DESIGNING A CITIZEN'S GUIDE TO STATEWIDE WATER PLANNING IN GEORGIA

by

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(Under the Direction of Laurie A. Fowler)

ABSTRACT

The purpose of this thesis is to develop an educational citizen's guide that will promote effective citizen participation in the statewide water management planning process in Georgia. This thesis provides a discussion and analysis of theories of public participation and explains the benefits of public participation in the context of Georgia's statewide water management planning process. Without public education, it is more difficult for citizens to participate effectively. For the benefits of public participation to be fully realized in the development and implementation of the statewide water plan, the participants must be educated about the process and the issues to be resolved. This thesis uses the Interactive Model of Program Planning to create an online citizen's guide to statewide water planning in Georgia that is designed to help citizens participate effectively in the planning process.

INDEX WORDS: public participation, public involvement, citizen participation, environmental decision making, statewide water management planning, Georgia water management planning, adult education, program planning

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TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS iv

LIST OF TABLES vii

LIST OF FIGURES viii

CHAPTER

1 INTRODUCTION 1

Georgia's Comprehensive Statewide Water Management Plan 2

The Value of Public Participation 3

Methodology 4

Overview of Thesis 6

2 WATER MANAGEMENT IN GEORGIA 8

Overview of Georgia Water Law 9

Georgia's Need for a Comprehensive Statewide Water Management Plan 13

Problems Resulting from Uncoordinated Water Management 18

Legislative Efforts Towards Georgia's Comprehensive Statewide Water Management Plan 21

The Georgia Water Coalition and its Involvement 24

Developing Georgia's Comprehensive Statewide Water Management Plan 25

3 PUBLIC PARTICIPATION IN ENVIRONMENTAL DECISION MAKING 30

Defining Public Participation 30

A History of Public Participation in Environmental Decision Making 33

Benefits of Public Participation....36
Characteristics of an Effective Public Participation Program....42
Public Participation Techniques....44
Factors Influencing Participation....49
Education – A Necessary Component of Public Participation....51
The Benefits of Public Participation in the Context of Statewide Water Planning in Georgia....53
Public Participation and EPD's Statewide Water Planning Process....54
4 DESIGNING AN EDUCATIONAL PROGRAM BASED ON PROGRAM PLANNING THEORY OF ADULT EDUCATION....57
Program Planning Models for Adult Education....58
Social and Organizational Context of Program Planning....61
Negotiating Needs for the Program....68
Negotiating Program and Learning Objectives....76
Negotiating the Development of the Instructional Program....79
Negotiating the Program's Financing and Marketing....83
Negotiating the Evaluation of the Program....84
5 THE CITIZEN'S GUIDE TO STATEWIDE WATER PLANNING IN GEORGIA....87
Review of Citizen's Guides....87
User-friendliness....96
Examples of Effective Guides....98
The Online Guide to Statewide Water Planning in Georgia....100

5 CONCLUSION 104

LITERATURE CITED 107

APPENDICES 112

A Survey 113

B List of Guides Consulted 115

C The Online Citizen's Guide to Statewide Water Planning in Georgia 117

LIST OF TABLES

Page

Table 4:1 Responses Regarding Importance of Specific Content in Online Citizen's Guide 74

Table 4:2 Sorting and Prioritizing Suggestions from Respondents 75

Table 4:3 Program Objectives 77

Table 4:4 Learning Objectives 79

Table 4:5 Instructional Plan 81

Table 5:1 Comparison of Content in Participation Guides 89

LIST OF FIGURES

Page

Figure 2:1 River Basins, Groundwater Regions, and Metropolitan Statistical Areas in Georgia 14

Figure 2:2 Georgia EPD's Public Involvement Process 27

Figure 3:1 Ladder of Citizen Power in Participatory Processes 32

Figure 3:2 Comparison of Length of Time: Unilateral Decision versus Public Participation.....41

Figure 4:1 Caffarella's Interactive Model of Program Planning 60

Figure 4:2 Thesis Stakeholder Map 64

CHAPTER 1

INTRODUCTION

Georgia is blessed with clean, flowing water. The abundant supply has enabled the state's population growth and economic activity over the past few decades. From 1990-2000, the population in Georgia increased 26.4%, compared to the national increase of 13.1% (U.S. Census Bureau 2006). This accelerated rate of growth, combined with severe and persistent drought, puts a strain on Georgia's water resources. Off-stream water uses, such as municipal supply, industrial supply, and irrigation, compete with in-stream water uses, such as hydroelectric power production, navigation, waste assimilation, recreation, and wildlife habitat.

Georgia faces numerous water quantity and quality challenges. Sixty percent of surveyed river miles and 84% of surveyed lakes are impaired, with urban runoff and other nonpoint sources as a major cause of impairment (U.S. EPA 2002). A federal court order was issued to develop total maximum daily load, or TMDL, plans to attain water quality standards. The Floridan Aquifer is under stress from saltwater intrusion. With little consideration for cumulative impacts and conservation alternatives, reservoir construction continues in regions of Georgia characterized by small streams, no natural lakes, limited groundwater supply, and high population growth. Concerns over water supply sparked the tri-state water dispute in 1990 with Alabama and Florida, which remains unresolved today.

For more than 30 years, state and federal officials attempted to address water quality and quantity problems through isolated water management approaches. These piecemeal solutions, however, do not attend to the complexity of the situation. Water resource challenges are interwoven, and solutions generally involve many stakeholders and often stir up emotional

debate and scrutiny. For the first time, Georgians have the opportunity to comprehensively review where we have been, where we are now, and where we should be going.

Georgia's Comprehensive Statewide Water Management Plan

In 2004 the Georgia General Assembly passed legislation that enables the development of Georgia's first comprehensive statewide water management plan. The Comprehensive Statewide Water Management Planning Act provides the overall vision: "Georgia manages water resources in a sustainable manner to support the state's economy, to protect public health and natural systems, and to enhance the quality of life for all citizens" (O.C.G.A. § 12-5-522 (a)). The Act identifies nine principles that should guide plan development. The initial plan is to be completed no later than the first day of the 2008 General Assembly session (O.C.G.A. § 12-5-524 (b)(4)).

For the first time since the development of Georgia's water laws and management program in the late 1960s and early 1970s, Georgians have the opportunity to examine the state's water management goals and identify a set of statutory, regulatory, and policy recommendations that will meet the needs of future generations. The planning process will evaluate water trends and conditions as well as the statutes, rules, programs, and policies that make up the existing water management structure. By comprehensively examining the current management approach, persons involved will identify gaps and weaknesses, options for addressing them, and the pros and cons of each option (Kundell 2005).

One of the Act's nine guiding principles is to "involve meaningful participation, coordination, and cooperation among interested and affected stakeholders and citizens as well as all levels of governmental and other entities managing or utilizing water" (O.C.G.A. § 12-5-522 (b)(8)). The Act requires the Georgia Environmental Protection Division (EPD) to "solicit extensive stakeholder involvement in the development of the proposed plan" (O.C.G.A. § 12-5-

523 (b)). The stakeholders specifically mentioned are state agencies, nonprofit advocacy organizations, businesses, local government entities and associations, and regional development centers (O.C.G.A. § 12-5-523 (b)).

