

# Message to the 105<sup>th</sup> South Carolina General Assembly

*“The prosperity of our people depends  
directly on the energy and intelligence with  
which our natural resources are used.”*

--President Theodore Roosevelt

Natural Resources and the Environment—  
*Preparing the Land of our Children*

February 10, 1983

Richard W. Riley, Governor

This message I am sending to you today is a request for preparation of the state to confront potential environmental problems. South Carolina has been a national leader in environmental quality control and preservation of natural resources. Recently, the United States Environmental Protection Agency announced that the high quality of our air in South Carolina is being maintained by controls on air emissions. We should all commend commerce and industry and the Department of Health and Environmental Control of this State for their efforts in this regard. Our other natural resource agencies are receiving national and international recognition for their efforts as well. I am recommending that additional steps be taken to continue that leadership. Even though my concerns, enumerated below, are primarily for prevention, rather than treatment, of problems, they are no less in need of action now.

In my State of the State message last year I said that "water is our most essential natural resource" and charged a State Water Law Review Committee with evaluating the ability of our state laws and regulations to prevent economic and social disruption during periods of inadequate water supply. The Committee is to be commended for their work and the production of an excellent report containing seven major findings and recommendations. Among these are two that I offer you today.

The most important is the adoption by Act of the General Assembly of a state policy of public trust for surface and groundwater. In 1955, a year after the devastating drought of 1954, we used 950 million gallons of water per day. By 1980, water use had climbed to 6,500 million gallons per day - a 680% increase - and it is still increasing.

Rapidly escalating demands for supplies of water which are not increasing have caused water use conflict to be brought to the courts. These conflicts will grow in number as competition for water intensifies. At the present time, we have no state policy by which such competition is to be managed or through which such conflicts are to be resolved. Our guide is the doctrine of riparian rights, but even this is limited to surface waters. Adoption of a state policy of public trust for ground and surface waters will not supersede the riparian doctrine in state water law, but will serve to clarify that public interests exist in addition to those of riparians in significant waters of the state. Such a policy will help ensure the best management of water for the greatest public benefit. I respectfully urge you to adopt a state policy of public trust in all waters of the state.

The Committee also recommended that the state Attorney General, serving on behalf of the people of the State, be notified of litigation where water rights are the central issue so that the state may determine if its participation is appropriate to protect any public interest in the matter. If South Carolina is to properly manage its valuable water resources, it must at the very least be informed as to the status and type of litigation pending and be afforded the opportunity to present the State's position regarding public interests in the matter.

When Stephen Spitz, Chairman of the Water Law Review Committee, presented the Committee's report to me, he quoted a judicial opinion rendered in 1704: "The truth is, we live in an age, where men are apt to bring those things in question, of which our ancestors never doubted." Mr. Spitz added that we, too, live in such an age. I ask you to consider the fact that we will be experiencing events which are entirely new to us, and to pass legislation that will prepare our state to properly address them.

In response to other recommendations of the State Water Law Review Committee, I am requesting that several state agencies provide further study and report their findings to me and to the General Assembly. These requests are for: 1) the development of a drought response plan which will provide the state with the capability to mitigate severe effects of a drought; 2) further study and recommendations on maintaining minimum in-stream flows; and 3) further study and recommendations on significant diversions of water from one watershed to another. These activities are essential to the further preparation of our state for the competition for water that will arise as our economy and population continue to grow. I invite your participation as the agencies develop the drought response plan and other reports.

One of the greatest threats to our water resources is hazardous waste. The companies operating in South Carolina whose processes produce hazardous wastes are responsible corporate citizens, but there are a few whose carelessness, ignorance, or lack of concern continue to create threats to our environment and to our health and welfare. I have called upon our industrial and commercial leaders to consider those actions necessary for the development or expansion of waste exchanges. This may be far more effective than additional government regulation in enforcing responsible corporate citizenship.

Last year's General Assembly created an Interim study committee on Hazardous Waste chaired by Senator Verne Smith. This committee is reviewing our state's capability to prevent significant threats posed by hazardous wastes. I remain particularly concerned that there may be demands placed on our current State Hazardous Waste Contingency Fund far beyond its capability to respond. The Fund was established in 1980, and contains approximately \$300,000, two and one half years after its establishment. The clean up of the tiny Dreyfus Road dump in Columbia cost more than that. I have specifically requested the Committee to determine how best to continue this Fund at a level sufficient to respond as may be required. I urge each of you to support the work of this committee and its ultimate recommendations.

Other legislation will be brought to the General Assembly this year that is also important and basic to our pollution prevention efforts.

The Duet of Health and Environmental Control is proposing regulations to prevent the contamination of our groundwater supplies by controlling the injection of waste underground. Passage of regulations in this area is essential. Last year, I requested that you consider and pass legislation that would begin a more active state effort to curb the erosion of soil into our surface waters. Storm water run-off, erosion, and lack of sediment control are among the greatest threats to the water quality in our rivers and streams. I urge you to again consider legislation in this area.

As you know, I am committing myself to a greater effort to create jobs for South Carolinians. We have seen that population growth and economic expansion can place new pressures on our valuable natural resources and the quality of our environment; therefore, my commitment to job creation is a dual commitment one of preserving and conserving our resources while growth in our economy provides the jobs we will need during the coming years. A long-range plan to this end is particularly important now, when every effort is being made to attract new industry and business to our state.

It is becoming increasingly clear that we are entering an era in which our economic prosperity, the quality of our personal lives and the condition of the natural environment we bequeath to our children will be determined by choices we make now. Therefore, I am establishing a Council on Natural Resources and the Environment. I will ask this council to recommend the necessary steps to ensure that, as we enter the next century, South Carolina will continue to reflect the quality of life we all cherish and will provide the resources necessary for a stable and prosperous economy. It is time we looked beyond the year to year budget cycle and prepare a long-range plan - a blueprint - for our state's natural resources and environment. I will also ask the council to hold public hearings around the state for the purpose of obtaining as many views as possible on this important subject. I ask that you fully support and participate in the work of this council.

In 1952, the Paley Commission's report to President Truman stated "upon our own generation lies the responsibility for passing on to the next generation the prospects for continued well-being." Please join me in preparing a South Carolina that we can be proud to pass on.

## WATER POLICY

Problem Statement: South Carolina has no comprehensive state water policy. Many aspects of water use are currently regulated, but some important needs are not being addressed to the degree necessary. Each of these needs will be discussed separately, below. The goal of a state water policy should be to protect the public interest, provide reasonable security of private property rights; provide assurance that water is put to beneficial use, to assure the availability of water to the degree possible and to recognize the relationship between ground and surface water.

Background: Approximately 5.8 billion gallons of water were withdrawn daily in South Carolina in 1980. Thermoelectric plants used 76 percent of this total for the production of electricity. More than 17 percent went to industry, with public suppliers using five percent and two percent withdrawn for rural uses. Surface water sources provided 96 percent of the total demand, and ground water the remainder. Sixty-four percent of the total withdrawal was made at four facilities: The Oconee, Robinson and Wateree thermoelectric plants, and the Savannah River Plant. Approximately 370 mgd, or 6 percent of the total withdrawal, was consumed.

Withdrawal uses are depicted in Figure 1 and tabulated by county and sub-basin in Table 1 and Figure 2 respectively. (Water Resources Commission).

It is obvious from Figure 2 that most of South Carolina's rivers originate outside the state. There are already several South Carolina rivers whose flow is controlled by dams in other states. With increasing industrialization, this may become more and more common. It is possible that many South Carolina users will turn to groundwater, believing it to be a more reliable source.

Since 1955, withdrawals of water in South Carolina have increased by more than 500 percent, while the total population grew by a modest 40 percent (South Carolina Division of Research and Statistical Services, 1982). For the period 1955 to 1970, the rate of growth was nearly five times the national average and second only to Florida among the states. The rapid increase in demand during the past 25 years can be largely attributed to a 775 percent increase in withdrawals by thermoelectric plants. Withdrawals for public supply, rural and industrial use increased by 190, 85, and 240 percent, respectively. Surface-water use increased by 570 percent, and groundwater use by 75 percent.

