate Questions

Several of South Carolina's most significant river basins are shared with our neighbors, Georgia and North Carolina. The Savannah River Basin is shared for several hundred miles with Georgia, and the Catawba-Santee River Basin and the Yadkin-Pee Dee River Basin are shared with North Carolina. Increasing population and development in all these states, and the natural phenomena of droughts and floods, make water resource management a growing challenge in these river basins.

Water Issues Related to Georgia

The Savannah River is one of the most important natural resources available to South Carolina, but it may also become a source of contention between this State and Georgia as Georgia contemplates greater water demand. Metropolitan Atlanta faces the need for water. At the same time, the river basin is critical to many others, including Beaufort and Jasper Counties, the vibrant North Augusta area, Anderson and its surrounding areas, and the Greenville metropolitan area. It is also a major component of the water supply for the Georgia cities of Augusta and Savannah and further allows for the legal, cost effective disposal of treated wastewater from many of the same areas. Its many reservoirs serve as premier recreation areas in both states. A fact sheet giving information about the River and its users is included as an Appendix to this report.

The recent drought demonstrated that the water supply of the Savannah River basin, long considered inexhaustible, is quite finite. Further, even without a drought, it is clear that issues related to the Savannah River Basin are very important to South Carolina's economic growth.

The Savannah River is a critical part of the municipal and industrial wastewater disposal process in both states. It has a certain amount of "assimilative capacity" which allows pollutants to be economically discharged into it without violating the legal water quality standards. Georgia currently uses the vast majority of this assimilative capacity through its permitting of large discharges from industries and municipal treatment facilities in both Augusta and Savannah. South Carolina has

relatively small discharges in scattered areas of the Basin. As South Carolina's communities grow they will need a fair proportion of this assimilative capacity to support the economical disposal of their wastewater.

Water Issues Related to North Carolina

South Carolina also faces new water challenges to the north. In North Carolina, two hydropower operators, Alcoa Power Generating Incorporated and Progress Energy, are located on the Yadkin-Pee Dee River. The Federal Energy Regulatory Commission (FERC) has the exclusive authority to grant hydropower licenses for a term of up to fifty years. These FERC licenses granted to Alcoa and Progress Energy control - in substantial part - the stream flow of the Pee Dee River, which provides a significant part of South Carolina's freshwater needs. The northeastern area of our State, from the State line to the City of Georgetown, depends on the Pee Dee River for water supply, serving a year-round population of 275,000, and more during the summer. Both Alcoa and Progress Energy's licenses expire in the near future. Under the existing licenses, Alcoa and Progress Energy are only required to release a small amount of water downstream into South Carolina. The normal stream flow is typically significantly higher and the recent drought highlights the need for a higher minimum streamflow within the FERC licenses to fully protect South Carolina's water supply. South Carolina should assert its own very important interests throughout the FERC relicensing proceedings to assure adequate streamflows to meet water supply needs for the next fifty years.

And, while perhaps not as dramatic, the licenses for Duke Power Company's eleven reservoirs in North and South Carolina are also up for renewal. The same issues must also be addressed for this river system as well.

2. Saltwater Intrusion

In certain coastal areas of the state, groundwater aquifers have been drawn down so far below sea level to the extent that saltwater intrusion presents a clear and present concern to groundwater supplies in critical areas. During the recent drought, the level of certain reservoirs within the Savannah River Basin dropped to a point that, had rain not come in September 2002, lowering levels might well have led to the elimination of releases from lakes in the upper basin into the lower basin, thus allowing the saltwater wedge from Savannah Harbor to penetrate upstream to the Beaufort-Jasper intake.

3. Limitations under Existing State Laws

Current law does not fully deal with the emerging water management problems confronting this State. South Carolina is known as a riparian state. That means, in general, that a person who owns land bounded or crossed by a natural watercourse has a protected legal right to the access and use of the stream flow running through his/her property. A riparian owner does not own the water itself, which is shared with other owners above and below the riparian owner, but is permitted by the laws of this state to access and use the water flowing by the owner's property. This right to water use is subject to a restriction of "reasonable use," meaning that all riparian owners on a river or stream possess the right to use water so long as that use causes no appreciable harm to the rights of other riparian owners. While there is much to be said that is positive about riparian law, as it undeniably offers protection to a variety of existing water users, even the staunchest of advocates of this common law doctrine recognize that it has at least one major shortcoming - the doctrine provides little legal certainty.

As the riparian right is a right held in common with other riparian owners, the right of each riparian is coequal. New water users compete on an equal footing with older users. In practice, many reasonable uses of water are often allowed under the riparian doctrine, without regard to the actual amount of water consumed or the date any particular use started. Thus, almost by definition, reasonableness is sometimes quite difficult to measure and may often change in a particular river basin as the context surrounding the water uses in the basin changes over time. This may well be fair, but it is an undeniably uncertain doctrine with significant questions of allocation.

4. Nonriparian Rights

At least in theory, riparian rights only normally extend to the riparian land. In other words, a person owning property adjacent to a river or stream possesses a riparian right to use the water from the river or stream, but only for the benefit of the owner's property adjacent to the stream or river. The water cannot be transported off the riparian property for use elsewhere. This limitation within the state's riparian doctrine is inconsistent with actual practice, in particular with public water suppliers. This contradiction potentially leaves water utilities in an uncertain legal position. The question has not often arisen in the past because there has (almost always) been sufficient water. Change that fundamental assumption, however, and the question of lake levels in one part of a river basin and demand for drinking water in another part of that same basin suddenly raises difficult technical, legal, and even emotional questions. At that point, the further question about the transportation of the large interbasin transfers of water to nonriparians becomes a real concern.

5. Public Interest

The State's current common law riparian system does not fully take into consideration the public's interest in water use. The ultimate public interest in any system of water law is to discourage waste and foster the best possible use of the resource. Beyond the interest in providing security to beneficial private uses, public interests exist in the protection of the resource in general. Such public interests include the maintenance of minimum stream flow for protection of water quality, fishery resources, navigation, recreation, and aesthetics. The riparian system does not fully provide protection to these public interests, because riparian rights are a common property system. Under a common property scheme, it is up to all the co-owners to decide if, how, and when to use their water right. The problem with a common property scheme is that when the use reaches capacity, it is possible that a "tragedy of the commons"² results. Water users, exercising their own interests, might appropriate their own share of "reasonable use" to the point that while every individual user appears to be "reasonable," collectively the river basin is at a point of exhaustion.

Current law does not fully permit the State to actively participate in critical riparian decisions and the adversarial litigation process rivets a court's attention to a particular parcel of land in dispute and is based on specific facts peculiar to that particular case. The public interest is not always fully understood within the context of litigation solely between one user and another.