Public input is necessary throughout the planning process to ensure that the product reflects the goals and values of Georgians (Kundell 2005). Because the process will involve many parties and address numerous water issues that may have a significant impact on a variety of stakeholders, there is a need for educational materials that will increase awareness and educate citizens about the planning process and the components of the plan. Educating stakeholders about the issues that will be addressed in the plan may also empower them to become more involved, which will ultimately lead to public ownership of the plan.

The Value of Public Participation

According to a report published by the Pacific Institute about sustainable water success stories in California, one of the lessons learned is that "almost all successful water projects brought competing and conflicting stakeholders together in cooperative arrangements. Cooperation, rather than confrontation, led to an understanding of different points of view and a willingness to explore compromises and creative solutions that benefited all parties" (Wong et al., 1999).

Public participation is now widely accepted as an indispensable component in environmental decision making. It is a valuable tool for developing ownership, partnerships, understanding, and commitment, all of which are indispensable to implementing policy decisions (Tuler and Webler 1999). Public participation provides numerous benefits, including improving the quality of decisions, building consensus, maintaining legitimacy and credibility, and increasing the ease of implementation (Creighton 2005). Traditional public hearing and

comment procedures are being replaced by innovative approaches that incorporate public values in decisions, address conflict, and build trust (Beierle and Konisky 2000).

Although public participation is recognized as a key component of proper water management, a successful public participation program is difficult to implement in practice. Public input can be valuable, but citizens often lack financial resources and technical data required to participate fully in the planning process and the implementation of the plan. Without effective participation from citizens and stakeholders, the benefits of public participation cannot be realized during the planning process. Educational materials can help bridge this gap. If citizens have access to helpful and reliable educational materials, then they can quickly and easily understand the process, and this knowledge will make their input more effective. Therefore, the need for educational materials to facilitate effective public participation is essential if the benefits of the public participation process are to be realized.

Methodology

This thesis addresses the relationship between public education and citizen participation in the context of the statewide water planning process in Georgia. It discusses the value of public participation in environmental decision making, and explains why public education is necessary to achieving the benefits associated with public participation. The goal of this thesis is to educate citizens about the statewide water planning process in Georgia so that their participation will be more effective.

There are three main objectives. First, I determined whether and if so, why, public participation is necessary in the context of Georgia's statewide water management plan. Second, I determined whether education is a key component of an effective public participation program.

Third, I determined the need for and developed an educational citizen's guide to promote effective citizen participation in the statewide water planning process.

To accomplish the first two objectives, I analyzed the history of water management in Georgia and past attempts at water planning. I examined the goals and planning framework of Georgia's current statewide water management planning process. I researched the current best thinking available on the topics of public participation, environmental decision making, and program planning for adult education. I accomplished this through a literature review of books, journals, and other citizen's guides. I talked to colleagues who have experience in environmental resource planning, decision-making processes, and water issues in Georgia. Finally, I drew from my personal experiences of working with the Georgia Water Coalition, where I assist stakeholders with developing water policy recommendations for statewide water planning in Georgia.

For the third objective, I determined the need for an educational citizen's guide by analyzing the statewide water planning process and the public participation element, gaining knowledge about past stakeholder experiences, and surveying stakeholders. I determined what elements to include in the citizen's guide by reviewing other participation guides, talking to those responsible for producing the guides, talking to colleagues familiar with the water planning process, surveying stakeholders, and drawing from my personal knowledge and previous experiences. I used Caffarella's (2002) Interactive Model of Program Planning and Cervero and Wilson's (1994) program planning theory to develop the citizen's guide.

The final product is an online guide that will educate citizens about the statewide water planning process and empower them to become involved. The guide, which will be updated regularly, includes an overview of the water planning process, a description of water issues to be

addressed, an action plan for involvement, and a glossary of terms. My hope is for this guide to help citizens participate effectively, which will ultimately lead to the development and implementation of a statewide water plan that reflects the interests of a broad group of Georgians.

Overview of Thesis

Chapter Two provides an overview of Georgia's current water management approach, including a brief history of water planning in Georgia and regional water management efforts that are currently taking place. It discusses the need for a comprehensive statewide water management plan and the legislative actions taken towards developing the plan. It summarizes Georgia EPD's plan development and public participation processes. The complexity of water management in Georgia and the significance of the Comprehensive Statewide Water Management Plan underscore the need for educational materials to help those who are involved both directly and indirectly in the planning process to participate more effectively.

Chapter Three provides an overview of public participation in environmental decision making, including when and why it was adopted in U.S. policymaking, the benefits, why people choose to get involved or not get involved, and the characteristics of an effective public participation program. It shows why public participation is needed to resolve issues that involve values-based decisions, which include most decisions related to environmental issues. It includes a summary of public participation techniques, including how to get information to and from the public, and factors that influence participation. Chapter Three concludes by emphasizing the need for public education throughout the participation process.

Chapter Four discusses the program planning process used to develop the online citizen's guide to statewide water management planning in Georgia. The particular program planning

theory and model employed, which is designed by Cervero and Wilson (1994) and Caffarella (2002), takes into consideration power, interests, and negotiation, which are central to planning a program related to a political process. The program planning process includes the following steps: discerning the context, building a solid base of support, negotiating program needs, identifying program and learning objectives, developing an instructional plan and transfer of learning plans, determining financial and marketing needs, and evaluating the program.

Chapter Five discusses my review of various citizen's guides in the development of my online citizen's guide. I analyzed a variety of guides related to environmental planning and management and interviewed several people from organizations responsible for the guides. This chapter is a discussion about the common elements among citizen's guides, characteristics that make the guides user-friendly, an overview of my citizen's guide, and how my guide differs from EPD's website. The Online Citizen's Guide to Statewide Water Planning in Georgia is at www.citizenswaterplanning.org.

Chapter Six concludes the thesis by providing a summary of my research and the extent to which my objectives were accomplished. It closes by explaining how this thesis contributes to the fields of both Conservation Ecology and Sustainable Development and Adult Education.

CHAPTER 2

WATER MANAGEMENT IN GEORGIA

Georgia began building its water management program with laws, regulations, policies, and programs in the late 1960s and early 1970s, when its population was approximately 4.5 million people (U.S. Census Bureau 1995). During this time, there was very little mechanical agricultural irrigation, much less impervious cover, plentiful supplies of potable water, limited municipal wastewater treatment, and little historical monitoring of water quality and quantity (Caldwell 2005). The population of Georgia was estimated at 8.8 million in 2004; it is projected to be 12 million in 2030 (U.S. Census Bureau 2005). With this continuing population growth, land uses will continue to change, and the state will approach its water quantity and assimilative capacity limits.

This chapter provides an overview of Georgia's current water management approach, including a brief history of water planning in Georgia. It discusses the problems resulting from uncoordinated management and the need for a comprehensive statewide water management plan. It summarizes the legislative actions taken towards developing a comprehensive water management plan and the passage of House Bill 237, which enables the development of Georgia's first Comprehensive Statewide Water Management Plan. It discusses Georgia EPD's plan development and public participation processes. Recognition of the complexity of water management in Georgia and the significance of the Comprehensive Statewide Water Management Plan will underscore the need for educational materials to help those who are involved both directly and indirectly in the planning process participate more effectively.

Overview of Georgia Water Law

Water planning and management is carried out by all levels of government, from the federal to the local level, and both federal and state statutes provide the foundation for Georgia's water management program. The federal government historically focused on major flood control, navigation, and hydroelectric power projects. State management efforts have focused more specifically on protecting water quality and quantity. Federal directives drive some state laws, while others are specific to Georgia.