In the future, based on projections for the southeastern states (U.S. Water Resources Council, 1978), withdrawal is expected to increase less rapidly. By the year 2000, approximately 6.3 billion gallons a day will be withdrawn, an increase of less than ten percent. This anticipated decline in growth rate will be the result of conservation and reuse rather than a decline in demand. Consumptive use, which has increased by more than 200 percent since 1960, is expected to increase 50 percent by the year 2000. (See figures 3, 4, and 5. S.C. Water Resources Commission.) At the same time, South Carolina's population is projected to increase by 72% between 1980 and the year 2000.

Effects of Population and Economic Growth: The State of South Carolina has already seen a substantial increase in growth, both in industry and population, during the last decade. This growth is beginning to affect the state's limited natural resources and environment. It has seriously impacted certain areas of the state, resulting in depletion of ground water, potential conflicts over surface water rights and limitations to growth due to the inability of some streams to assimilate additional wastewater. Continued growth will increase competition and may eventually force the state into allocation of water resources in critical areas and result in either the denial of permits or moratoriums on construction. Competition will also lead to more expensive solutions to the problem of acquiring water. Either of these outcomes could create a negative environment for industries, businesses or developers interested in locating in South Carolina. This scenario could result in an inability to compete with other states in attracting desirable types of new ventures, resulting in a stagnation of the states economy.

A. Water Management and Conflict Resolution:

Problem Statement: Property owners must be assured of the stability of current water supplies (excluding the instability brought about by drought or other natural condition.) Lack of such assurance may depress investment and may, in some cases, result in economic loss.

Current State Policy and Regulation: The first step in determining how to best protect property owners rights is to delineate those rights. Generally, South Carolina is a riparian rights state with respect to surface water. The riparian doctrine, which was adopted and is enforced by the judicial system in South Carolina can be stated as follows:

Every proprietor of lands on the banks of a river has naturally an equal right to the use of the water which flows in the stream adjacent to his lands, as it was wont to flow ...without diminution or alteration. No proprietor has a right to use the water to the prejudice of other proprietors above or below him, unless he has a prior right to divert it, or a title to some exclusive enjoyment. He has no property in the water itself, but a simple use of it while it passes along... Without the consent of the adjoining proprietors, he cannot divert or diminish the quantity of water which would otherwise descend to the proprietors below, nor throw back the water upon the proprietors above, without a grant, or an uninterrupted possession of twenty years, which is evidence of it. Omelvany v. Jaggars, 2 Hill 634 §9S.C. 1835).

But as between different proprietors on the same stream, the right of each qualifies that of the other, and the question always is not merely whether the lower proprietor suffers damage by the use of the water above him, nor whether the quantity flowing on is diminished by the use, but whether, under all the circumstances of the case,

the use of the water by one is reasonable and consistent with a correspondent enjoyment by the others. White v. Whitney Mfg. Co., 60 S.C. 254, 38 S.E. 456 (1901).

These statements of the riparian reasonable use doctrine remain the basic law governing surface water today. The doctrine, however, is qualified by various exceptions and special conditions.

The law governing property owners' rights to use ground water are much less clear. Remarkably, South Carolina does not have even a single reported decision from its Supreme Court defining the law applicable to ground water. Several theories have been developed in various states addressing groundwater use. These theories are generally identified as the absolute ownership doctrine, the reasonable use rule, and the correlative rights doctrine. Even though each theory provides a property owner using ground water some protection, none of the three theories provides a guaranteed amount of water to any property owner.

The South Carolina General Assembly has partially addressed ground water rights through the Groundwater Use Act of 1969 (§49-5-10, et seq., Code of Laws of South Carolina, 1976). The Act authorizes designation of "capacity use areas" in any region of the State where "...the aggregate uses of ground water in or affecting such area (i) have developed or threaten to develop to a degree which requires coordination and regulation, or (ii) exceed or threaten to exceed or otherwise threaten or impair, the renewal or replenishment of such water or any part of them." In a capacity use area, no person may use in excess of 100,000 gallons of ground water per day without first obtaining a permit from the South Carolina Water Resources Commission. (See Act for specifics)

Two "capacity use areas" have been designated, which are: (1) the Waccamaw Capacity Use Area, including the counties of Georgetown and Horry and the Britton's Neck area of Marion County, and (2) the Low Country Capacity Use Area, including the counties of Beaufort, Colleton, and Jasper and Edisto Island in Charleston County.

The discussion above addresses the major legal systems governing use of surface and ground water; however, these are not the only considerations in determining property owners' rights. Other matters, not ordinarily considered within the context of the riparian doctrine may well bear upon the determination of an individual property owner's right to use water from a particular water course. The following are but four of any number of such considerations:

First: the General Assembly has purported to convey rights to both public and private parties to a portion of the flow of various water courses through the passage of special legislation. For example, see §49-1-80, Code of Laws of South Carolina, 1976, granting permission to the International Paper Company to use 100 cubic feet per second each day of the flow of the Great Pee Dee River. No accurate inventory exists as

to the total number of such special acts of the General Assembly. Some speculation exists that such acts may be unconstitutional, violating the prohibition against special legislation; however, as in the case of §49-1-80, the paper company might now claim a right to the water through prescription. In any event, this consideration may place a cloud over the definite determination of property owner's rights in many instances.

Second, pursuant to federal and state law, numerous municipalities, industries, and others are granted permits to discharge waste water into various watercourses. Such permits are granted, in part, based upon the assimilative capacity of the watercourse at the point of discharge. Diminution of the flow of watercourse can reduce its assimilative capacity and, thus, affect the authority to discharge waste water. The relationship between the rights of waste water dischargers and the rights of property owners to withdraw water is uncertain.

Third, uses of waters from interstate watercourses cannot be controlled entirely by the policy of one state. Therefore, the rights of property owners along interstate watercourses will depend upon the ability of the states involved to resolve conflicts.

Fourth, a recognized public right, such as the navigational servitude, qualifies the rights of property owners along the State's navigable waters. The South Carolina Constitution, Article 14, Section 4, guarantees to every citizen of this State and of the United States that, "...all navigable waters shall forever remain public highways free to the citizens..." The impact of this provision, and its statutory counterpart (§49-1-10), on the riparian doctrine has not been addressed by South Carolina courts. At the present time, most water use conflicts must be resolved in court. Because these conflicts generally involve an immediate need (such as water for irrigation) this is not a satisfactory solution. The judicial process, including appeal, can take several years, by which time the plaintiff's need for water may be moot.

There are two other significant drawbacks to resolution of water conflicts in the courts. One of these is the lack of consistency in factual determinations. One jury may decide a case one way in the morning and a second jury may decide an identical case a different way in the afternoon. This provides no predictability and is unfair to water users.

The third major drawback is the lack of technical expertise available in the judicial process. In general, neither judges nor jurors are well versed in the technical disciplines which are most relevant to water law disputes.

Probably the single most obvious conclusion to be drawn from the discussion above is that the rights of the property owners to use water flowing or occurring on, beside or below their property, is at best uncertain. Much has been written about the shortcomings of the riparian

system, as well as the system of prior appropriation and various water use permitting systems. There is no correct answer to the question of which system is best, for all have shortcomings. One point should be stressed here, and that is the system of prior appropriation is not looked upon with favor for adoption in the eastern United States by property owners, legislatures, or academicians. See, e.g., Ausness, "Water Rights Legislation in the East: A Program for Reform," 24 William and Mary Law Review 547 (1983).

South Carolina, in fact, repeatedly rejected proposed legislation to adopt a system of prior appropriation during the 1950's. Today, even if the mood of the General Assembly has changed, other reasons suggest that South Carolina should no longer consider prior appropriation as a means of securing water rights. First, prior appropriation is a system at odds with the idea and practice of conservation. Under the prior appropriation system, no incentive exists to promote conservation, in that so long as the amount of water appropriated continues to be used for the purpose originally deemed beneficial, then the appropriator may continue the use with no limitation in time. Should the amount of water used decline, then that amount would be subject to reappropriation. The system encourages waste as an alternative to losing a part of the water, appropriated. This shortcoming is compounded due to the lack of review as to the beneficial nature of the water use; a use once deemed beneficial does not lose that designation regardless of changed circumstances. Even the riparian doctrine provides greater flexibility than that. Second, since the 1950's, many eastern states, including South Carolina, have developed permitting systems governing various aspects of water use: These permitting systems have been developed as needed, and for the most part, the permitting systems attempt to build in the flexibility and security missing in both the riparian doctrine and the system of prior appropriation.