6. Public Trust Doctrine

Coexisting with the private riparian right is the public trust doctrine. Under the South Carolina Constitution and by statute, the State owns in public trust the property below the high water mark of navigable waters. As a trustee for the public, South Carolina is responsible for protecting and preserving the integrity of navigable waters for current and future commercial and recreational use by its citizens. Pursuant to this state power to protect water resources, about half of the Eastern states, including South Carolina, Georgia and North Carolina, have moved towards a permit system

² In a very famous article, "The Tragedy of the Commons," Garrett Hardin suggested that when the problem becomes a "common one" - that is a problem for everyone to deal with - no one will take full responsibility - and thus "freedom in a common brings ruin to all." See Hardin, *The Tragedy of the Commons*, 162 *Science* 1243 (1968).

that alters common law riparian rights. This new system, sometimes called “regulated riparianism,” attempts a transition from a common property system to that of a public property system. Under a regulated riparian system, a water user must obtain a permit from the state in order to withdraw water. The water rights of users are determined by the permit instead of the riparian doctrine. Even so, the criteria of reasonable use is applied by the state in deciding whether to approve a permit. However, the major difference in applying the reasonable use standard under a permitting system is that the reasonable use of water is decided prior to actual water consumption; whereas under a traditional riparian approach, the determination of reasonable use occurs after the use has begun, and litigation over such use is underway.

Currently, South Carolina has in place a permitting system for groundwater use, wherein a permit is required for withdrawals of three million gallons or more per month in capacity use areas. Although most water usage is derived from surface water, South Carolina does not currently require permits for surface water withdrawals unless the withdrawal falls under the Interbasin Transfer statute.³ In contrast, North Carolina and Georgia have had a surface water permitting system in place for twenty years.

7. Successful Negotiations with other States

This State needs to position itself to successfully negotiate with other states and, if all negotiations should utterly fail, resulting in litigation, to also position itself to be in a competitive position to litigate with others. To accomplish this task is not easy.

For example, although the question of whether or not South Carolina should have a surface water permitting system is a controversial issue, with important arguments by important interests on both sides of this issue, it seems apparent that the lack of a surface water permitting system clearly impacts other water issues—as further discussed later in this report (See In-State Recommendations #3).

³ Section 49-21-10 *et seq.*, as amended, Code of Laws of South Carolina, 1976.

Committee Recommendations

1. **Instate Water Issues: New Legislation to Protect the Public**

To protect the public interest, the State should be made aware of, and, if appropriate, intervene in actions affecting private water rights. To this end, the Committee recommends that a notice/intervenor statute be adopted, allowing the State the ability to intervene in private water disputes.

As noted earlier, riparian law is solely focused on resolving disputes among private riparian owners. If, for example, a downstream riparian owner is damaged by an upstream diversion of water, the downstream owner can seek recourse in court to recover damages or seek an injunction. Although the State, as trustee for the public, may have a significant interest in the outcome of such litigation, the State is given no notice, nor opportunity to intervene if public interests are at stake. A statute that allows South Carolina to become a party to the litigation will broaden the issues considered in resolution of water disputes to include the public interest. Although the Committee unanimously endorsed the concept of State intervention, the issue of whether the State should have a conditional or unconditional right is a matter the Committee felt should be left to your discretion to recommend, as you may see fit, to the General Assembly. If the State is given an unconditional right, the Attorney General possesses the unilateral power to intervene if doing so is, in his or her judgment, in the State's best interest. If the State is given a conditional right to intervene, the Attorney General would make an application to the court showing it has good cause to intervene, but the court decides if the State can intervene.

A proposed statute to accomplish this goal is drafted below:

In any civil action in which the right to use, consume, dispose of, or withdraw the waters of this State, including surface and groundwater, is asserted, challenged, or otherwise disputed, the Attorney General shall be served with copies of all Pleadings listed in Rule 7(a) of the South Carolina Rules of Civil Procedure. The purpose of this requirement is to allow the Attorney General the opportunity to determine if the public interest would be served by the intervention of the State. The State's right to intervene shall be

an unconditional/conditional right under Rule 24(a), SCRCF. The State may intervene at any time during the time in which the civil action is pending, but the application for intervention shall be made in a timely manner, and may not delay the trial of the case, except in the discretion of the Circuit Judge.

No judgment entered affecting the rights to the State's waters may be binding except between the named parties to any civil action unless the Attorney General is properly served pursuant to this section.

Any judgment affecting the rights to the State's waters shall be served on the Attorney General. Whenever any Order of a Circuit Judge which affects "water rights" is appealed, the briefs shall be served on the Attorney General.

It shall be the responsibility of all counsel of record to comply with this section. The Clerk of Court and the Presiding Judge shall make appropriate inquiry of the parties to ensure compliance with this section.

2. Instate Water Issues: New Legislation to Protect Rivers and Streams

A minimum amount of water should be maintained to support instream needs in rivers and streams. The State should, giving due consideration to existing uses and taking into account the public need for drinking water supply, modify the current common law riparian doctrine by setting an instream flow needed for each river and stream in the State. Such instream flow will guarantee an adequate volume of water to support aquatic life and preserve water quality.

Under the State's current riparian doctrine, riparian owners can withdraw any amount of water from streams and rivers so long as the withdrawal is reasonable. The cumulative effect of all riparian owners along a river or stream withdrawing water may be reasonable as to each other, but fails to account for what is reasonable for protection of the entire river system as a public resource. Thus, multiple private withdrawals

can lead to complete exhaustion of water, leaving an inadequate supply remaining for public recreation, preservation of water quality, and maintenance of wildlife habitat.

The Committee recommends enactment of a statute that requires a certain amount of water to be preserved in rivers and streams for public purposes. This instream flow would take precedence over private withdrawals. Reasonable use of private users would be determined from the amount of water remaining above and beyond the designated instream flow.

3. Instate and Interstate Water Issue: New Legislation: Surface Water Withdrawal Permits

Withdrawals of surface water are currently unregulated in South Carolina.⁴ Many large withdrawals of surface water are occurring or are contemplated. The impact of these withdrawals is and will be significant. The Committee recommends that the State modify the current common law riparian doctrine such that a permit is required for any withdrawal greater than or equal to 3 million gallons per month. This recommendation is highly qualified to carefully grandfather all existing present users and to protect existing capital investments and reasonable investment backed expectations.

As noted previously, South Carolina has enacted a permitting system for withdrawals of groundwater, but withdrawals of surface water are subject only to reporting of amounts withdrawn greater than three million gallons per month. Consequently, while the State can track consumption of surface water, it lacks the ability to manage that consumption to maximize its beneficial use. The Committee recommends revision of the existing Surface Water Withdrawal and Reporting Act to allow for a permitting system. As explained earlier, a permitting system would alter riparian common law, in that the water rights of users would be determined by the permit instead of the riparian doctrine. Nevertheless, the riparian criteria of reasonableness would remain as the standard from which the State reviews the permit application.

⁴ As noted above at page 7, the Interbasin Transfer Act requires a permit for all withdrawals of water greater than one million gallons per day or five percent of the seven day, ten year low flow, whichever is less, when any part of that withdrawal is transferred from one river basin into another.