The federal government passed two important pieces of legislation in the early 1970s related to water quality protection. The passage of the 1972 Federal Water Pollution Control Act Amendments, or the Clean Water Act, set federal standards for restoring and protecting the quality of the nation's waterways. This landmark legislation established a national goal of having "fishable and swimmable" waters in the United States by 1977. In 1974, the federal government passed the Safe Drinking Water Act, which established national drinking water standards. Both pieces of legislation stimulated planning activities on the state and local levels, and the federal government provided technical assistance and funding to help states reach the goals. Other federal statutes that guide Georgia's water management program are the National Environmental Policy Act of 1969, the Coastal Zone Management Act of 1972, and the Endangered Species Act of 1973.

Georgia's current water management program has taken shape over the past 30 years with various laws enacted by the Georgia General Assembly. The resulting policies and programs are carried out primarily by the Georgia Department of Natural Resources (DNR) and its Environmental Protection Division (EPD). The Executive Reorganization Act of 1972 assigned the responsibilities of over 30 agencies and departments to the newly created Georgia

DNR. EPD was assigned all water resource responsibilities under federal and state law. Through laws and subsequent regulatory programs, EPD is responsible for regulating surface and groundwater withdrawals, the disposal and reuse of treated wastewater, drinking water systems, stormwater runoff from development sites, industrial and municipal stormwater runoff, installation of wells, underground injection of wastes, and land uses in aquifer recharge areas and water supply watersheds (BNR 2001).

Georgia's water protection laws have developed in two different ways: some came from federal directives and others were passed by the General Assembly to address specific management problems as they arose. Georgia enacted its first water protection law in 1964, the Georgia Water Quality Control Act (O.C.G.A. § 12-5-20), which requires the state to assume responsibility for water quality and quantity by developing and periodically revising water quality standards. The Ground Water Use Act (O.C.G.A. § 12-5-90) was passed in 1972. This Act protects aquifers, prevents pollution, establishes priorities, and coordinates functions within EPD to ensure that high-quality groundwater is available for future generations. The Act created a permitting system for water withdrawals of groundwater exceeding 100,000 gallons per day, although agricultural interests were exempt from these requirements. The Georgia Safe Drinking Water Act (O.C.G.A. § 12-5-170) was passed in 1977 to assure safe drinking water for all Georgia citizens.

In 1977, Georgia amended the Water Quality Control Act of 1964 to include surface water withdrawal permitting requirements similar to those under the Ground Water Use Act. At that time, agricultural water uses were also exempted from these permitting requirements. In 1988, the state established a permitting procedure for agriculture withdrawals. Georgia EPD is responsible for issuing permits for irrigation water uses of more than 100,000 gallons per day,

and the permit is transferable with the land to subsequent owners. There are significant differences in the permitting system for agricultural uses compared to other water uses. Agricultural water withdrawal permits have no expiration date, need not be renewed, and cannot be revoked for nonuse due to the variation of irrigation needs. Currently EPD manages approximately 22,000 agricultural withdrawal permits, compared to 750 municipal and industrial permits (Christy 2003).

There are additional statutes that are issue- or resource-specific that must be considered when developing a comprehensive water management plan in Georgia. The Georgia Erosion and Sedimentation Control Act (O.C.G.A. § 12-7-1) establishes and implements a statewide program to protect Georgia's waters from soil erosion and sedimentation deposition. The Safe Dams Act of 1978 (O.C.G.A. § 12-5-370) provides for the inventory, classification, inspection, and permitting of dams to protect the health, safety, and welfare of Georgia's citizens. The Coastal Marshlands Protection Act of 1970 (O.C.G.A. § 12-5-280) creates a committee to evaluate proposed construction or development projects that may impact coastal marshlands. The Georgia Water Well Standards Act (O.C.G.A. § 12-5-120) gives Georgia EPD the authority to regulate individual, industrial, irrigation, and nonpublic water wells.

The first attempt to implement water planning programs statewide came with the passage of the River Basin Planning Act in 1992 (formerly O.C.G.A. § 12-5-520 to 525). The mission statement for that program was "to develop and implement a river basin planning program to protect, enhance, and restore the waters of the state of Georgia that will provide for effective monitoring, allocation, use, regulation, and management of water resources." Associated with this mission were a variety of goals which emphasized coordinated planning necessary to meet all applicable local, state, and federal laws, rules, and regulations, and provide for water quality,

habitat, and recreation. Due to a lack of funding and political will, some river basin plans were never completed. Now the River Basin Planning Act is superseded by the Comprehensive Statewide Water Management Planning Act, which will be discussed in detail later in this chapter.

In addition to federal and state initiatives for water management, some local governments have ordinances or regulations that help maintain the water quality in local streams. These regulations govern riparian buffers, zoning, septic tank maintenance, and land disturbing activities. For example, the city of Alpharetta has an erosion and sedimentation ordinance that requires 100-foot buffers on all perennial streams and allows flexibility in buffer width along nonperennial streams, as long as a 50-foot minimum and 100-foot average is maintained. The city requires an impervious surface setback of a minimum of 75 feet and an average of 150 feet. Septic tanks and drain fields are prohibited within the buffer (Wenger and Fowler 2000).

Georgia's complex water management program grew out of disparate attempts to manage specific water issues rather than dealing proactively with water issues as a whole. Often there are inconsistencies and a lack of coordination between federal and state laws, policies, and programs. Laws are passed at different times by separate legislative bodies, each with their own motivations and intentions. The laws are implemented by federal and state agencies, which vary in their financial, technical, and managerial capacities. Local government officials, private sector institutions, and the public then make specific water-related decisions reflecting these policies and programs. It is difficult to assure coordination and avoid inconsistencies given this situation. These problems have been exacerbated by the dramatic population growth the state has experienced in the past 20 years.

Georgia's Need for a Comprehensive Statewide Water Management Plan

Seven factors underscore the need for a comprehensive water management approach in Georgia. These factors are as follows: geology and hydrology, weather and climate, population and economic growth, neighboring states, the federal courts, knowledge and technology, and the value of water (Kundell 2005).

Geology and hydrology

The first factor is Georgia's unique geology and hydrology. Georgia is comprised of five physiological provinces, which vary in bedrock, soil, and topography. This results in an uneven distribution of water resources. Based on its water resources and issues, Georgia can be separated into two distinct regions – North Georgia and South Georgia (Kundell 2005). Figure 2:1 is a map of Georgia, highlighting the river basins, groundwater regions, and metropolitan statistical areas.

North Georgia is characterized by greater dependence on surface water. There is very little groundwater because of the hard, crystalline rock that underlies the region. However, there is also limited surface water available because of the small streams that originate in this region, and there is limited natural storage of water because the natural barriers that would impede flow have eroded away. There are no natural lakes, and damming smaller streams to form reservoirs continues as a water supply means. North Georgia is the major urban and industrial area of the state, which creates a high demand for water.

South Georgia, by contrast, has larger rivers and extensive aquifers. The aquifers are artesian, meaning they are under pressure. When large quantities of groundwater are withdrawn in one location, this can cause problems in other locations due to the decline in water levels or

Figure 2:1 – River Basins, Groundwater Regions, and Metropolitan Statistical Areas in Georgia

Source: Kundell and Tetens 1998.

from saltwater drawn in to the pumping zone (Kundell 2005). Another problem South Georgia faces is the lack of surface water from the rivers reaching the coastal estuaries, which are breeding, nursing, and feeding grounds for many aquatic species. This region also supports the $21 million commercial fishing industry on the coast of Georgia (World Almanac for Kids Online 2003).