In a situation in which all reasonable demands to make beneficial uses of water exceed the supply in a water source, no system of water law can provide for the demands of all uses. For this reason, choices must be made. The riparian doctrine does this, but choices are not made in a timely fashion or with consistency.

Recommendation:

1. The South Carolina legislature should pass legislation outlining standards and guidelines which would form the basis for a comprehensive permitting program (or system of programs). Such a system would regulate all significant uses of water and activities in public waterways. The following should be used as guidelines:
  - a. The purpose of the water use, including its economic and social value



- b. Impacts of the use on public health and safety
- c. Impact of the use on public resources, including wildlife and fisheries
- d. The extent and amount of harm caused to one having a prior right to use the water
- e. The potential for and practicality of avoiding harm
- f. The practicality of adjusting the quantity of water used
- g. The protection of existing water uses and values

2. Recognizing, that a uniform system of resolving the foregoing conflicts may take several years to develop, the State should consider establishing a program of mediation, arbitration, or administrative adjudication (or a combination of the three) in order to aid citizens in resolving water use conflicts. (For a discussion of these methods of conflict resolution, see Appendix A.) Such a program should be developed within the existing framework of state government and not involve creation of a new agency.

## B. Water Quality

Problem Statement: There are a number of existing laws and programs which are designed to (directly or indirectly) protect ground and surface water. These include the S.C. Pollution Control Act, Hazardous Waste Management Act, Safe Drinking Water Act, Coastal Zone Management Act, Capacity Use Program, National Pollutant Discharge Elimination System Permit Program, 401 water quality certification, shellfish and recreational waters program, environmental systems operator and well driller certification, and soil and water conservation programs administered at the federal, state and local level. In spite of these programs, there are several Areas of water quality protection which need to be improved. These include provision of reliable supplies of safe drinking water, groundwater protection, and non-point source pollution control.

### General Recommendation

Specific waters should be elevated to a higher water quality classification if eligible, in order to protect the inherent quality of the stream.

## I. Drinking Water Supply

Problem Statement: Safe drinking water is essential to the health and well-being of the state's citizens and is also an essential component of

economic development. Yet approximately one-third of the samples taken from the private wells which provide water for 35% of our state's population were found to be bacteriologically unsafe for human consumption. In addition, adequate supplies of drinking water may not be consistently available, particularly in the coastal area of the state.

Background: In the past, drinking water has been implicated in outbreaks of diseases such as hepatitis, typhoid, cholera, dysentery and others. More recently, new hazards to the public's health have been linked to drinking water containing carcinogenic and toxic substances. In South Carolina, approximately 2 million residents and 30 million tourists drink water from about 3,000 public water systems, which are monitored regularly. About 35% of South Carolina's population depends on private wells for their domestic water supply. These wells are not permitted and are not monitored regularly. Approximately 1/3 of the samples analyzed by DHEC from individual water systems are bacteriologically unsafe for human consumption. These figures may understate the problem, however, as samples are analyzed on an as requested basis. U.S. Protection Agency studies indicate that the incidence of waterborne disease is 16 times greater in rural areas than in urban areas, which is an implication of both water supply and wastewater disposal practices. This figure is particularly important in South Carolina, which has a large rural population.

In coastal areas, the problem is primarily one of quantity, rather than safety of drinking water. Growth on the coast, and particularly on the barrier islands, is occurring so quickly that the aquifer, which is the least expensive source of drinking water, could be depleted in certain places within a few years. In January 1984, the U.S. Interior Department released its National Water Summary 1983, which pointed out that coastal areas of South Carolina are increasingly prone to saltwater intrusion of their freshwater aquifers.

The underground water supply is especially important along the coast because of the relative scarcity of surface-water resources. Many of the "rivers" in the Lowcountry either are tidal bodies or are such that they cannot tolerate large-scale pumping without causing saltwater to migrate upstream, causing detrimental changes in the environment.

Existing water supply problems hint at the scope of future problems:

- In northern Beaufort County; which depends on treated Savannah River water, S.C. Water Resources Commission recently initiated a \$2.3-million study of the hydrology that affects Hilton Head Island, a research project the director says is essential in order to predict if, and when, the island will have to find another water supply.

The U.S. Corps of Engineers, Savannah District, recently completed a regional aquifer study, which concluded that Hilton Head Island

will eventually have to draw drinking water from wells on the mainland. It recommends that Hilton Head golf courses convert entirely to sewage effluent and says that future industrial demands in the Savannah area should be met by Savannah River water, rather than from the aquifer. (It stops short of calling for present Georgia industries to convert to river water.)

- In Georgetown, officials have considered building a 10-mile pipeline to transport millions of gallons of water to an area where they hope to attract new industry. The water is needed to supplement the relatively meager flow of the Sampit River.

- Heavy municipal withdrawals in the Grand Strand area have lowered water levels in the Black Creek aquifer to more than 100 feet below sea level; officials there also are eyeing inland water supplies and a costly pipeline.

Saltwater intrusion into the freshwater aquifers is the most serious threat to coastal water supplies, although contamination from sewage effluent and/or hazardous waste are also possible problems. Continuing drawdown of the aquifer by Georgia industry, golf courses, landscape irrigation, or thirsty tourists decreases the pressure of freshwater in the limestone layer that holds drinking water; hydrologists expect that as that pressure continues to decrease more saltwater from the ocean will move in.

Inland areas, which also use the aquifer for drinking-water and farming, are not at the same risk from intrusion-as the immediate coastal regions. Mainland wells can, therefore, be used to provide freshwater for the islands. However, financing such ventures will be a very difficult problem, politically as well as economically. Political units will have to be organized, and opposition from inland property owners will probably have to be overcome. It is likely that landowners who currently rely on wells will resent having the aquifer beneath their land drawn down to accommodate needs elsewhere in the state.

Current State Policy: In the Hilton Head/Beaufort area, the Water Resources Commission disagrees with the thrust of the recent Corps study and says, instead, that: 1) Savannah's industry should get onto the Savannah River as soon as practical; 2) more scientific data is needed in order to justify planning for importation of drinking water, to the barrier islands. It is seeking more data, but has no control of Savannah industry.

The coast is being rapidly developed with little constraint and heavily promoted by the state as a tourist destination on the one hand. On the other hand, much of it, including the Lowcountry counties, is designated as an official "capacity use" region, in which wells capable of pumping more than 100,000 gallons per day have to be permitted by the Water Resources Commission.

The Safe Drinking Water Act (P1-93-523) enacted on December 16, 1974, gave the U.S. Environmental Protection Agency the responsibility to establish standards to ensure the safety of drinking water. In South Carolina, DHEC is the agency responsible for ensuring compliance by public water systems. The authority is in Sections 44-55-20=30, et. seq of the State Safe Drinking Water Act and the State Primary Drinking Water Regulations.

The State has recently instituted a program requiring the certification of well-drillers and adherence to construction standards when drilling a well. This program should help to reduce the contamination found in private drinking water wells. However, this is the only opportunity the state has to control the quality of private wells; the state has no direct permitting authority over such wells unless they are drilled in a capacity use area, and even then, the thrust of permitting is on quantity of water.

Impact of Population and Economic Growth: Each new resident of the state brings with him or her the demand for approximately 100 gallons of water per day. Population growth will cause a direct growth in the need for potable water. Although increased conservation efforts can mitigate the demand for water somewhat, it is still the case that far more drinking water will be needed in the coming decades than has been needed in the past.

Recommendations:

1. All relevant state agencies and federal agencies such as the Geological Survey and the Environmental Protection Agency should cooperate to study the hydrology of "problem" areas such as the coast and to determine the demand .for drinking water in such areas. If demand is projected to exceed supply, a study should be made of the appropriate state role, if any, in assisting coastal communities in the expensive and legally complex problem of obtaining water supplies from inland areas.
2. South Carolina has one of the finest drinking water programs in the country, due in part to the fact that we are one of only a few states that has a monitoring program for public supplies. Under this program, bacteriological, chemical, and radiological analyses are conducted for all public water systems.. We need to continue and expand this program to include more extensive monitoring of private wells.
3. As stated under the problem definition section, the quality of drinking water from individual wells needs more attention. Most of these wells are shallow, unprotected wells that are more susceptible to contamination. The passage of the Well Drillers Certification Act should help alleviate the problem somewhat; at present, well construction guidelines are under development. These must be strictly

enforced to ensure that well drillers construct private wells that meet minimum requirements. However, more funding may be needed to carry out compliance and enforcement functions in this area.