This is a controversial recommendation. Many interests, including interests represented on this Committee, oppose state regulation of surface water and many interests are fearful of the consequences of such regulation. Recognizing those concerns, the Committee's recommendation is a highly qualified one - suggesting that any new legislation expressly take into account reasonable investment backed expectations, the protection of existing capital investments, and the grandfathering of all existing uses.⁵

Nonetheless, while recognizing that this recommendation is not without controversy, the Committee very respectfully points out that the need for this new permit is very great for three reasons:

First, a permitting system for surface water withdrawals would serve the interests of private water users and the State. For private users, the permit would provide a measure of certainty currently missing from the riparian doctrine. A permittee would know at the outset that its use is reasonable; therefore, the permitted use is protected as reasonable through the term of the permit.

Second, for the State, the great public interest in the water management of our rivers, streams, and lakes, requires a much better understanding of the withdrawals that exist and which will exist in the future. Without this permit in place, state decision-making processes about water consumption in the future are severely impacted.

Third, and perhaps most important of all, enacting a surface water permitting system will significantly improve, and perhaps even be indispensable to, South Carolina's prospects for interstate conflict resolution.

Georgia, for example, has had in place a surface water permitting system for many years and without a corresponding permit system in place in this State, some Georgia officials have expressed public reservations about even entering into negotiations concerning water allocation of the Savannah River. Interstate water allocation involves a binding agreement on the amount of water each state is entitled to use. If South Carolina has no means of controlling withdrawals from the Savannah, there is

⁵ The grandfathering provision in any such legislation might also take into account not merely present use but foreseeable future capacity. Of course, the specific details of such legislation are beyond the scope of this report.

no way of enforcing the negotiated water allocation. With due regard to real in-state concerns, and subject to important qualifications in the proposed legislation to deal with those concerns, it is the Committee's considered opinion that South Carolina should establish a surface water permit system - prospective in nature - in order to protect its own vital interests and to lay the groundwork for successful negotiations with other states.

4. Instate Issues:

New Legislation: to Conform Riparian Law to Current Practice

Intrabasin transfers of water and use of water on non-riparian lands is not currently allowed under our common law riparian doctrine, yet it occurs every day by public water systems providing drinking water to their customers. The committee recommends that new legislation be drafted to validate the existing use of water on non-riparian lands.

The State's existing riparian doctrine confers the riparian right to use water only upon those who own property adjacent to a natural watercourse, and the use is allowed only for the benefit of that property. In practice, however, water from rivers and streams is commonly withdrawn for use on non-riparian lands. An example is a public water system whose intake is located on riparian land, but the water withdrawn is transferred to consumers who obviously are not owners of riparian land. The Committee strongly recommends that the State protect public water suppliers by modifying our riparian law to recognize existing intrabasin uses as lawful.⁶

5. Instate Law:

New Legislation: Changes to Drought Response Act

The Drought Response Act provides a sound mechanism to allocate water usage during drought conditions. The Committee recommends minor wording changes in the Act to explicitly acknowledge that the Act modifies water rights under the common law riparian doctrine.

⁶ An argument certainly exists that the Interbasin Transfer Act, as currently drafted, recognizes this very right. To clarify, however, what might be otherwise a possibly ambiguous law, additional language might be added to eliminate any question on this point.

The South Carolina Drought Response Act, § 49-23-10 *et seq.*, provides a mechanism for restricting water use during a severe drought. If the Drought Response Committee determines that restrictions upon nonessential water use are reasonably necessary to ensure adequate water supply, it is authorized to impose such restrictions for as long as the drought conditions require. Additionally, if the Drought Response Committee determines that the severity of drought threatens public health and safety, it may recommend actions to the Governor, who may declare a drought emergency and issue emergency, mandated water restrictions.

The Act in effect alters riparian law by allowing water use restrictions in times of severe shortage regardless of a riparian owner's right to reasonable use. However, the Act does not explicitly state that riparian rights are altered in these limited circumstances. The Committee recommends that the General Assembly clarify this important point so that the State can act swiftly to protect water supply without the risk of litigation slowing response time.

6. Instate Issues: More Effective Water Management

During the recent drought, impoundments and aquifer-stored water significantly aided the ability of public water systems to provide adequate water for domestic use. The Committee recommends that the State promote and encourage water conservation, more efficient use of water and water storage during times of adequate flow to better prepare the State for drought conditions, by considering incentives for water conservation, low impact development, protection of quality through watershed management and wetlands preservation and enhancement, infiltration of treated wastewater and stormwater, aquifer storage and surface impoundments.

During the recent drought, it became apparent that there is insufficient water storage during times of shortage, and with population growth expected to increase demand, South Carolina must act proactively to address our limited capacity. Water conservation through increased efficiency in supply and delivery and long range land use planning are positive first steps. Reservoir operators should adopt drought contingency plans. Incentives should be considered for water utilities and other users. A variety of new technologies have come on line dealing with the use of effluent for irrigation, the use of natural or artificial wetlands for storage and infiltration, and the

reduction of other consumptive water uses. Promotion of land use planning that protects aquifer recharge areas and encourages permeable surfaces can enhance the State's groundwater supply. Public education concerning the importance of water conservation is also an important component.

Furthermore, South Carolina should consider the development of new reservoirs for water supply. The Committee notes that off-stream reservoirs will be easier to permit than main stem reservoirs. Off-stream reservoirs are those constructed adjacent to a river. This type of reservoir does not dam the river itself, but, instead, captures high flows from a river for storage. Off-stream reservoirs are less damaging to riverine ecology yet provide the beneficial purposes of water storage, flood control, recreation, and power generation.

Finally, the State should encourage regional water systems that take advantage of the economy of scale inherent in water supply and treatment. This is even more important when those systems employ the conjunctive use of surface and groundwater. The Committee recommends a coordinated agency program to encourage wise use and management of our existing water supply.

**7. Instate and Interstate Issues:
DHEC should effectively use its Clean Water Act authority in
FERC relicensing.**

**The Committee recommends that the State's authority under
Section 401 of the Federal Clean Water Act should be used to
further all applicable State water goals.**

The Federal Power Act requires that each applicant for a FERC hydro-power license must receive a water quality certification from the state in which the hydro-power facility is located. Because the Federal Power Act preempts some state regulatory powers, the § 401 certification is one method that a state may use to impose conditions in the FERC licensee.

The Clean Water Act specifies that states must act on a § 401 Water Quality Certification within one year of receipt of a complete application or the certification is considered waived. If an application is made over a year in advance of the completion of FERC relicensing-related biological and other flow or quality-related studies, then DHEC may not have the most up to date or complete information on which to base

its decision. Santee Cooper is working with DHEC to avoid this problem by voluntarily withdrawing their application and resubmitting it after the necessary studies are completed. That solution is one that should be used as an example with other utilities.