Weather and climate

Weather and climate are factors that must be considered when developing a water management plan for Georgia. Georgia is a humid and wet state with an average rainfall of 50 inches per year, ranking fifth in the United States (Kundell and Tetens 1998). However, floods

and droughts have affected water resources and their use. In the past two decades, Georgia has experienced two of the worst droughts on record, a 100-year flood, and a 500-year flood (Kundell 2005). The drought of 1998-2001 had a profound impact on the state's municipal and agricultural water systems. During the summer of 2000, 23 cities and five counties faced critical shortages, and the U.S. Department of Agriculture declared all 159 counties in Georgia disaster areas due to drought (BNR 2001). Drought and flood planning are critical components of comprehensive planning to reduce the impacts and minimize the need for emergency relief.

Population and economic growth

The increase in population and economic growth in Georgia has contributed to stress on the state's water resources. From 1990 to 2000, the population in Georgia increased 26.4%, compared to the national increase of 13.1% (U.S. Census Bureau 2006). The population is projected to approach 12 million in the next 25 years (U.S. Census Bureau 2005).

Another problem is the location of the population growth. The two fastest growing areas are the Atlanta metropolitan area, which is characterized by limited water resources, and the Georgia coast, which is facing saltwater intrusion problems in its major groundwater source, the Floridan Aquifer. As the population increases in these areas and the rest of the state, the demand for water for economic growth also increases to support Georgia's expanding industrial and commercial activities (Kundell 2005).

Neighboring states

Neighboring states play a role in the need for a statewide water management plan, because many of Georgia's water resources are shared with other states. All but three of Georgia's fourteen major river basins are shared with neighboring states. Additionally, the Floridan Aquifer, Georgia's major groundwater resource, is shared with Florida, Alabama, and

South Carolina. The interstate concern over water use in the Apalachicola-Chattahoochee-Flint (ACF) River Basins between Florida, Alabama, and Georgia, and in the Alabama-Coosa-Tallapoosa (ACT) River Basins between Alabama and Georgia sparked a dispute, or "water war," in 1990 with a lawsuit between Georgia, Alabama, and Florida regarding the apportioning of water in these two basin systems (Kundell and Tetens 1998). These negotiations remain unresolved today. Both of these river basin systems originate in North Georgia and supply water to the Atlanta metropolitan area. These systems are critically important to Georgia because they comprise 38% of the state's total land area, provide drinking water to 60% of the population, and supply water to more than 35% of the irrigated agriculture in Georgia (BNR 2001). On other borders, Tennessee and South Carolina have also expressed concern over shared water resources.

Federal courts

Without the foundation of a comprehensive water management plan, many decisions about water management are being decided in court, which is time-consuming and costly. The state has been involved in litigation over groundwater use in coastal Georgia, interstate apportionment, and water quality protection. According to the U.S. Constitution, the federal courts are responsible for resolving interstate conflicts over shared water resources, and courts at all levels are becoming involved in water management decisions (Kundell 2005).

Knowledge and technology

It is critical that Georgia's current water management program is examined in light of recent scientific and technological findings. Scientific research has provided greater knowledge about the functions of water resources and the need for healthy aquatic systems. New information is being communicated to the public through educational and training programs, the

media, and the Internet. Improved knowledge has led to advances in technology, such as how water users can obtain, transport, treat, use, and conserve water (Kundell 2005).

An example of improved technology is the use of variable-rate irrigation (VRI) systems. The center pivot is commonly used for irrigation in Georgia. However, farmers have little control over the amount of water the nozzles spray and the location of the spray. VRI technology allows farmers to apply water when and where it is needed by using computer maps, sensors, and software to control the location and the amount of water sprayed on crops. Scientists from the University of Georgia have tested the water efficiency of VRI systems on three fields in Georgia. By allowing the farmers to water their crops with the correct amount for optimal yield, their water use was reduced by 8%-20% in each year. Considering there are approximately 10,000 center pivots in Georgia, VRI technology could help decrease the demand for water for irrigation and improve crop productivity in South Georgia (Haire 2005).

Value of water

With the growing demand for water in the state, the value of water has increased. Cities and counties need clean water for drinking water supply and to attract economic opportunities. Industrial and agricultural production depends on water. Power companies generate energy from peak flows of water through dams. All living organisms require water for survival. Water resources provide habitat, nurseries, and refuge for plants and animals – both aquatic and terrestrial. Water provides social, cultural, and aesthetic values. Recreational activities rely on an abundant supply of clean water (Kundell 2005). For example, water is critical to the hunting and fishing industries of the state. There are approximately 417,000 hunters and 1.2 million anglers in Georgia who spend over $1 billion annually on direct expenditures, including equipment, food, lodging, and transportation. The hunting and fishing industries provide 10,000

jobs in the state (Waller 2005). The key to comprehensive water planning is to balance these many demands for water.

Problems Resulting from Uncoordinated Water Management

Over the years, state and federal officials have made attempts to alleviate water management concerns through isolated management approaches. These piecemeal solutions, however, do not attend to the complexity of the situation. Water quantity and quality are closely related; however, past planning programs have often considered the two separately. Surface and groundwater management directly affect one another, but the laws governing these two water sources are separate. Uncoordinated water management results in inevitable conflicts that hinder the overall success of the management program. Below are two examples of uncoordinated management efforts.

1. Regional management efforts

Several regional water management efforts are taking place in Georgia. The Coastal Georgia Sound Science Initiative, a seven-year study completed by EPD at the end of 2005, addresses the concern that the pumping of groundwater in the region is allowing saltwater to seep into the Floridan Aquifer. The Flint River Regional Water Development and Conservation Plan, announced in October 1999 and completed in December 2005, was initiated in response to hydrogeologic studies suggesting that water flows in the Flint River and its tributaries are being severely impacted by agricultural irrigation. The Metropolitan North Georgia Water Planning District, introduced in 2001, was given two years to develop plans addressing three water concerns – wastewater, stormwater, and water supply and conservation – for the 16-county region of metropolitan Atlanta.

Ideally, these regional plans would have been developed after a statewide water management plan was in place to help guide policy and management decisions. Because large amounts of money and political will have been invested in these regional studies, they must be incorporated into the Comprehensive Statewide Water Management Plan. However, it is more difficult to frame a statewide water plan around regional plans because then broader statewide objectives must take into account regional decisions that have already been made. It would have been better to decide on comprehensive statewide objective first and then create regional plans based on that broader framework. Also, regional water planning is best accomplished with respect to river basin boundaries as opposed to political boundaries. The Metro District's plans are based on political boundaries, which include portions of five separate river basins – three flowing to the Gulf of Mexico and two flowing to the Atlantic Ocean.

For example, one major water issue in Georgia is the way that the exploding demand for water supply in Metro Atlanta impacts water quantity and quality in downstream regions of the state. Regional planning in Atlanta or any other region will not be able to effectively deal with this type of issue. These issues can only be dealt with on a statewide level. It would be better to have a statewide plan so that regional plans can be designed within a statewide framework.