## II. Ground Water Quality Protection:

Problem Statement: Ground water is a vast natural resource of incomparable economic importance to agriculture, industry, and everyday life. Because ground water lacks visibility, it is difficult to understand and easy to forget. Ignorance has led to its abuse and this abuse to the endangering of critical supplies. Ground water contamination problems already exist and the pressures on the resource from population growth and economic expansion are increasing.

Problem Definition: The massive national pollution clean-up efforts associated with landmark environmental legislation of the early 1970's focused mainly on those natural resources and pollution sources we could see or smell. Surface water and air quality, specific types of contaminants such as pesticides, or obvious sources of pollution such as hazardous waste dumps, were of principal concern. The environmental legislation of the 1970's largely ignored ground water and, in fact, probably increased ground water contamination by encouraging diversion of pollutants from the air and surface waters to the land.

Protecting ground water and preventing its pollution is essential in that once ground water becomes contaminated the problem is permanent.

In 1983, approximately 60 percent of South Carolina's population utilized ground water as a source of drinking water. Of the approximately 2,500 public water systems in South Carolina, 2,400 (96 percent) use ground water.

The current status of ground-water contamination in South Carolina is that the quality is predominantly excellent, except that there are numerous local contamination incidents which vary greatly in scale and severity. Since 1975, 218 such occurrences of ground water contamination have been documented. Slightly more than ninety water-supply wells are known to have been abandoned as sources of drinking water because of contamination.

### Effects of Population Expansion and Economic Growth

South Carolina has experienced tremendous growth and change in the past several decades and the trend is expected to continue into the next century. The growth of population, expansion and diversification of the industrial and commercial community, and the need for a change toward more intensive agricultural methods all will result in greater demands for and adverse impacts on ground-water quality.

Current State Policies: Comprehensive strategies to protect ground water quality have been proposed but not adopted legislatively in South Carolina. Management approaches which combine research, technical expertise, and administrative capacity are receiving more attention but are hampered by a lack of public awareness and state financial funds. Lack of technical support, funding, and coordinated approaches continues to constrain efforts to implement a comprehensive ground water protection program.

Current state policies, although somewhat piecemeal, are rapidly evolving as a result of the recent awareness of the long-term implications of ground water contamination. The Department of Health and Environmental Control acts to protect ground water quality through its various regulatory programs. Water-quality-management plans, describing policy, have been developed, primarily in the Section 208 planning process. The 208 Planning Process is a requirement of the federal Clean Water Act for statewide waste treatment management plans to control pollution from all sources, including those for which no point-source can be identified. (Harris and Ferguson, 1978; SCDHEC, 1980; Ferguson, Shirley, and Workman, 1983). In the evolution of these policies, it has become apparent that prevention is the key, based on the technical and administrative difficulties of correcting ground water contamination. Therefore, emphasis is placed on permitting.

Where contamination of ground water exists or is discovered, DHEC's policy is to require documentation of the problem and to notify groundwater users in order to protect public health. This must be done regardless of subsequent actions. Depending on the severity of the contamination and the hydrogeologic setting, corrective action may be required on a case-by-case basis.

Existing laws (and regulations), although not specifically written as ground-water protection statutes, are relied upon. These include:

1. S. C. Pollution Control Act
2. S. C. Hazardous Waste Management Act
3. State Safe Drinking Water Act

The need for additional laws and regulations is periodically reviewed and new regulations are proposed if necessary. For example, regulations to control leaking underground storage tanks and to govern the construction of wells will be submitted to the legislature for approval in January, 1985, for implementation in July, 1985.

The Water Resources Commission also plays a role in protecting ground water quality through its capacity use program in areas where ground

water has become depleted and through the preparation of various studies. One of the primary reasons leading to passage of this legislation was coastal saltwater intrusion, one of the state's most severe ground water problems.

Recommendations:

1. The Department of Health and Environmental Control, with the assistance and cooperation of other relevant state agencies, should develop a comprehensive strategy for ground water quality protection.

The recommended management strategy should be built around three basic points. First, the highest priority should be assigned to the preservation of high-quality aquifers. It is to South Carolina's advantage that a large portion of suspected recharge areas within the state are undeveloped. This provides a unique opportunity for the State to avoid many of the problems of contaminated ground water as found in other states, as well as allowing the use of innovative techniques of aquifer protection.

Second, the management objective should be the maintenance of drinking water standards. Finally, the major mechanism for achieving the objectives and standards for high-quality aquifers should be the regulation of land use to prohibit polluting activities within critical recharge zones. Local ordinances can be a very effective tool for ground water protection. They can be designed to deal with an area's specific problem, thus not unduly burdening the general population. Ordinances can range from regulating population densities and types of waste disposal operations to banning the sale or use of problem chemicals to the purchase of critical recharge areas to be protected from development.

2. Implementation of a comprehensive ground water strategy will require increased funding and an extensive educational effort. State and local officials, as well as private citizens, must be made aware of the consequences of their actions.

III. Non-point Source Pollution

Problem Statement: Non-point source pollution (NPS) is diffuse in nature and not usually traceable to an isolatable source and, therefore, the problem varies in intensity and complexity. The greatest source of statewide NPS pollution is agricultural activities, followed by silviculture and construction (both urban and industrial). The most serious actual and potential source of NPS pollutants in South Carolina is sediment, containing nutrients and fertilizers, pesticides, and bacteria, which results from land runoff (erosion). This may be caused by heavy and/or steady rains, as well as groundwater contamination from seepage. In coastal areas, stormwater runoff is more often the cause of non-point

source pollution. Barrier islands with low topography, sandy soils and ill-defined drainage courses naturally have high ground water tables, inland wetlands and adjacent salt marshes, all of which absorb, filter and store stormwater. Unless carefully designed, paving and construction will lead to the rapid removal of large volumes of water containing pollutants such as sediment, bacteria and lead. These contaminants can pollute tidelands and lead to the closing of shellfish beds.

Approximately 30 percent of the state's tidelands are considered polluted, with much of the pollution coming from non-point sources. The first marine organisms to show signs of contamination are shellfish, a diminishing resource that is still harvestable in South Carolina, unlike some more highly developed states.

The total impact of FPS pollution is estimated to approach that of pointsource pollution. Point sources such as municipal and industrial discharge have, in the past, received the greatest amount of attention and are, therefore, subject to significant regulation. As a result, point source pollution is largely under control, whereas NPS is generally uncontrolled.

Impact of Population Expansion and Economic Growth: Economic growth is generally accompanied by an increase in construction activity. Such increased activity will foster additional runoff and thus additional NPS pollution. from that segment of the economy. This is expected to be a particular problem in the fast-growing coastal area. Water uses impacted by this additional sedimentation include recreation, public water supplies, agricultural water use, commercial navigation, hydropower generation, industrial supplies, shellfishing and fisheries. Excess sediment caused by this additional activity pollutes by filling channels, streams and reservoirs.

Agricultural activities also contaminate waters with pesticides, fertilizers, and animal wastes. Runoff from agricultural areas contains nitrogen and phosphorus, the nutrients that contribute most to eutrophication in surface waters. Elevated nutrient levels lead to excess plankton populations which degrades water quality and adversely affects industrial, agricultural, municipal and recreational water uses. Increasing economic and population growth may result in a decline in farm operations, alleviating the problem somewhat. Conversely, increasing development pressures may force farmers; to irrigate more heavily, plow to the edges of fields, etc., making the problem worse.

NPS also can affect the groundwater of the state through seepage from underground storage of fuel and chemicals, and from fertilizers and pesticides filtering down over long periods of time. This is perhaps the most troublesome NPS pollution yet encountered. This area could be greatly affected by increased population and economic development, although improved materials and technology could significantly reduce pollution.



Current State Policy: Under Section 208 of the Clean Water Act, the South Carolina Department of Health and Environmental Control (DHEC) in conjunction with several other state agencies and entities has developed an NPS Pollution Water Management Plan which addresses the following activities: agriculture, construction, groundwater, hydrologic modification, mining, residual waste and silviculture. The Plan recommends the use of various NPS control measures known as Best Management Practices (BMP's) which will tend to prevent or reduce the amount of pollution generated by NPS.