Interstate Issues

8. Interstate Issues: Savannah River Basin Compact

The Basic Idea: A Compact between the State of Georgia, the State of South Carolina, and the Federal Government

The State of South Carolina should consider entering into a Compact with the State of Georgia and the Federal Government concerning the Savannah River. It would be in the interest of South Carolina to take the initiative to make this happen and the time to undertake this activity is now.

The Savannah River forms the State boundary between South Carolina and Georgia for almost 200 miles. Because the Federal government is such an important presence in the Basin, South Carolina cannot address any of the issues associated with the Basin by itself. In fact, the tendency of this State to do so would only exacerbate the long term problems. A binding agreement, negotiated with the State of Georgia and the Federal Government, is a highly desirable method to deal with otherwise foreseeable serious conflicts between the States and which, if done properly, will assure that South Carolina obtains its equitable share of the Basin's resources.

Ideally, if the negotiations were successful, an agreement would take the form of a River Basin Compact. A Compact is a specific form of an interstate arrangement, provided for in the U.S. Constitution and used to create binding, enforceable agreements between states. A Compact is created when the legislatures of the respective states and the Congress of the United States all enact identical Bills that encompass the agreement and those Bills are signed into law by the respective Governors and the President.

This is not a novel idea. River Basin Compacts have been created between many states and the legal form of such compacts is well defined. The alternative to an agreement between this state and our neighboring states is disagreement and litigation over water issues. Litigation between states on water issues is extremely expensive and highly unpredictable. The United States Supreme Court under the Federal Constitution has the authority to resolve disputes between the states and does so - when it comes to water issues - by using a doctrine known as “equitable apportionment.” This doctrine is a complex set of legal rules and regulations and it is not easily summarized in a sentence or two. This much, however, is clear - the United States Supreme Court allocates water on the basis of a number of factors, including a critical review of what each state needs, what each state does with the water, and how careful each state is with the water it already has. This process is not driven by any single formula or any rigid legal rule, as best illustrated by a famous quotation from New Jersey v. New York, 282 U.S. 336 (1931), where Justice Oliver Holmes penned the following lines for the Court:

A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it. New York has the physical power to cut off all the water within its jurisdiction. But clearly the exercise of such a power to the destruction of the interest of lower States could not be tolerated. And on the other hand equally little could New Jersey be permitted to require New York to give up its power altogether in order that the right might come down to it undiminished. Both States have real and substantial interests in the River that must be reconciled as best they may. The different traditions and practices in different parts of the country may lead to varying results but the effort always is to secure an equitable apportionment without quibbling over formulas.

A Compact provides the additional benefit of including the Federal Government and its many agencies as a Party. Because the Federal Government is so pervasive a force and presence in the Savannah River Basin, no action of the States that materially affects the water resources can easily be accomplished without Federal permission. The recent drought made it clear, for example, that the interests of the States in the management of various reservoirs in the Savannah River Basin are not necessarily the same as those of the Corps of Engineers. A Compact would create a mechanism

whereby the two States, working together with the Corps, can maximize the benefit of the reservoirs to all parties.

Because a Compact can encompass any issues that are agreed to by the Parties, it is an ideal vehicle to resolve a number of different questions between this State and Georgia. Most Compacts have been negotiated between upper basin and lower basin states and the traditional practice is to specify a minimum flow and quality at a specific point near the State line.

The Savannah River situation is different and somewhat unique. Because the River forms the State line, both states are interested in and affected by everything that occurs for its entire length. Water supply, wastewater disposal, flood control, economic development, recreation: all these things have the potential to create conflict between the States at any point on the River. Therefore the Compact that South Carolina and Georgia should seek to negotiate must recognize this fact and establish procedures and mechanisms to address conflicts as they arise.

Time is of the essence in the initiation of negotiations because there are, at present, no formal disputes between the States and the Federal Government over the Basin and there appears to be a willingness, even an eagerness, by many of the water users in the Basin to undertake discussions. **Accordingly, the Committee recommends that South Carolina take the initiative to immediately begin a process with Georgia and the Federal Government that can result in a River Basin Compact designed to formalize the relationships between the Parties with regard to the River and its resources.**

Some Details: The Possible Scope of a Compact

Before negotiations begin, it is hard to predict what the Compact might address.⁷ The Committee, and in one of its Subcommittee reports, has extensively looked at a variety of factors that the Compact might review and seek agreement on between the Compact Parties. Reference is made to the Committee website for a more detailed discussion of this topic. The following topics are merely mentioned as being possible issues for discussion among the interested governments:

a. The Allocation of the Usable Water Supply in the River

The division of the available water supply is the crux of any Compact with Georgia. This is an extremely complex legal, technical and political question. It will involve marrying the interests of several Federal agencies, many private interests and the State and local governments of both South Carolina and Georgia. An initial question to be answered involves the actual availability of excess water and, since the answer depends almost totally on the assumptions one makes about reservoir operations and downstream release requirements, it cannot be separated from the actions of the Corps of Engineers and other Federal agencies. It may emerge that a fair reading of the data indicates that no excess water is available and that will make the problem more complex.⁸

b. Interbasin Transfers

Another critical issue that must be acknowledged and addressed is the matter of interbasin transfers. South Carolina has two large interbasin transfers, Greenville and Beaufort-Jasper, which together are legally permitted to move 210 million gallons per day out of the Basin. Georgia at the moment has none but faces the potential for a very large one. This issue is a particular point of contention in times of drought when users in the Basin feel impacted by those who take water out of the Basin. Mandatory approaches to water conservation and staged reduction in withdrawals in times of drought can be expected to arise in negotiations on this point.

⁷ The famous manager of the New York Yankees, Casey Stengel, was once purported to have remarked “making predictions is very difficult, especially about the future.”

⁸ Some of the basic groundwork for negotiations has already been at least partially undertaken. For example, resource agencies from both Georgia and South Carolina, working in conjunction with the Army Corps of Engineers, have developed a mathematical hydrologic model of the River basin.

c. Models to Allocate Water

Several different approaches to the allocation of the water resource have been suggested. One conventional approach is to negotiate an allocation based on some external fixed criteria such as the respective States' land area of the Basin and then enforce that allocation legally. The Committee also discussed an approach whereby the water could be valued as a commodity and an allocation process could emerge through which water users would pay a Basin Trust Fund for the rights to use the water. While this concept is in its infancy, and the Committee is not expressly recommending it at this time, it may prove quite valuable in the future. A paper from the Strom Thurmond Institute discussing this approach is included as an Appendix to this Report.

d. The Allocation of the Pollutant Assimilative Capacity

The River is a critical part of the municipal and industrial wastewater disposal process in both states. It has a certain amount of "assimilative capacity" which allows pollutants to be economically discharged into it without violating the legal water quality standards. At the moment, Georgia uses the vast majority of this assimilative capacity through its permitting of large discharges from industries and municipal treatment facilities in both Augusta and Savannah. South Carolina currently has relatively small discharges in scattered areas of the Basin.