2. Water quality protection

Uncoordinated water management has been a problem in water quality protection because past efforts have focused primarily on controlling contamination through point source discharges while failing to control nonpoint source pollution. The point source controls have been highly successful at reducing contaminants in waterways. However, knowledge about contamination from nonpoint sources has increased. As land use changes, the contaminants from nonpoint source pollution are increasing, which negatively affects the health of streams, rivers,

and lakes. The Georgia Erosion and Sedimentation Control Act falls short of properly managing nonpoint source pollution. It only addresses runoff from specific construction activities and does not directly address the relationship between post-construction land use and nonpoint source pollution. It does not address a variety of nonpoint source pollutant types, such as nutrients, heavy metals, and synthetic organic compounds. The Act spreads responsibilities across several state agencies and local governments who wish to implement the guidelines in their jurisdictions (Kundell 2005).

Efforts made by the federal government to control nonpoint source pollution are helping improve the quality of waterways. In 1990, the U.S. Environmental Protection Agency (EPA) developed Phase I stormwater requirements, which resulted in the first National Pollution Discharge Elimination System (NPDES) Stormwater Discharge Associated with Construction Activity General Permit, also known as the General Permit. Also, a federal court order requires U.S. EPA, through Georgia EPD, to develop total maximum daily loads (TMDL) to bring streams that do not meet water quality standards into compliance with the Clean Water Act. However, 60% of surveyed river miles and 84% of surveyed lakes in Georgia are impaired, with urban runoff and other nonpoint sources as a major cause of impairment (U.S. EPA 2002).

To improve the efforts to control nonpoint source pollution in Georgia, the 2003 General Assembly passed House Bill 285, which coordinates erosion and sedimentation control requirements under the state law with the NPDES permitting requirements under the federal Clean Water Act. While this legislation will result in better coordination among agencies, it is critical that federal, state, and local officials, along with developers and private landowners, work together to make sure that these requirements are fulfilled (Kundell 2005). Hopefully improved coordination as a result of this legislation will lead to improved water quality.

When water management initiatives change in an uncoordinated manner, there are inevitable conflicts between the intended goals and the rules, programs, and policies that are in place to achieve these goals. Fortunately, Georgia now has the opportunity to review its current water management program through a comprehensive approach, which is rarely an option due to the cost and time commitment.

Legislative Efforts Towards Georgia's Comprehensive Statewide Water Management Plan

Georgia began the process of developing a comprehensive statewide water management plan during the 2001 session of the Georgia General Assembly. The passage of Senate Resolution 142 called for the formation of a Joint Water Plan Study Committee and Advisory Committee to recommend how the state should address its water resource issues in the form of a comprehensive water plan. The 23-member Joint Study Committee consisted of ten legislators, five appointees from the Governor, two appointees from both the Speaker of the House and the Lieutenant Governor, and four agency heads. The 50-member Advisory Committee included representatives from the following interest groups: scientific, business, agriculture, environmental, academic, water professions, outdoor recreation, commercial fisheries, and the 14 river basins in Georgia.

The Joint Study Committee established the following mission statement: "Georgia manages water resources in a sustainable manner to support the state's economy to protect public health and natural systems, and to enhance the quality of life for all citizens" (JSC 2002). The Committee was charged with two major policy decisions – establish a planning framework and establish policy direction needed for the water planning process to move forward. On August 27, 2002, the committee adopted the *Final Report of the Joint Study Committee*, consisting of 35

recommendations regarding the comprehensive planning framework, state and regional water management options, interbasin transfers, and water rights structure (JSC 2002).

The *Final Report*, however, was highly contentious because the Joint Study Committee voted to weaken the eight guiding principles submitted by the Water Rights Working Group. First, the Joint Study Committee removed the first guiding principle of the Water Rights Working Group that maintains that "[t]he waters of the State are a public resource managed by the State in the public interest…" Second, the Committee weakened the remaining seven guiding principles by changing a key introductory word from "apply" to "consider." These principles, which are Recommendation 26 in the *Final Report*, address such topics as reasonable use, safe yield, minimum flows, and conservation – topics that many consider environmental safeguards. These changes resulted in a Minority Report submission by a committee member, which is Appendix D in the *Final Report* (JSC 2002).

In 2003, the members of the General Assembly introduced a bill based on the recommendations of the Joint Study Committee that was heavily debated among diverse stakeholders. The original version of House Bill 237 called for a top-down approach to water planning, measuring and reporting of agricultural water use, restrictions on interbasin transfers except for in the sixteen Atlanta metropolitan counties, and voluntary transfers of water withdrawal permits – the latter two being most controversial. First, interbasin transfers can have significant effects on the natural hydrograph in the interbasin transfer's basin of origin and the basin of receipt, with systemically lower and higher flows in each respective basin. Opponents felt the restrictions either went too far or not far enough. The exemption of Metro Atlanta was particularly contentious because growth in Atlanta is a major factor in the discussion of interbasin transfers. In addition, the metropolitan district spreads over five river basins;

therefore, removing water from these basins could have significant impacts on downstream communities throughout the state. Second, the water permit transfer provision was viewed by opponents as an attempt to undo the existing legal structure of water rights which maintains that water belongs to all the people of the state who have a right to reasonable use.

House Bill 237, which received much attention by initiating a controversial discussion of water rights in Georgia, was debated in both the House and the Senate, and different versions of the legislation were passed in both chambers. Consequently, the legislation was sent to a conference committee, consisting of three members of each chamber, for revision. The conference committee version of House Bill 237 was rejected on the final day of the 2003 session because the committee failed to remove the controversial subject of water permit trading, resulting in the House voting down the conference committee version, 60 to 105.

Bills that are not passed during the first year of the two-year legislative term remain alive for the next session; therefore, House Bill 237 was sent back to the conference committee for further work between sessions. Although the bill did not pass in 2003, widespread support remained for developing a comprehensive statewide water management plan and for measuring and reporting agricultural water uses. A separate bill, House Bill 579, was passed earlier in the 2003 legislative session specifically related to metering and monitoring agricultural water uses.

Understanding the need to develop a comprehensive statewide water management plan, legislators removed language on the subjects of water permit trading and interbasin transfers from House Bill 237. A version of House Bill 237 containing only the planning framework section passed during the 2004 session of the General Assembly, receiving support from all parties.

The Georgia Water Coalition and its Involvement

The Georgia Water Coalition (GWC) played an instrumental role in the 2003 General Assembly session. The GWC, formed in 2002, is a diverse group of organizations united by the goal of protecting and caring for Georgia's waters – "an essential ingredient to strong property values, clean water for drinking, recreation, fish and wildlife, and Georgia's continued prosperity." Presently, the GWC is comprised of 132 organizations, representing approximately 275,000 Georgians. The GWC's ongoing mission is to create even broader awareness during the development of the Comprehensive Statewide Water Management Plan.

An assertive and energetic campaign by the GWC to inform citizens and local governments of the implications of permit trading resulted in an outcry against this provision. At the suggestion of the GWC, city councils and county boards of commissioners passed 182 resolutions rejecting permit trading across the state. The GWC was critical in ensuring the passage of House Bill 237 in the 2004 legislative session as a plan-development-only bill.