The Land Resources Commission and the 46 Soil and Water Conservation Districts carry primary responsibility for erosion and sediment control. While conservation practices that reduce or prevent soil erosion (sediment, either by itself or as a carrier of other pollutants, is the pollutant of primary concern) have proven to be effective, their use is strictly voluntary. Working through local districts, the Soil Conservation Service has provided technical assistance to farmers and landowners in the application of BMPs. Five counties have adopted ordinances pursuant to current legislation which establish County Sediment Control Programs. These ordinances appear to be effective.

The Erosion and Sediment Reduction Act of 1983 is now law. This Act designates the Land Resources Conservation Commission as the agency for coordinating efforts to control sediment and erosion. Local and State advisory councils will be formed to study all sources of erosion and report their findings to the Legislature in 1986. The Act also requires that certain erosion control measures be used on State owned and quasi-state owned land.

The South Carolina Department of Highways and Public Transportation has policies designed to prevent standing stormwater, as do many local governments, particularly in the coastal zone. This poses a dilemma, for standing water may be a hazard in and of itself, and is certainly an annoyance. However, rapid, improperly designed drainage may seriously impair water quality, particularly in the coastal zone, and may exacerbate flooding elsewhere.

Through its power of certification of all development projects requiring state permits, the Coastal Council exerts considerable authority over a single site plan that comes into its office for review. Its recently published "Stormwater Management Guidelines" are designed to make that review process simpler by providing developers at the outset with information on what they can expect to be required to do. The Coastal Council deals with only one developer at a time at this point and is not planning regional stormwater treatment schemes that would address development already in place or cumulative impact of several projects in a given locale.

The higher the density of development, the higher the level of pollution generated by it. As most of the coastline is without legal density controls, the prospect of preventing further tidal-water contamination from runoff is not bright.

Recommendations:

1. Incorporate erosion and sediment control requirements into all state permitting procedures where applicable.
2. The Department of Health and Environmental Control has already identified those areas in the state with impaired water uses due to non-point pollution. DHEC, in cooperation with other relevant agencies, should determine the source of this pollution, determine priorities for treatment, and make appropriate legislative or administrative recommendations: to protect and restore the most vulnerable watersheds.
3. State agencies and scientists should devote considerable efforts to understanding the impacts of stormwater runoff and other non-point source pollutants on our tidelands, swamps and waterways.
4. The current standard for cropland erosion should be reevaluated. The current standard allows a maximum erosion rate that does not reduce the land's productivity. A new method, not linked to productivity, but rather to the effect of erosion on the land as well as the effect on the lower parts of the watershed must be developed. Furthermore, a minimum slope after which erosion control steps must be taken should be established.
5. An effort must be made to educate the public in general and the landowner in particular as to their responsibilities in the area of NPS pollution. While we generally believe that one must be allowed to do what he wishes with his own land, we must also realize that the land is not inexhaustible and that the greater good of future generations must take priority over the expediency of the moment. All relevant state agencies should work together to educate the general public as to the seriousness of the NPS pollution problem.
6. It should be the responsibility of the counties to establish and enforce erosion and stormwater control ordinances but such ordinances should be uniform in nature to avoid control in one part of a watershed and lack of control in another. County and municipal agencies should adopt ordinances covering all phases of construction run-off. If counties and municipalities show no interest, then the State should regulate by strengthening the existing state law.
7. State programs should consider ground water quality when identifying NPS water quality problems.

8. Clemson University should allocate part of any available research funds to study alternative agricultural practices to cut down on the use of chemical fertilizers, insecticides and erosion prone cultural practices. Urge the Legislature to allocate additional funds to Clemson University to carry out recommendation 7 above if necessary.

C. Water Development and Planned Growth:

It has often been said that water does not always occur in the time, place or amount required. Thus, shortages and conflicts can arise. Future growth must be based on limitations in water supply. Development, particularly the location of large water consuming activities, should be directed to areas of relative abundance, and not to areas of possible scarcity during shortages.

Conservation must include both judicious and nonwasteful usage and development of available supplies. Efforts should be made to store or otherwise capture water during times of abundance for use during circumstances of shortage as has been done in arid areas. Water storage can be in the form of either impounded run-off, from small scale ponds to moderate sized reservoirs, or underground storage in aquifers of good quality water which has been injected, or allowed to percolate through catch-basins.

South Carolina's total average daily stream flow is about 33 billion gallons per day. An abundance of groundwater also exists in the State's five primary aquatic systems, although no estimates have been made of their potential yield. This seemingly plentiful supply of surface water is however misleading, with water availability being very inconsistent relative to season and location. The average September flow throughout the State is estimated as 24 billion gallons per day, while ten percent of the time, total stream flow can be expected to be less than 12.5 billion gallons per day, based upon actual occurrences over the period of record. Under extreme drought situations, the seven day ten year low flow (7 Q10), would provide a total statewide stream flow of about 7 billion gallons per day, with some streams actually ceasing to flow. This amount of flow would also have to be protected from diversions and consumptive withdrawals to maintain water quality standards and other instream uses. Therefore, the actual useable flow for consumptive purposes would be less. The total statewide average daily flow would be  $(33 - 7 = 26)$  26 billion gallons per day. Today, South Carolina's average daily use is approximately 6 billion gallons per day, with peak usage approximately 10% greater. When nonconsumptive uses are considered, the available flow can be reused many times over:

Current Policy and Regulation: At the present time, the State has no formal means of guiding development into the most suitable areas. The State does offer a tax credit for the construction and installation or restoration of water impoundments.

Recommendations:

1. The State should encourage the beneficial uses of water and provide for the security of these uses through the protection and management of the water supplies upon which they are dependent.
2. All relevant state agencies should continue the study of ground and surface water resources to better determine their availability and limitations within hydrologic and geohydrologic units. Additional federal funds should also be sought for this purpose.
3. The State should develop a comprehensive long-term water supply plan to include projections of all uses by hydrologic unit, to be balanced against available supply, augmented through full use of storage opportunities, with a plan for project financing. Such a plan would define the ultimate carrying capacity of a river system, in harmony with other needs and public desires. It would also encourage the conjunctive use of available surface and groundwater resources to the best advantage of each. Local water management boards could provide guidance in either promoting growth where water is plentiful or controlling growth where water is less abundant.
4. The State should provide incentives (financial assistance, additional tax credits, etc.) to encourage both development and conservation of resources. Capturing of seasonal runoff should be encouraged as a conservation practice. Storage may be in surface impoundments or through subsurface aquifer replenishment.
5. State financial assistance should be provided for public investment in existing as well as new water resources infrastructure as a means of improving the welfare and standard of living for all citizens, assuring adequate water supplies to underwrite growth, meeting environmental standards and using the State's resource base to the maximum extent possible. Financing could be provided through a revolving loan fund established through state revenue issue and/or state consolidation and marketing of local bond issues.

D. Water Conservation:

Problem Statement: South Carolina has no statewide and very few locally enacted programs for water conservation. Few significant attempts are being made to address the wasteful uses of water, the increasing cost of water provision, emergency water shortages, or education of the public as to conservation benefits and methods. As a result, the benefits of, and need for conservation have not been popularized, nor has the public gained a realistic perception of the vulnerability of our water resources and the costs of shortages.

Background: It is clear that conservation must be practiced if our finite water supplies are to continue to meet-increasing demands. Many of our current practices are wasteful. To choose only one example, we have come to expect a glass of icewater each time we sit down in a restaurant, whether we drink it or not. In addition to the water which fills the glass, water and energy must be used to wash it, whether it is used or not, and water and energy must be used to make ice cubes. Energy is also required to pump water, purify it, and dispose of it once used.

The lack of effective programs to encourage or require water conservation has led to costly expansion programs by public suppliers to keep up with increasing domestic and industrial needs. Examples of such projects include the \$25 million proposal to relocate well fields inland from Hilton Head and the \$65 million project to bring water from the Savannah River Basin to Greenville, 27 miles away.

Public supply systems where populations have increased rapidly often lack any reserve capacity during peak demand periods, resulting in reduced water pressures and potential fire hazards. System expansions to stay abreast of demands compete with funds for other needed public services and can result in significant environmental impacts (e.g. by impacting upon low flows in source streams.) Effective water conservation programs, with programs for leak detection and repair, could significantly extend the usefulness of existing investments.

There are several aspects to water conservation, as it affects drinking water systems and wastewater facilities, that may not be immediately apparent. Because careless use of water significantly increases the load on sewage treatment facilities, the effects of water conservation must be carefully considered. Abnormal reductions in the water/waste ratio are likely to necessitate changes in treatment processes and design. On the other hand, very large reductions in the liquid portion of a septic tank system would only result in a better operated system with less chance of malfunction.