It is important that water quality standards for all parts of the River be consistent between the two States. **This matter has significant implications for economic development on the South Carolina side of the River, since lower standards arguably allow for lower cost industrial and municipal wastewater management.** This was not a significant issue as long as South Carolina was relatively undeveloped compared to Georgia. Now, however, South Carolina's Savannah River communities are growing rapidly and maximum loads are being set for the River in both State and Federal law. South Carolina must assure that it has access to its fair share.

The South Carolina Department of Health and Environmental Control (DHEC) has advised Georgia officials that, because the River is a shared resource, South Carolina claims to be entitled to half the assimilative capacity and this claim has caused some concern between the two States. This issue, along with others, seems to be an ideal candidate for formalized high-level negotiations and might be resolved either as part of a Compact, or through another mechanism such as a Memorandum of Understanding that is separate and apart from a Compact. The choice of mechanism depends on timing and whether assimilative capacity can rationally and effectively be treated as a discrete issue capable of independent resolution. The Committee believes this process decision is best left to the Governor and DHEC.

e. Similar State Protocols to Manage the River Basin

Both point and non-point sources of pollution affect the water quality of the Savannah River, and the River supports a broad and rich complex of wildlife habitats and ecosystems. From both an environmental protection and an economic equity perspective, the controls over pollution and habitat modification should be consistent between the states. Both states would benefit if water quality remains high and the environment is protected. At the same time, the failure of one state to do its part would cause both states to suffer. The Compact might well contain various protocols that obligate each state to manage its Basin resources in a consistent manner.

f. Common Management in the Basin During a Drought

An important concern for all residents of the Basin and for the Federal Government is the management of the three Federal reservoirs: Lakes Hartwell, Russell and Thurmond. The U.S. Army Corps of Engineers (Savannah District) operates these lakes principally for hydropower generation and flood control. These lakes also serve the equally important (at least from the States' perspective) functions of water supply storage, recreation, downstream water quality and habitat protection.

During the recent drought, these reservoirs served as a critical component in the conservation of water for users in the upper Basin and for flow sustenance in the lower Basin. However, as the drought proceeded into its fourth year, it became clear that the continued operation of the reservoirs for power generation had resulted in more water than necessary to provide for and protect downstream uses being released into the ocean when it could have been kept in storage. The result, in the summer of 2002, was that recreational use of the lakes had nearly ceased, shore-side businesses were closed, Anderson was in danger of losing its water intakes, and downstream users in both states were being told that, without rain, the available supply would be exhausted by January. The Corps of Engineers has a legal and economic obligation to generate power through the various dams and had no way of knowing that the drought would last as long as it did. The Committee recommends that South Carolina and Georgia develop a common position with respect to the lakes and determine, with the Corps, how best to manage the lakes, which are now being used intensely in ways not appreciated when they were first authorized. Especially important will be the development and specification of procedures to follow in times of drought emergency. The Compact, which will likely involve the Corps as the cognizant Federal agency, is the best vehicle for accomplishing this.

g. A Bi-State Strategy Concerning Future FERC Relicensing

In addition to the Federal reservoirs, privately owned hydroelectric reservoirs are located in the Basin. These include Lakes Keowee and Jocassee in South Carolina and Lake Tugaloo in Georgia. Each of these reservoirs is subject to licensing by the Federal Energy Regulatory Commission (FERC). While none of these relicensings are imminent, it will clearly be important to South Carolina to have an agreed upon process to allow both states to develop consistent positions when the time comes. This is especially important to South Carolina because Lakes Jocassee and Keowee are very important recreational and water supply resources for the upstate. The State's experience with the current FERC relicensing process on the Catawba/Wateree and the Yadkin/Pee Dee will provide an excellent point of reference for this process. The Committee recommends that the Compact specifically outline a process whereby such a common position can be developed between the states.

h. Other Possible Points of Discussion

A number of federal agencies conduct natural resource activities in the Basin including the Corps of Engineers, the Department of Energy, the Southeast Regional Power Administration, the Fish and Wildlife Service, the Forest Service, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the Geologic Survey. It has been the practice in other Compacts that one agency represents the federal government in the negotiations and in the subsequent management program. Administration of the Compact is also something that needs careful thought as would some method of resolving disputes that might arise under such a Compact. Several recent compacts between other states contain clear and specific dispute resolution processes that the parties invoke before litigation in the Courts. Those details are important but it would be putting the cart in front of the horse to discuss them at this time.

If you feel that a Compact has merit, we would respectfully recommend that you initiate contacts with the Governor of Georgia to learn if there is mutual interest on the part of that State.⁹

⁹ Although it appears that South Carolina Code of Laws § 49-21-80 assigns the responsibility for negotiation of interstate agreements to DHEC, this responsibility is not exclusive. Under Article 4 of the South Carolina Constitution, it also appears your office may lead or take part in negotiations with Georgia.

**9. Interstate Issues:
Improved Communications between North and South Carolina
Regarding Common Water Resources.**

The South Carolina and North Carolina General Assemblies are considering legislation to create a Bi-State Commission that would address, in an advisory fashion, matters of mutual interest in the Catawba River Basin. The Committee believes that river basin commissions to monitor conditions and advise regulatory agencies in both states are highly positive. A single Bi-State Commission could serve as an umbrella organization to several individual basin “subcommittees,” thus maintaining consistency and addressing issues that are statewide in impact. “Basin Subcommittees” could address those issues pertaining to each single basin, while reporting to the full Commission, so that consistency with other basins on a state-wide basis can be maintained.

Accordingly, the Committee recommends a single North Carolina-South Carolina Commission to address common interests in all river basins shared by both states.

**10. Interstate Issues:
Through all appropriate agencies, the State of South Carolina must
carefully stay deeply involved in Federal Energy Regulatory Commission
relicensing process for hydropower facilities upstream from
South Carolina.**

The Federal Energy Regulatory Commission (FERC) licenses non-federal hydropower reservoirs for a period of 30-50 years. The FERC license establishes stream flow requirements for power production and for environmental protection. Hydropower licenses for Alcoa Power Generating Incorporated and Progress Energy, located on the Yadkin-Pee Dee River in North Carolina, and the Duke Power Company license for its facilities on the Catawba River in North and South Carolina will expire soon. The licensees are already in the process of developing applications to renew their FERC licenses. This multi-year process includes professional studies of instream flow needs below the reservoirs and will result in licenses that will affect river flows into South Carolina for many (30-50) years to come.

This is a highly critical issue - as it affects water supplies for the next 50 years. The State must ensure that its internal policies, laws and regulations dealing

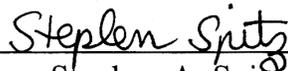
with water management and its positions taken on impoundments wholly contained in South Carolina are consistent with its requests of FERC and impoundment operators in North Carolina.