Several state officials noted that the elimination of the water permit trading provision from the legislation was the result of the most successful and concerted effort ever undertaken by the state's conservation community. Former Governor Roy Barnes said, "I have never seen anything like this in politics. This is truly an example of the people rising up to defeat the wishes of the rich and powerful. Savor it because it is rare" (GWC 2004). Former Lieutenant Governor Pierre Howard remarked, "Congratulations are in order to the Georgia Water Coalition for its advocacy against water marketing in Georgia. Last year, you prevailed in the General Assembly against 'all the kings horses and all the kings men.' But just as importantly, in the interim, our partners across the State have accomplished something truly monumental: one hundred resolutions of local governments against water marketing! I wish that I could shake the hand of

each person who worked for this cause and thank him or her personally. We have seen democracy at its best, with policy being made from the ground up by the people … Our partners have participated in an historic effort that has changed the environmental policy of Georgia for years to come …" (GWC 2004).

Developing Georgia's Comprehensive Statewide Water Management Plan

In 2004, the Georgia General Assembly passed House Bill 237 – the "Comprehensive Statewide Water Management Planning Act" – which focused solely on the development of a comprehensive statewide water management plan (O.C.G.A. § 12-5-520 to 525). The legislation creates a framework for developing the water plan by providing an overall vision and a set of guiding principles. The overall vision is as follows: "Georgia manages water resources in a sustainable manner to support the state's economy, to protect public health and natural systems, and to enhance the quality of life for all citizens" (O.C.G.A. § 12-5-522 (a)).

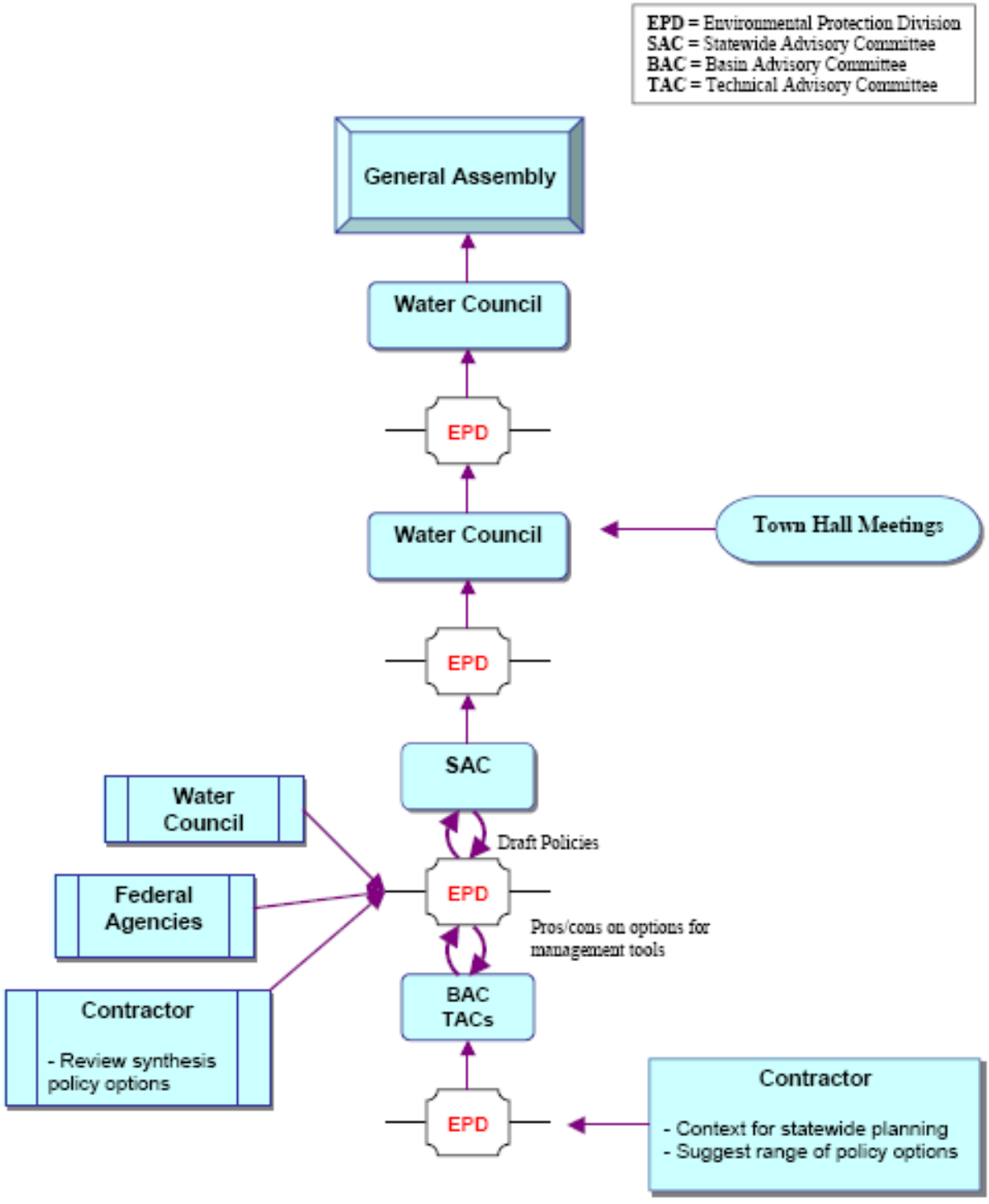
Two overarching water management goals guide plan development: (1) meeting future water needs while protecting aquifers, instream uses, and downstream users, and (2) meeting public health and environmental needs. The water plan is organized around four water management objectives: (1) minimizing water withdrawals, (2) maximizing returns to river basins, (3) meeting instream and offstream needs, and (4) protecting water quality.

The water planning process will accomplish several objectives. First, it will evaluate trends and conditions to determine the challenges faced now and in the future. Second, it will evaluate current statutes, rules, programs, and policies to address the challenges. Third, it will identify gaps and weaknesses in the current structure. Finally, it will identify policy options for addressing gaps and weaknesses and weigh the benefits and drawbacks of each option.

The legislation established the fourteen-member Georgia Water Council, consisting of eight agency heads, four non-voting legislators, and two at-large members appointed by the Speaker of the House and the Senate President Pro Tempore. The Water Council will oversee the planning process, provide input to EPD throughout the development of the plan, and make the final decisions before submitting the water plan to the 2008 General Assembly. The statewide water plan will be presented to the Water Council for review, modification, and final approval before July 1, 2007 (O.C.G.A. § 12-5-524). The Water Council will deliver the final statewide water plan to the 2008 General Assembly to be considered for adoption through a Joint Resolution. If the General Assembly rejects the plan, the Water Council may submit alternative plans for approval no later than the 20th day of the 2008 session. If the General Assembly rejects the alternative plans submitted up to the 20th day, then it may enact a statutory water plan. If no water plan is approved by July 1, 2008, then the most recent plan submitted by the Water Council becomes law (O.C.G.A. § 12-5-525).

A guiding principle of the legislation is to "involve meaningful participation, coordination, and cooperation among interested and affected stakeholders and citizens as well as all levels of governmental and other entities managing or utilizing water" (O.C.G.A. § 12-5-522 (b)(8)). Georgia EPD has designed a public involvement process that involves over 250 individuals, serving on three types of advisory committees – a Statewide Advisory Committee, Basin Advisory Committees, and Technical Advisory Committees. Figure 2:2 shows EPD's public involvement process. EPD requested nominations for individuals to serve on these committees and made selections at the end of 2005. Committee members do not have decision-making authority and receive no financial compensation for their involvement. Their purpose is to receive information provided by EPD and offer input and advice to EPD on a range of

Figure 2:2 – Georgia EPD's Public Involvement Process



Source: EPD 2006.

management objectives and policy tools. EPD has hired professional facilitators to assist the committees with achieving the goals of each meeting.