The effects on the water supply system must also be considered carefully. A large reduction over a short period of time may necessitate an increase in rates to recover lost income to the water purveyor. The majority of water systems are growing and, therefore, will not only recover from several moderate decreases in per capita use, but will thereby be more efficient and will notice an increased return on each unit of water produced. The message seems to be that water conservation practices should be established gradually, with a careful examination of their effect on the complete water treatment/disposal system.

Agricultural water conservation is a special case. Agriculture uses over 148 million gallons of water daily, or 2.5 percent of the state total use, for irrigating crops (93%) and for animal husbandry. Irrigation has

become a widespread means of maximizing crop yields. Irrigation is not practiced solely as a safeguard against drought; the use of high water consuming crops such as corn has made irrigation a competitive necessity.

Agricultural irrigation is considered to be a totally consumptive water use with little, if any, water returning directly to its source. For this reason, irrigation can lead to problems. Large-scale irrigation can result in very heavy withdrawals of groundwater and surface water sources within a short period of time. Irrigation is seasonal, with the greatest withdrawal demands occurring when precipitation and stream flow are at a minimum.

Simultaneous operation of many systems within a region can place heavy pressure on surface streams and groundwater. Over 70 percent of all irrigation water use comes from surface water. Thus stream flow, particularly in tributary streams, can be rapidly depleted. Regional groundwater level declines can occur where irrigation wells are clustered.

Water demands for irrigation can be reduced and water conserved. Impoundments to store runoff are a common means of water conservation, making irrigation feasible on smaller streams, while minimizing the impacts of the lost streamflow upon the stream. However, such impoundments should not be constructed without an adequate continuous release to protect fish and wildlife habitat downstream. Practices to reduce irrigational water use are also very important, but underutilized. These include careful selection of planting dates to fully utilize available rainfall; selection of low-water demanding crop varieties; narrow row spacing and application of mulch and no-till planting; and use of low-water irrigation systems such as drip/trickle systems. Research is needed relative to all of the above.

The financial benefits to consumers, suppliers and commercial users such as hotels are well documented. Appendix B contains additional information on the economic aspects of water conservation.

Current State Policy: Existing state policy, other than often expressed encouragement, is not specific. The DHEC requires that public water supply systems have an emergency plan for use in the event of supply disruption. This is helpful, but does not address the intent of water conservation. In the past several years, DHEC has been more aggressive in its encouragement of conservation, utilizing both seminars and enforcement procedures.

Voluntary conservation efforts have been encouraged by both the Wastewater and Water Supply Divisions of DHEC. Most of these efforts have been in areas already experiencing water problems, such as the Waccamaw District and Hilton Head. Municipalities, hotels and motel associations and entities such as the Public Service Authority (Santee-Cooper) have all coordinated their efforts with DHEC.

The Water Resources Commission has proposed a Drought Plan Enabling Statute which would require local planning for drought management and would allow the state to implement drought response measures when necessary. (See Part F). In addition, the agency works with local jurisdictions to encourage the implementation of water conservation measures.

The Land Resources Conservation Commission and the 46 Soil and Water Conservation Districts have worked closely with the agricultural community to encourage water conservation. In particular, the agency has promoted drip-trickle (often called "low pressure/low volume") irrigation through conferences, seminars and demonstration projects. The Clemson University Extension Service also encourages agricultural water conservation. Other than the above, the South Carolina Water Resources Commission, South Carolina Department of Health and Environmental Control and the South Carolina Coastal Council are considering water conservation as a necessary practice in coastal development proposals. When applied to future development in the rapidly growing coastal islands and resort areas, this policy would recognize the limits to growth which water availability may dictate. Reuse of treated effluents for golf-course irrigation at Hilton Head (where potable water is not used for nondrinking domestic purposes) is a step in this direction.

Finally, local governments are beginning to develop water conservation ordinances. In addition to a number in the Grand Strand area, Georgetown, Sullivans Island, Mt. Pleasant, Edisto Island and Hilton Head Island all have such ordinances. (See appendix for examples.)

Recommendations:

1. The State, through the Budget and Control Board, should take a leadership role in conservation by:
  - (a) Requiring conservation measures for all new state buildings or state funded projects.
  - (b) Requiring retrofitting of all or some of the existing state buildings in addition to the above.
2. The Legislature should enact a law requiring water conservation measures for new construction statewide. Several states have laws limiting the flow from showerheads, commodes, etc. This law would have a major impact in stretching the availability of our resources for future economic and population growth.

As an alternative, the Legislature could encourage local governments to adopt or modify a model water conservation ordinance. Such a ordinance should, at a minimum, require all new construction to meet standards for showerhead, commode and faucet water use. In areas

where landscaping use creates major problems, requirements for use of low volume sprinkler heads, timers, drip irrigation methods, and selective planting can be added. In areas with serious water problems or wastewater discharge limitations, still more innovative methods are needed. These include ultra-low devices for shower heads and commodes, credit for retrofitting existing homes, and allow developers to retrofit existing homes and apply the amount saved as a credit to develop new units. (This method is especially beneficial in those areas with very limited treatment plant capacity or those facing moratoriums.)

3. The Governor should establish water conservation as a major priority for the state, with education being the cornerstone of that effort. A task-force should be appointed consisting of business, municipality, industry, state, educational and civic leaders to develop and implement a statewide water conservation effort. It could include water conservation awards, a "mascot" such as Maryland's "Captain Hydro" for education programs, etc. The news-media should be used to full advantage.

4. The Public Service Commission should encourage utilities to provide incentives for conservation. For example, some utilities have developed new rate structures that penalize waste or reward conservation efforts: This tool can be very effective as consumers see the rewards of their efforts in water, sewer and electric bills.

Utilities in many areas of the state are now charging large impact tap fees on new developments to offset the cost of providing additional facilities and treatment. These utilities can develop guidelines giving credit to developers using ultra-low flow devices by proportionately reducing their impact fees. These incentives allow developers to recoup part or all of their cost for conservation measures.

5. The Governor and the legislature should consider financial (including grants) and tax incentives to reward use of conservation measures. Water conservation measures should be a required part of water projects funded under existing grant programs such as Community Development Block Grants.

6. DHEC, the Water Resources Commission and the Coastal Council, where applicable, should formally adopt a joint policy regarding water conservation requirements for future development. This could be a provision of capacity use, water supply and wastewater system permit approval, and Coastal Council certification of such projects where applicable.



7. Clemson University, the Land Resources Conservation Commission and other relevant agencies and institutions should be directed to accelerate their research into techniques for conserving water in agricultural use.

#### E. Interstate Cooperation

Problem Statement: South Carolina shares with neighboring states three out of four of the State's major river basin areas. The Yadkin-Pee Dee System and the Santee Cooper System are shared with the State of North Carolina, while the Savannah System is shared with both North Carolina and Georgia. Of the States five major ground water aquifer systems, all are shared with one or more states. Similarly, coastal estuarine areas are closely related to and influenced by neighboring activities. Water quality management, water use concerns, ground water management, air quality management, and other water and natural resources concerns require interstate cooperation and coordination with adjoining states and in some instances with the entire southeast region. The preceding issues are jointly addressed with adjoining states with varying degrees of formality and effectiveness. Water use and development and ground water management, as well as investigative, monitoring and data collection programs in general, will require more extensive cooperation and coordination if conflicts are to be avoided and future needs are to be met.