There are a multitude of issues to address in relicensing including a sufficient quantity of water of sufficient quality to sustain public supply, industry, agriculture, economic development, recreation, navigation, the protection of ecosystem habitat, and the growth anticipated with present and future users. Given the breadth of issues, a number of State agencies are necessarily involved. **The Governor's Office needs to ensure that the existing cooperation between the state agencies participating in this process continues and results in a single, unified state position that protects our quality of life. This is a critical issue to the near and long term future of South Carolina and, even in a time of economic problems, it clearly justifies a serious commitment of State resources.**

Conclusion

1. The Federal hydropower relicensing process, which is on-going even as this report is being completed, is of critical importance to this State. The future water supplies for important areas of the State are at stake.
2. Economic growth in the Savannah River Basin is at risk. If we do not find a fair, equitable method of allocating resources in the Savannah River Basin, it is unfortunately possible that disputes between this State and Georgia will exist in the future. Such disputes could be costly to litigate and uncertain in outcome.
3. Cooperation, not litigation, should be the goal of this State with the States of North Carolina, Georgia, and the Federal Government. Successful negotiations, however, require that we put our own house in order.
4. Great opportunities exist, but so do time pressures to resolve key water management questions. The importance of the issues discussed in this report calls for the State's very best efforts.
5. It was an immense pleasure for this entire Committee¹⁰ to work on this project. Thank you, Governor, for permitting all of us to serve this great State.

Very respectfully submitted,



Stephen A. Spitz

On Behalf of the Entire Committee

¹⁰ Governor - you put together a wonderful Committee. Members of the Committee dedicated countless hours of hard work, and it was an immense personal and professional pleasure to work with this group.

Appendix

- A. Executive Order
- B. Savannah River Fact Sheet
- C. Dr. Robert Becker's Comments On Use Replacement Costing

State of South Carolina
Executive Department

FILED

JUN 24 2003

Mark Hammond
SECRETARY OF STATE



Office of the Governor

EXECUTIVE ORDER NO.

2003-16

WHEREAS, the waters of the State are a finite and valuable natural resource, and an adequate supply of high quality water is essential to the health, safety, welfare and quality of life of the citizens of South Carolina; and

WHEREAS, water is vital for individual, agricultural, industrial, commercial and recreational uses, and is essential for fish and wildlife; and

WHEREAS, the laws and regulations pertaining to the State's water resources should be periodically reviewed to insure that those laws and regulations allow for the effective management and stewardship of this critical natural resource; and

WHEREAS, the Board of the South Carolina Department of Natural Resources has requested the establishment of a water law review committee to assess the State's water laws.

NOW, THEREFORE, I do hereby establish the Governor's Water Law Review Committee (the Committee").

1. The Committee shall conduct a comprehensive review of South Carolina's water laws and recommend changes that would improve those laws.
2. As part of its review of South Carolina's existing water laws, the Committee shall receive testimony from the public and interested parties.
3. The Committee shall also evaluate whether South Carolina should enter into compacts with neighboring states regarding shared water resources.

4. The Committee shall be comprised of members appointed by the Governor, including a Professor of the University of South Carolina School of Law who shall serve as its chairman.
5. The Committee shall be authorized in the furtherance of its mission to hold public hearings and take such other actions as it deems necessary and advisable.
6. The Committee shall release a report of its findings by January 13, 2004, and issue additional reports as directed by the Governor.
7. The Governor's Office and the Office of the Executive Director, Budget and Control Board, shall provide staff support as necessary to assist the Committee in carrying out the directives of this Executive Order. The Committee may also receive staff support and technical assistance from the Department of Natural Resources and the Department of Health and Environmental Control, as their respective boards and the Committee deem appropriate.

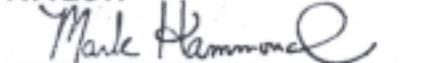
This Order shall take effect immediately.



GIVEN UNDER MY HAND AND
THE GREAT SEAL OF THE
STATE OF SOUTH CAROLINA,
THIS 24th DAY OF JUNE,
2003


MARK SANFORD
Governor

ATTEST:


MARK HAMMOND
Secretary Of State

Appendix B

Savannah River Fact Sheet

The Savannah River Basin is 250 miles long with a maximum width of 70 miles. The Basin has a total area of 10,579 square miles with 5,870 square miles occurring in Georgia, 4,530 square miles in South Carolina, and 179 square miles in North Carolina.

The Savannah River is 312 miles long from headwaters of the Chattooga River to the mouth of Savannah Harbor. Principal tributary streams in the South Carolina portion of the Basin are the Seneca River which drains from Lakes Keowee and Jocassee to Lake Hartwell, the Toxaway River which drains into Lake Jocassee, the Tugaloo River which drains from Lake Tugaloo to Lake Hartwell, the Chattooga River which flows into Lake Tugaloo, Rocky River which flows into Lake Russell, Little River which flows into Lake Thurmond, and Stevens Creek which flows into Stevens Creek Reservoir.

The average annual flow of the Savannah River is 9,286 cubic feet per second (cfs) or 6,036 million gallons per day (mgd) at Augusta, Georgia, and 11,810 cfs or 7,676 mgd at Clio, Georgia. The lowest average annual flows at these sites occurred in 2000 and were 4,754 cfs or 3,090 mgd at Augusta and 6,009 cfs or 3,906 mgd at Clio.

Lakes and reservoirs in the Savannah River Basin significantly regulate the flow of the River and its tributary streams and include the following:

Corps of Engineers Lakes

1. Lake Thurmond has a drainage area of 6,150 square miles, usable storage of 563.8 billion gallons, and electric generating capacity of 280,000 kw.
2. Lake Russell has a drainage area of 2,900 square miles, usable storage of 292.9 billion gallons, and electric generating capacity of 300,000 kw (pump back capacity—300,000 kw).
3. Lake Hartwell has a drainage area of 2,088 square miles, usable storage of 556.8 billion gallons, and electric generating capacity of 344,000 kw.

Duke Power Lakes

1. Lake Keowee has a drainage area of 439 square miles, usable storage of 300.4 billion gallons, and electric generating capacity of 157,500 kw.
2. Lake Jocassee has a drainage area of 148 square miles, usable storage of 378 billion gallons, and electric generating capacity of 612,000 kw.

3. Bad Creek has a drainage area of 1.5 square miles, usable storage of 10.8 billion gallons, and electric generating capacity of 1,065,000 kw.
4. South Carolina Electric and Gas Company has Stevens Creek Reservoir which has storage of 1.08 billion gallons and electric generating capacity of 18,800 kw.
5. Georgia Power Company has six lakes on the Tallulah and Tugaloo Rivers totaling 51.5 billion gallons of storage and 166,420 kw of electric generating capacity.

Major uses of lakes and reservoirs in the Basin include hydropower generation, flood control, water supply, recreation, fish and wildlife habitat, and navigation.