The Statewide Advisory Committee (SAC) consists of 32 representatives from organizations with statewide constituencies. The SAC is responsible for providing EPD with a statewide perspective and input on the overarching management goals, objectives, and new policy tools. The SAC will review EPD's policy toolbox and sub-state planning framework before these recommendations are formally submitted to the Water Council.

There are eight Basin Advisory Committees (BACs), representing six river basin regions, the coastal aquifers, and the Atlanta metropolitan area. The BACs are composed of 187 members from the following interest groups: academic, agricultural, conservation, existing regional water organizations, industrial, instream users, municipal and county, recreational, regional development centers, and upstream and downstream users. Their primary purpose is to provide regional perspectives and input on water management objectives and new policy tools.

The Technical Advisory Committees (TACs) consists of experts with scientific, technical, and practical experience who are actively working on or researching the topics being addressed in the water plan. Their purpose is to provide early input on specific technical questions needed to inform the policy options. TAC members are working with EPD staff to build the scientific and technical foundation upon which to develop policy options. To date, there are three TACs – water conservation, water reuse, and target flow regimes. EPD expects to organize more TACs as planning progresses.

In addition to the advisory committees, there will be a series of town hall meetings. These meetings will provide concerned citizens with the opportunity to provide input. The first round of town hall meetings will take place during the summer of 2006, and the public will have

the opportunity to review the recommendations for the first two management objectives – minimizing water withdrawals and maximizing returns to river basins. The second round of town hall meetings will take place early in 2007, and the public will have the opportunity to review the last two management objectives – meeting instream and offstream needs and water quality. To date, little information is known about the town hall meetings, including how many will take place and their locations.

The financial support for the planning process includes state and federal appropriations. EPD estimated that it would take $25 million to $30 million to complete the Comprehensive Statewide Water Management Plan. However, since 2004, Governor Perdue and the General Assembly budgeted only a fraction of that. The total budget is $1,530,000 for the next two years, with $840,000 from state appropriations and $690,000 from the Federal Drinking Water State Revolving Fund. Because of the lack of funding, ambitions were scaled back, and this first installment of the plan will only address the policy framework.

The public involvement process designed by Georgia EPD is one of the largest ever undertaken by a state agency in Georgia. If well coordinated, the public involvement process has the potential not only to improve the quality of decision making in the planning process, but also to help EPD develop a plan that will be supported by a broad spectrum of Georgia citizens.

CHAPTER 3

PUBLIC PARTICIPATION IN ENVIRONMENTAL DECISION MAKING

Public participation is now a widely accepted component of environmental decision making. It is a valuable tool for developing ownership, partnerships, understanding, and commitment, which are all indispensable to implementing policy recommendations (Tuler and Webler 1999). While public participation is not a panacea for economic and social problems, it does generate new knowledge and ideas that are capable of "creating and legitimizing new interests, reshaping our understanding of existing interests, and in the process, influencing political pathways along which power and interests travel" (Fischer 2000, xii).

Chapter Three provides an overview of public participation, including when and why it was adopted in U.S. policymaking, the benefits, why people choose to get involved or not get involved, and the characteristics of an effective public participation program. It includes a summary of public participation techniques, including how to get information to and from the public, and factors that influence participation. This chapter concludes by emphasizing the need for public education throughout the participation process.

Defining Public Participation

According to James Creighton, founding president of the International Association for Public Participation, public participation is a "process by which concerns, needs, and values are incorporated into governmental and corporate decision making" (2005, 7). The overall goal is to find solutions that are supported by the public through two-way communication and interaction (Creighton 2005). Public participation offers mechanisms designed to involve the public or their representatives in administrative decision making. These mechanisms range from town hall

meetings where citizens voice their opinions to formally mediated negotiations where citizens actually draft regulations (Beierle and Cayford 2002). Aliases for public participation include 'stakeholder' or 'community' involvement (Beierle and Konisky 2000).

Creighton surveyed other definitions of public participation and found that most have at least the following components (2005):

- Public participation pertains to administrative decisions. These decisions are typically made by agencies, not by elected officials or judges.
- Public participation not only provides information to the public, but also fosters interaction between the agency and citizens who are participating.
- Public participation does not happen accidentally or coincidentally. Rather, it occurs through an organized process for public involvement.
- Participants have some ability to influence the decision being made.

The level of authority participants have in the decision-making process varies considerably. Some processes empower citizens to have a high degree of influence, whereas others significantly limit that influence. For example, notice and comment procedures, which are heavily relied upon in administrative rulemaking, do not require agencies to give up any decision-making authority. In contrast, recent innovations in public participation processes, such as round tables or collaborative watershed management efforts, are more deliberative in nature, granting broader authority to citizens to make decisions on issues affecting their communities (Konisky and Beierle 2001).

To understand the various levels of public involvement that may be incorporated into a decision-making process, one must begin with Sherry Arnstein's (1969) seminal work that proposes a "ladder of citizen participation," a theoretical framework for public involvement

based on an eight-rung ladder (Figure 3:1). This ladder serves as an analytical grid used to evaluate forms of public participation and examine the authority given to citizens in the decision-making process. The degree of citizen empowerment in a decision-making process can range from none to de facto absolute. According to Arnstein, rungs one and two are non-participative, aiming to educate participants. Rungs three and four represent information sharing, although frequently the emphasis is on one-way flow with no channel for feedback. At rung five, the public can advise, but still does not share any decision-making authority. Rungs six through eight represent some degree of citizen power. At rung six, power is redistributed through negotiation between citizens and power holders, and planning and decision-making responsibilities are shared. At rung seven, citizens hold a clear majority on committees with delegated decision-making powers, and the public has the power to assure accountability. Rung eight represents full citizen control of planning, policymaking, and managing a program. The higher the level of public involvement, the more influence the public has on the decision (Arnstein 1969).

Figure 3:1 – Ladder of Citizen Power in Participatory Processes

Rung 8	Citizen control	***Degrees of citizen power***
Rung 7	Delegated power	
Rung 6	Partnership	
Rung 5	Placation	***Degrees of tokenism***
Rung 4	Consultation	
Rung 3	Informing	
Rung 2	Therapy	***Nonparticipation***
Rung 1	Manipulation	

Source: adapted from Arnstein 1969.

A History of Public Participation in Environmental Decision Making

Public participation challenges the traditional management of government policy by experts within administrative agencies. From the late nineteenth century to the middle of the twentieth century, the managerial model, one that entrusts administrators to identify and pursue the common good, dominated public administration in the United States. Beginning in the 1930s, the size, scope, and complexity of government responsibilities rapidly increased in all levels of government, touching more aspects of people's lives. Along with this growth came large professional bureaucracies to manage these responsibilities, and decisions previously made by elected officials in a political process were delegated to technical experts within these bureaucracies. A challenge for administrative governance is balancing the need for expertise in managing administrative programs with the transparency and participatory characteristics of a democratic system (Beierle and Cayford 2002). Kerwin (1999) argues that the vast expansion of social regulation through government programs has brought the tension between the government and previously unorganized interests to a head throughout history, each time resulting in new legislation supporting public participation.