Background: State agencies in South Carolina with water resources interest and responsibilities have the authority to discuss and review matters of commonality with neighboring states, and often do so. Federal legislation, for coastal management, air, and water quality management, hazardous waste management and drinking water protection, also provide for interstate review and management of common resources, and in some cases for formal conflict resolution. The Commission on Interstate Cooperation, a joint legislative committee, also has interests in interstate matters. However, inconsistencies in policies, standards and regulations can and do occur, with sometimes unsatisfactory attempts at resolution being the result. A variety of reasons can attribute to such disagreements, including: lack of incentive for two or more states to reach a solution; inconsistencies-in state legal management authorities and regulations; competition for growth and development; lack of resources available to State agencies to concentrate on issues other than priority intrastate problems; poor communications on the issues themselves; and lack of complete problem data and impact information. Problems and divergent management policies with adjoining states have occurred and will no doubt continue to occur, regarding surface and ground waters and other issues. As examples, both neighboring

states have the authority to allocate surface waters (although in North Carolina this has not been exercised) where South Carolina does not. Water quality standards and classification differ with adjoining states on common waters in some situations. [Recent issues and conflicts of note have included coastal water quality conflicts with North Carolina, ground water depletion problems around Savannah, hydropower development on the Savannah River, and major interbasin transfers on inter state streams (Greenville).] Future issues of considerable importance could be ultimate allocation between states of both the assimilative capacity and available water supply of the Savannah River. Similar issues can also arise with North Carolina, particularly due to the amount of flow regulation on the Catawba River and Yadkin River in North Carolina, which dictate conditions in South Carolina. Ground water management can become a major issue of concern across the entire coastal plains of Georgia and South Carolina due to expectations by both states of dramatic increases in ground water usage for irrigation and other uses.

Effects of Population and Economic Growth: The three-state region of Georgia and the Carolina's will jointly experience, and compete for, significant immigration of population and economic activity during the next two to three decades. This influx will place considerable pressure on the total resource base of the region, and upon water resources in particular, due to the attractiveness of the region's water availability. South Carolina will be a recipient of impacts from North Carolina as a downstream state. Sharing a common river boundary, South Carolina and Georgia may more equally determine a common future water management position, with the opportunities from doing so being of tremendous importance.

Current State Policy: Current State attitudes welcomes opportunities for coordination where presented, with several recent examples of limited purpose or of a generally informal nature. The scope and impact of the issue(s) has determined the level of the discussion. Governor Riley has endorsed a broadly chartered committee to meet with counterparts in Georgia over areas of mutual concern, although no substantive discussions have actually followed as of yet.

The Savannah Metropolitan Water Resources Study, headed by the Savannah District of the Army Corps of Engineers, has proven ineffective as a means of problem solution and disappointing as an attempt at interstate water supply planning. The Yadkin Pee Dee River Basin Level B Study (completed in 1981) was a fairly successful attempt at two-state long-term planning and negotiation and has produced a significant amount of good-will and understanding which will allow talks to continue in a constructive manner.

Beyond day-to-day coordination of specific regulatory programs, a void remains unfilled due to little effort by this state or adjoining states to establish a comprehensive planning and policy effort for interstate conflicts and needs. Indeed, it is questionable if both adjoining states share this concern and/or have the interest to respond until such time as the problems become serious.

Recommendations:

1. The State supports the passage of national water policy legislation which provides for support to state planning and interstate coordination; and provides for Federal agency consistency with state plans and policies. An important part of such legislation is a provision allowing states to request federal intervention in water disputes concerning either water quantity or quality for either ground or surface water, when agreement cannot be otherwise reached. (However, it is understood that agreement among states is preferable to federal intervention.)
2. South Carolina should pursue the adoption of a legal water management framework compatible in authority to adjoining States to allow for enforcement of agreed to management policies between the states.
3. Agency level cooperation can be enhanced through interagency agreement between states concerning regulatory management and policy concerns, for surface water flow, quality, and development and for ground water management and protection.
4. To resolve the ground water problems in the Hilton Head Island Savannah region, South Carolina should propose to the State of Georgia that a binding agreement be entered into regarding ground water withdrawals and management in the Affected areas.
5. A cooperative program should be established with adjoining states for ground and surface water monitoring and data exchange, with maintenance of a technical data base sufficient for a future management decisions.

F. Issues Addressed by Governor's State Water Law Review Committee:

1. Interbasin Transfer Protection: In its December 31, 1982, "Report and Recommendations," the Governor's State Water Law Review Committee provided a thoughtful consideration of the potential problems of significant withdrawals of surface water, generally, and interbasin transfers of water, specifically. (See Report for details.)

Governor Riley asked the Water Resources Commission to form a committee with other affected agencies and interested groups to study

the issue. Recommendations will be presented to the Governor by November, 1984.

2. Instream Flow Protection: In its final report, the Governor's State Water Review Committee recommended that the state adopt a policy recognizing the need to maintain minimum stream flows. The General Assembly, through a joint resolution, requested that the Water Resources Commission take the lead in determining which streams are most in need of protection.

3. Drought Response: The Committee recommended that the Water Resources Commission serve as the coordinating agency for drought planning, and that it develop a detailed drought response plan. A draft Drought Response Plan has been presented to Governor Riley, and draft legislation to implement the Plan has been prepared. The legislation acknowledges that the states' water resources must be carefully and closely monitored, conserved, and managed during a drought or water shortage in the best interests of all citizens-, and that responding, to a drought is an appropriate activity for state government. A single state agency would promote the necessary coordination between local and state agencies and would have the authority to develop, coordinate, administer and enforce a comprehensive drought response plan. As a public policy, the legislation declares that the State's water resources should be conserved where practicable, used efficiently, and not unduly impaired in quality at all times, but especially during periods of droughts. Protection of citizen health and well-being would be the foremost objective of drought response. With guidance from a standing drought response committee, the State may designate drought management, areas, declare drought alerts, provide for public information as an integral part of all drought response measures, determine essential and non-essential uses, and recommend to the Governor that conditions may dictate an emergency proclamation whereby water allocation may become necessary. Local governments and water purveyors would be required to prepare acceptable drought and water shortage response plans consistent with the State Water Plan.

This committee endorses passage of drought response legislation.

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## ISSUE: WATER QUALITY STANDARDS

Problem Statement: In some coastal areas, water quality exceeds the designated water quality standards. Should these designations be upgraded to protect the uses currently being achieved?

Background and Current Policy: Under the South Carolina Pollution Control Act, the South Carolina Department of Health and Environmental Control (DHEC) is charged with responsibility for adopting and revising water quality standards regulation, four classifications exist for coastal waters; SAA, SA, SB and SC. SAA is the most protective classification and includes all waters "which constitute an outstanding recreational or ecological resource and/or water suitable for uses that require the absence of pollution." No point source discharges are allowed in such waters. According to DHEC, at least ten percent of South Carolina's coastal waters qualify for SAA classification, but no water bodies have been so classified. The Council believes that all coastal waters eligible for higher classification should promptly be reclassified.

Impact of Population and Economic Growth: With increased development in the coastal zone, water quality will become degraded. Action is necessary to preserve existing uses.

Recommendations: The classifications for all coastal waters in South Carolina should promptly be upgraded where those waters are eligible for higher classification.



## ISSUE: REGULATORY AND PLANNING AUTHORITY IN THE COASTAL ZONE

Problem Statement: In general, local governments do not take an active role in planning for growth in coastal areas. There are a number of gaps in state agency jurisdiction which are most appropriately filled by local governments

Problem Definition and Current State Policy: The South Carolina Coastal Zone Management Act gives the Coastal Council direct regulatory authority only over the "critical areas" of the coastal zone.. The term "critical areas" is defined as any of the following: (1) coastal waters, (2) tidelands, (3) beaches and (4) primary oceanfront sand dunes. The definition of these terms determine the extent of the Council's permit-issuing jurisdiction under the Act. The term "coastal zone" is defined as all land and waters in the eight coastal counties and all coastal waters and tidelands seaward to the State's jurisdictional limit.

It is true that the Act requires the Coastal Council to develop a management plan for the entire coastal zone and authorizes the Council to review all federal and state permit applications to ensure compliance with the plan. Other federal and state agencies will not issue their permits without certification from the Council that the activity for which the permit is sought is consistent with the coastal zone management plan. Through this so-called "networking of authority," the Council is involved in reviewing activities outside the "critical areas."

The crucial point, however, is that the Council's involvement depends on another state or federal agency having jurisdiction over the activity. These other agencies include the South Carolina Budget and Control Board, which has authority over activities below the mean high water mark in freshwater, navigable streams; the U.S. Army Corps of Engineers, which has authority over dredge and fill activities in wetlands and "waters of the United States" and other activities in navigable waters; the S.C. Department of Health and Environmental Control, which issues permits for water and sewer facilities and point-source discharges of pollutants; and the S.C. Water Resources Commission, which issues permits for wells drilled in designated capacity use areas: Thus, a project which does not involve a "critical area" and does not fall under the jurisdiction of one of these agencies may escape any review by the Coastal Council.