In order to protect both reservoir and river water uses during low flow periods, a drought contingency plan for the Corps of Engineers reservoirs requires that when lake elevations reach 652 ft. at Hartwell or 322 ft. at Thurmond, the release from Thurmond cannot exceed 4,500 cfs as a weekly average. When lake elevations decline to 646 ft. at Hartwell or to 316 ft. at Thurmond, releases from Thurmond cannot exceed 3,600 cfs as a daily average. If lake elevations decline to 625 ft. at Hartwell or 312 ft. at Thurmond, the release from Thurmond must be reduced to the amount of inflow. When the release is reduced to 3,600 cfs, it cannot be increased until such time that all Corps reservoirs have refilled.

The Augusta Canal Project near Augusta can divert up to 6,900 cfs from the Savannah River for the purposes of power production and water supply. Most of the diverted flow is returned to the river 4.5 miles downstream from the point of diversion.

South Carolina counties located entirely or partly within the Savannah River Basin had a 2000 population total of 682,900. This population is projected to be 852,100 by 2025 for a 25 percent increase. Similar rates of increase are expected in other portions of the Basin. Major population and development areas in the Basin are Savannah and Augusta, Georgia, and Anderson and North Augusta, South Carolina.

There are currently 72 major (>100,000 gallons per day) water withdrawal users in the South Carolina portion of the Savannah River Basin. Seventeen of these are for public water supply, 12 for industrial supply, four for power generation, 13 for agricultural irrigation, and 26 for golf course irrigation. The total average daily withdrawal for these water users, exclusive of power production, is approximately 161 million gallons per day. Three of the public supply withdrawals (Greenville Water System, Beaufort-Jasper Water and Sewer Authority, and Edgefield County Water and Sewer Authority) are interbasin transfers from the Savannah Basin and have a total authorized transferral amount of 216 million gallons per day.

DHEC has issued 44 domestic and 34 industrial individual Wastewater Discharge Permits for the South Carolina portion of the Savannah Basin. In addition, 82 discharges are authorized by Waste-

water Discharge General Permits, and 38 facilities have been issued No Discharge Permits for land application of treated wastewater. Georgia uses most of the wastewater assimilative capacity in the lower reaches of the River, especially in the Savannah Harbor area. Water quality modeling indicates that the River will need reductions in wastewater input.

Water quality data for the South Carolina portion of the Savannah Basin are available from DHEC, USEPA, and USGS. Fifty-seven locations in the Basin are not meeting at least one water quality standard, and approximately 80 percent of these violations are due to fecal coliform bacteria, probably from non-point sources. Of the five stations in the mainstem of the Savannah River, only one does not meet standards, and that is due to fecal coliform bacteria. Nine waters in the Basin have fish consumption advisories due to PCB or mercury levels. Other water quality issues in the Basin to be resolved are :1) finalize standard for dissolved oxygen in Savannah Harbor for Georgia; 2) complete water quality models for the Savannah River and Savannah Harbor; and 3) develop TMDL for Savannah Harbor for dissolved oxygen. The Savannah River Basin includes diverse aquatic and terrestrial habitats that support a variety of recreationally, economically, and ecologically important species of fish and wildlife, including Federally designated endangered species.

Appendix C

Pricing a Resource

A critical issue that is raised by the creation of watershed management is that of economic and other trade-offs between users of the river and associated resources. The resolution of conflicts between the multiple uses in different sections of a river, while ensuring equity and efficiency, is central to an integrated water allocation and watershed management approach.

The use replacement cost modeling and hedonic pricing or some other method as the basis for determining exchange of water quality values as well as water quantity allocation along the river corridor should be considered. Often the question of pricing water falls into an argument of water as a commodity or water as a trust resource. This distinction should be addressed through an examination of minimum household needs for health and safety issues. This quantity should be considered a merit good subsidy and provided without price outside the existing distribution and treatment costs. Allocation of the resource without price beyond that health and safety threshold does not carry the same merit good distinction and should carry a price that reflects the opportunity cost associated with the water. Within watershed allocation usually involves use with replacement, these allocation-pricing questions should be treated in a different manner, at a lower price, than extractions without replacement. Price should also reflect scarcity. In time of plenty water prices would be reduced to near zero, in time of drought the price should increase, thus providing natural incentives for conservation activity.

Water quantity issues have long been addressed in the context of replacement costs. Contracts for water provision through the Southeast Power Authority (SEPA) have equated water diversions and requested releases in term of kilowatt production foregone. The difficulty with examination of replacement cost or cost recovery, in terms of water quality, has been the availability of detailed calibration of water quality along the course of a river and of the associated gains and losses to that water quality resulting from point source activity and non-point source land use activities.

The difficulty with managing conflict in resource allocation models arises when decisions are left to governmental management and inter-jurisdictional negotiations. The approach of sanctions and negotiations usually begin at some crisis point of resource scarcity.

Government-dictated rationing has been used often during economic crises or extreme resource scarcity. One of the appeals of rationing is it is viewed as “fair.” Everyone supposedly shares equally in reduced consumption. The rich can’t “buy their way out” of reduced consumption and use the scarce products for “nonessential” uses while the poor have trouble obtaining enough of the commodity for “essential” uses.

A price system allows consumers the freedom to decide how and how much to reduce water consumption when water becomes scarcer. When droughts occur, water systems will increase price enough to reduce aggregate consumption to the desired level. Each consumer, however, decides how to do this, deciding what water uses are most and least important.

Higher prices for any increasingly scarce commodity ultimately motivate producers to supply more of the commodity. First, in the case of water quantity, water can be stored during periods of low cost availability, then made available when the price is sufficient to defer the storage capitalization. In addition, by pricing water quantity during drought periods, owners of electrical generating facilities would be motivated to utilize condensing technologies to recover the steam now merely released into the atmosphere. This is an emerging conflict situation within several state watersheds. Second, in the case of water quality, governing entities along a river's course would have the motivation to strictly monitor construction activities, develop minimally invasive land use pattern regulations and encourage, through tax credit and other financial vehicles, private land owner participation in watershed protection.

Again, the availability of specific economic and fiscal data can move these politically conflicting actions to a decision of consumer choice. This is the heart of the issues of equity.

Equity also implies that costs incurred in meeting water needs are borne in proportion to the benefits that are produced. In specific terms, it implies that no group of individuals or geographic region be compelled to bear the costs of programs that produce benefits for individuals or groups – that costs be borne in so far a practical by those who realize benefits.

Resources

- [1]. TI: Optimizing the Riparian Buffer: Harold Brook in the Skaneateles Lake Watershed, New York
AU: Azzaino,-Zevi; Conrad,-Jon-M; Ferraro,-Paul-J
SO: Land-Economics. November 2002; 78(4): 501-14.
- [2]. TI: The Influence of Riparian Protection Measures on Residential Property Values: The Case of the Oregon Plan for Salmon and Watersheds
AU: Mooney,-Sian; Eisgruber,-Ludwig-M
SO: Journal-of-Real-Estate-Finance-and-Economics. March-May 2001; 22(2-3): 273-86.
- [3]. TI: Landowner Decision Making about Riparian Buffers
AU: Lynch,-Lori; Brown,-Cheryl
SO: Journal-of-Agricultural-and-Applied-Economics. December 2000; 32(3): 585-96.
- [4]. TI: Benefits Transfer and Low Flow Alleviation: What Lessons for Environmental Valuation in the UK?
AU: Moran,-Dominic
SO: Journal-of-Environmental-Planning-and-Management. May 1999; 42(3): 425-36.
- [5]. TI: An Econometric Estimation of Industrial Water Demand in France
AU: Reynaud,-Arnaud
SO: Environmental-and-Resource-Economics. June 2003; 25(2): 213-32.
- [6] TI: Pollution, Property, and Prices
AU: Dales,-J-H
SO: University of Toronto Press, 1968
- [7] TI: An Examination of Non-regulatory Methods for Controlling Nonpoint Source Pollution
AU: Mitchell,-David-Michael
PB: Ph.D. Dissertation. Oklahoma State University 2001
- [8] TI: Tradable Discharge Permit System for Water Pollution: Case of the Upper Nanpan River of China
AU: Tao,-Wendong, et-al
SO: Environmental-and-Resource-Economics. January 2000; 15(1): 27-38.
- [9] TI: Transferable Discharge Permits and Economic Efficiency: The Fox River
AU: O'Neil,-William et-al
SO: Journal-of-Environmental-Economics-and-Management. December 1983; 10(4): 346-55.
- [10] TI: Markets in Licenses and Efficient Pollution Control Programs
AU: Montgomery,-David-W
SO: Journal of Economic Theory, January 1982; 5: 395-418.

- [11] TI: Incentive for Innovation as the Basis for Effluent Charge Strategy
AU: Orr,-Lloyd
SO: American Economic Review. May 1976; 66: 441-447.
- [12] TI: Pollution Standards vs. Charges Under Uncertainty
AU: Tisato,-Peter
SO: Environmental and Resource Economics. March 1995; 5: 95-115.
- [13] TI: Adaptive Cost-Effective Ambient Charges under Incomplete Information
AU: Ermoliev,-Yuri; Klaassen,-Ger; Nentjes,-Andries
SO: Journal-of-Environmental-Economics-and-Management. July 1996; 31(1): 37-48.
- [14] TI: Effluent Charges and Licenses Under Uncertainty
AU: Roberts,-Marc-J; Spence,-Michael
SO: Journal of Public Economics. April-May 1976; 5(3-4): 193-208.
- [15] TI: Joint Production and Averting Expenditure Measures of Willingness to Pay: Do Water Expenditures Really Measure Avoidance Costs?
AU: Abrahams,-Nil-Adote; Hubbell,-Bryan-J; Jordan,-Jeffrey-L
SO: American-Journal-of-Agricultural-Economics. May 2000; 82(2): 427-37.
- [16] TI: Groundwater Values from Avoidance Cost Studies: Implications for Policy and Future Research
AU: Abdalla,-Charles-W
SO: American-Journal-of-Agricultural-Economics. December 1994; 76(5): 1062-67.
- [17] TI: Valuing Public Goods: A Comparison of Survey and Hedonic Approaches
AU: David S. Brookshire; Mark A. Thayer; William D. Schulze; Ralph C. d'Arge
SO: American Economic Review, Vol. 72, No. 1. (Mar., 1982), pp. 165-177.
- [18] TI: A Survey of House Price Hedonic Studies of the Impact of Environmental Externalities
AU: Boyle,-Melissa-A; Kiel,-Katherine-A
SO: Journal-of-Real-Estate-Literature. 2001; 9(2): 117-44.
- [19] TI: An Hedonic Analysis of the Effects of Lake Water Clarity on New Hampshire Lakefront Properties
AU: Gibbs,-Julie-P, et-al
SO: Agricultural-and-Resource-Economics-Review. April 2002; 31(1): 39-46.
- [20] TI: The Hedonic Travel Cost Method
AU: Brown,-Gardner-M, Jr; Mendelsohn,-Robert
SO: Review-of-Economics-and-Statistics. August 1984; 66(3): 427-33.
- [21] TI: Combining Farrell Frontier and Hedonic Travel Cost Models for Valuing Estuarine Quality
AU: Smith,-V-Kerry; Palmquist,-Raymond-B; Jakus,-Paul
SO: Review-of-Economics-and-Statistics. November 1991; 73(4): 694-99.

- [22] TI: Estimating Recreation Preferences Using Hedonic Travel Cost and Random Utility Models
AU: Pendleton,-Linwood; Mendelsohn,-Robert
SO: Environmental-and-Resource-Economics. September 2000; 17(1): 89-108.
- [23] TI: Joint Hedonic Travel Cost Method: Combining Revealed and Stated Preference Data to Estimate Demand for Attribute Quality of Sport Fishing in Illinois
AU: Araujo,-Rogerio-C-Pereira
PB: Ph.D. Dissertation. University of Illinois 2002
- [24] TI: Option Price Estimates for Water Quality Improvements: A Contingent Valuation Study for the Monongahela River
AU: Desvousges,-William-H; Smith,-V-Kerry; Fisher,-Ann
SO: Journal-of-Environmental-Economics-and-Management. September 1987; 14(3): 248-67.
- [25] TI: The Evaluation of River Water Quality Improvements by the Contingent Valuation Method
AU: Green,-C-H; Tunstall,-S-M
SO: Applied-Economics. July 1991; 23(7): 1135-46.
- [26] TI: Valuing Riverside Wetlands: The Case of the “Donau-Auen” National Park
AU: Kosz,-Michael
SO: Ecological-Economics. February 1996; 16(2): 109-27.
- [27] TI: How Stable Are Public Responses to Changing Local Environments? A ‘Before’ and ‘After’ Case Study of River Restoration
AU: Tunstall,-Sylvia-M; Tapsell,-Susan-M; Eden,-Sally
SO: Journal-of-Environmental-Planning-and-Management. July 1999; 42(4): 527-45.
- [28] TI: Measuring the Total Economic Value of Restoring Ecosystem Services in an Impaired River Basin: Results from a Contingent Valuation Survey
AU: Loomis,-John-B, et-al
SO: Ecological-Economics. April 2000; 33(1): 103-17.
- [29] TI: Can Hypothetical Questions Reveal True Values? A Laboratory Comparison of Dichotomous Choice and Open-Ended Contingent Values with Auction Values
AU: Balistreri,-Edward, et-al
SO: Environmental-and-Resource-Economics. March 2001; 18(3): 275-92.
- [30] TI: The Benefits and Costs of Riparian Analysis Habitat Preservation: A Willingness to Accept/ Willingness to Pay Contingent Valuation Approach
AU: Amigues,-Jean-Pierre, et-al
SO: Ecological-Economics. November 2002; 43(1): 17-31.
- [31] TI: Estimating the Benefits of Low Flow Alleviation in Rivers: The Case of the Ticino River
AU: Buchli,-Loa; Filippini,-Massimo; Banfi,-Silvia
SO: Applied-Economics. March 2003; 35(5): 585-90.