Local governments have the authority to establish and enforce zoning regulations as well as land use plans within their jurisdictions. However, they have been reluctant to do so. Only one coastal county (Charleston) has established county-wide zoning, while one other (Beaufort) has established development standards. Only four coastal counties (Charleston, Beaufort, Georgetown and Dorchester) have land use plans. As a rule, county and municipal planning and zoning commissions deal with development pressures on a case-by-case basis, and cumulative impacts frequently seem to be overlooked.

In addition, some planning in coastal areas of special concern takes place under the aegis of the Coastal Council Special Area Management Plan program. At the request of local governments, the Coastal Council will prepare a Special Area Management Plan (SAMP) for a particular resource area such as barrier island or estuary. The Plan will generally include a survey of resources, an assessment of impacts, an analysis of public interests and the option of establishing supplemental policies and development guidelines-which relate to the specific problems or assets of the area. If the SAMP is adopted by both the Coastal Council and the relevant local government, these policies will be enforced when permitting decisions are made. To date, however, only SAMPs have been adopted by local governments in the coastal zone.

We believe that this jurisdictional gap should be corrected. Major development is taking place in South Carolina's coastal zone completely free from any state regulatory review, and essentially free from local review. One clear example is the explosive growth of residential and second home development in the coastal zone. Although such development significantly affects coastal waters, only certain aspects (e.g. sewage disposal) are subject to the jurisdiction of any state agency since it is located on uplands.

Impact of Population and Economic Growth: As coastal populations expand, the impacts of poor or no planning will become more and more severe. Land use decisions will be made which are irrevocable and which may have permanent consequences for human and natural resources.

Recommendations:

1. In North Carolina, all activities in "areas of environmental concern" (similar in concept to, but broader in scope than, "critical areas" under our Act) are regulated by the State Coastal Resources Commission, while local governments, under land use plans approved by the Commission, have jurisdiction over all other developments in the coastal zone. We urge adoption of the North Carolina approach for our State. We believe that regulatory authority should be extended throughout the coastal zone to ensure that the phenomenal demographic and industrial growth now occurring along our coast will not lead to the irretrievable loss of vital resources and to the situation plaguing many coastal states. The South Carolina Coastal Zone Management Act should be amended to provide for regulation of activities in or affecting "non-critical areas" of the coastal zone by the counties, pursuant to ordinances which are consistent with the State's Coastal Zone Management Plan and approved by the Coastal Council. Public hearings should be held before such an ordinance is adopted. If a county fails to enact an ordinance within two years of the effective date of the amendments to the Act, the Coastal Council itself shall regulate activities in the "non-critical areas." Such an amendment would augment, rather than supercede, existing regulatory programs.

2. At a minimum, local land use plans must address the following:

- a. Emergency evacuation, based on the information contained in the SLOSH Model developed for the Coastal Council
- b. Water supply
- c. Sewage treatment and disposal
- d. Erosion
- e. Non-point source pollution and stormwater runoff control
- f. Recreation and public access

3. The term "critical area" should be expanded to include all waters and wetlands (regardless of salinity) in the eight coastal counties. The effect of this redefinition would be: 1) to transfer the permitting authority of the Budget and Control Board in the coastal zone to the Coastal Council and 2) to give the State direct regulatory authority over such areas. Other programs conducted by state agencies in the coastal zone would not be affected.

## ISSUE: AQUACULTURE\*/WATERFOWL IMPOUNDMENTS

Problem Statement: The development of mariculture in this state will be impaired by the lack of resolution of several other related issues, most notably the effects of impounding wetlands.

Background: In the early years of South Carolina's settlement, prior even to the Revolution, extensive areas within the influence of the ocean-tides, but where the waters were fresh, were cleared of cypress forests and diked to control water levels for the production of rice. These early impoundments had to be located in freshwater because rice will not grow in salinities greater than 4ppm. The output of these rice fields was one of the greatest success stories in American agriculture. The rice culture began to die out in the latter part of the nineteenth century, first because of the loss of the necessary labor and capital, and secondly, due to a succession of severe hurricanes which inundated the fields for miles up the riverine system with salt water. With disuse, the fields and banks gradually fell into disrepair - banks were overtopped and water control was lost.

Beginning in the 1920's, many of the old rice plantations were purchased by wealthy Northerners who had the means to restore the fields and manage them for waterfowl hunting. In the 1950's, due in large measure to the brilliant work of Dr. Robert Lunz and his associates at Bear's Bluff laboratory, it was realized that impounded waters could serve a valuable role as a producer of marine and aquatic species for human consumption.

Today there are some 504,000 acres of coastal marsh in the eight county coastal zone which includes low and high salt marsh, brackish and freshwater marshes and the beach zone. Of this total, approximately 70,000 acres are impounded.

There is a marked division of opinion within the scientific community as to the viability and utility of impounded wetlands as well as their impact on adjacent estuarine systems. In many instances, the response received will depend upon whether the question is posed to a marine biologist or a wildlife biologist.

The question of whether or not to impound also rests, to a large degree, on the response to a precedent question, what is being sought from the system? If the desired end is a controlled system managed for the production of

\*"Aquaculture" will be used to refer to the culture of aquatic organisms, since it is a more inclusive term than "mariculture" which refers only to aquaculture practiced in salt water.

specific floral and faunal species for high yield, then impoundments have unquestionably demonstrated their utility over hundreds of years. On the other hand, if indiscriminate utilization by the broadest possible spectrum of species is sought, it would seem that a free exchange of tidal waters over an open marsh system is preferable. However, it has not been demonstrated that carefully managed impoundments cannot be manipulated so as to achieve the desired result while, at the same time, continuing to operate as a source of nutrition and production for surrounding estuarine waters.

Current State Policy: The state claims prima facie title to all tidelands, unless an affirmative grant from the Crown or the State can be demonstrated and the obvious evidence exists of previous ownership and control (i.e., remnant dikes and canals) by private individuals. Destruction of records by war and fire make tracing a title extremely difficult for those who contest the state's claim. At the present time, no mechanism exists for fairly resolving questions of ownership of old rice fields, nor is there a clear understanding of the extent to which privately owned wetlands are held subject to the public trust doctrine.

In the critical areas of the Coastal zone, the South Carolina Coastal Council has direct regulatory authority over proposed impoundments. The Coastal Council will deny requests to impound previously unimpounded salt marshes, unless overriding public need can be demonstrated. Impoundments will only be considered in those areas that show evidence of having been previously impounded. The Coastal Council has never issued a permit to impound previously undisturbed and undiked tidelands. Beyond certain bare requirements, the Coastal Council does not determine ownership questions.

Impact of Population and Economic Growth: As the coastal population and economy expand, pressures on all coastal resources will increase. Impoundments, in particular, will receive considerable attention as they are a source of both recreational (hunting), and economic (aquaculture) activity.

Recommendations:

1. The Coastal Council should prohibit the impoundment of undisturbed salt marshes.
2. Continued research into the impacts of impounding brackish and fresh water wetlands should be funded in order to determine:
  - a. Impacts on adjacent waters
  - b. Management systems that can lessen or abate any negative impacts
  - c. Compatibility of managing for waterfowl and aqua-mariculture
3. If such impoundments are found to have deleterious effects, they should be prohibited; if not, they should be granted. Permits should be issued only with sufficient conditions to eliminate the potential for environmental damage.

## ISSUE: AVAILABILITY OF BASELINE INFORMATION FOR COASTAL ZONE MANAGEMENT

Problem Statement: Certain information which would seem to be necessary for prudent management of coastal resources is not available.

Current Policy and Background: During our investigation of coastal zone issues, we asked the Coastal Council how many acres of tidelands had been filled pursuant to Coastal Council permits. The Council responded that this question was "impossible to answer without undertaking an extensive research effort." We believe that such information should be readily available for management agencies and the public.

### Recommendations:

1. The Coastal Council should research all permits issued since the inception of the program, and should maintain a continual record thereafter of:

- a. Number of acres filled for public use
- b. Number of acres filled for private use
- c. Mitigation required as a result of permit issuance
- d. Actual acreage filled (this may differ from permitted acreage)
- e. Acreage illegally filled
- f. Acreage illegally filled and required by the Coastal Council to be restored

2. An inventory should be made to determine:

- a. Acreage and location of currently impounded wetlands
- b. Percentage of these which are fresh, brackish and saline
- c. Percentage currently owned or managed by the state or federal government
- d. Acreage previously impounded, but currently unmanaged and uncontrolled within the critical area and the coastal zone as a whole