For example, the New Deal of the 1930s drastically increased the power of the executive branch in the economy. Under the New Deal model, experts were perceived to have the answers to all social problems, and new agencies were formed to serve as repositories for this expertise. The New Deal incited legislative action with the passage of the Administrative Procedure Act (APA) in 1946. This cornerstone for public participation in administrative governance continues to guide all regulatory proceedings. The APA establishes a process for federal agencies to use during rulemaking by requiring agencies to provide public notice about proposed rules,

information about the rules, opportunity for public comment on the rules, and judicial review of the rulemaking process (Beierle and Cayford 2002).

The growing challenges in the managerial model and the tension between expertise and accountability were exacerbated by increasing skepticism that experts could make decisions between competing interests that society views as "good," such as affordability, equity, environmental protection, and safety (Beierle and Cayford 2002; Creighton 2005). Pluralism replaced managerialism as the dominant paradigm of administrative decision making (Stewart 1975; Reich 1985). In the pluralism model, administrators are arbiters among different public interests, not objective decision makers in the public interest. The managerial perspective identified the ultimate social goal as the maximization of social welfare. Pluralism, however, does not recognize the public good in an objective sense. Instead, a public good was to be arrived at through debate and negotiation among affected interests (Williams and Matheny 1995).

Pluralism thrived as public participation legislation followed the expansion of government under President Lyndon Johnson's Great Society initiatives in the 1960s. The Great Society was a set of domestic programs aimed at ending poverty and racial injustice. Among the Great Society initiatives are the Voting Rights Act of 1965, the establishment of the Department of Housing and Urban Development, and programs such as Medicare, Medicaid, Job Corps, Head Start, and Upward Bound. Through the late 1960s and mid 1970s, Congress passed several laws, which greatly increased citizens' access to government information and decision making, such as the Freedom of Information Act in 1966 (Beierle and Cayford 2002). The Freedom of Information Act gives citizens access to most records under government control, which greatly increased openness in government. The major environmental statutes of the 1970s were

"pluralist-created and pluralist-driven," including provisions for public review and citizen suits (Gauna 1998, 24).

In recent years, an even more participatory perspective has put pressure on the pluralist model. This "popular" democratic theory emphasizes the importance of the act of participating, which influences decisions as well as strengthens civic capacity and social capital (Beierle and Cayford 2002). Like pluralism, popular democracy stresses interaction among competing interests, but the interaction is viewed as a way to identify the common good and act on shared communal goals instead of a competitive negotiation (Dryzek 1997). According to Laird (1993, 345), participation under the popular democratic perspective "makes people more aware of the linkages between public and private interests, helps them develop a sense of justice, and is a critical part of the process of developing a sense of community." In environmental policymaking, the popular perspective focuses on the role that communities play in environmental protection, leading to environmental management innovations such as civic environmentalism and community-based environmental protection (Beierle and Cayford 2002).

Public participation is central to civic environmentalism and community-based environmental protection. Civic environmentalism emphasizes collaborations and deliberation among various communities, interest groups, and government agencies to tackle local problems, such as nonpoint source pollution, through a framework that encourages civic education and responsible action. Community-based environmental protection takes a more holistic approach by addressing the health of the ecosystem and human behavior within the ecosystem, instead of focusing on a particular problem. (Beierle and Konisky 2000).

The need for greater public involvement in environmental decision making continues to be emphasized by leaders at all levels of government and in recent high profile reports. In a

report from the National Research Council (1996), organizations are called to broaden participation in activities usually restricted to experts. In a report by the Presidential/ Congressional Commission on Risk Assessment and Risk Management (1997), engaging stakeholders is viewed as central in the Commission's risk management framework. Environmental agencies continue to open the door to greater participation in their programs. Public participation is a key element of the U.S. Environmental Protection Agency's reinvention activities under the Clinton administration, the U.S. Department of Energy's efforts to clean up nuclear weapons facilities, and many agencies' attempts to deal with litigious natural resources issues. The push for more participation is driven by significant optimism about its ability to improve the substantive and procedural quality of decisions (Beierle and Konisky 2000).

Benefits of Public Participation

There are several reasons why public participation is a vital part of a decision-making process. First, it creates a direct relationship between the public and the bureaucratic decision makers and establishes a dialogue between the two before decisions are made. Second, it provides a way of channeling conflict into dialogue among people with different viewpoints, ensuring genuine interaction and reassuring the public that all viewpoints are being considered. From the public perspective, public participation increases their impact on the decisions that affect their lives. From the perspective of government officials, public participation provides a process by which contentious issues can be settled (Creighton 2005). Finally, public participation and deliberation give meaning to democracy. If democracy is to be taken seriously, citizens must have the opportunity to deliberate on decisions affecting their lives (Fischer 2000).

There are numerous benefits associated with involving the public in environmental decision making. Beierle and Cayford (2002) identify five social goals that can be accomplished

through public participation. Creighton (2005) examined approximately 300 public participation cases and categorized his findings into the eight benefits of public participation. The following list of nine benefits is a synthesis of Beierle and Cayford's (2002) social goals and Creighton's (2005) benefits.

Benefit 1: Incorporating public values into decisions

Incorporating public values into decisions is fundamental to democracy. The failure to incorporate these values is a primary reason for the challenge to the managerial model, which recognizes only a limited set of public values (Beierle and Cayford 2002). Values choices involve assigning a weight or priority to one thing society thinks is good compared to another thing society thinks is good. Decisions, such as the levels to which health and safety risks are acceptable or the amount that is reasonable to pay to protect a natural resource, are about values or philosophy. Technical expertise and scientific study may lead to more informed decisions, but expertise does not ultimately provide a basis for making fundamental decisions related to values. The intent of democracy is to give people power over decisions about the ultimate intentions and goals of government action (Creighton 2005). To accurately account for all values and preferences, citizens should have a stronger voice in environmental decision-making processes (NRC 1996).

Benefit 2: Improving the quality of decisions

Public involvement can contribute to the quality of decisions being made. It can clarify objectives and requirements of a project or policy and encourage rethinking of hidden assumptions that might prevent experts from seeing the most appropriate solution (Creighton 2005). Citizens can improve the quality of decisions by providing local or site-specific

knowledge, identifying mistakes in proposed solutions, or offering alternative solutions that satisfy a variety of interests (Beierle and Cayford 2002).

For example, Georgia EPD has presented a variety of proposals for minimizing water withdrawals for various water users. One section of proposals focuses on conservation practices for public and private water providers. It is impossible for EPD to know which of the proposed policies are feasible and cost-effective without the input from public and private water providers. At the Statewide Advisory Committee meeting on minimizing water withdrawals on March 23, 2006, several stakeholders within the public/private water provider sector pointed out that some of the proposed policies are outside of their control. For example, one of the proposals was for public and private providers to require rain or moisture sensor shut-off devices installed on all new landscape irrigation systems. The water providers said that this was not a regulation that they could enforce because it is outside of their regulatory authority. They noted that changing the Georgia Standard Plumbing Code would be necessary to achieve this step, and that EPD should work with the Department of Community Affairs and irrigation businesses to implement this policy. Planners may not know firsthand how these proposed policies will impact water providers. Including water providers at the planning table enables EPD to draw on their knowledge and experience to develop policies that minimize water withdrawals in the most feasible and cost-effective way for them.

Benefit 3: Resolving conflict among competing interests

Court battles and other conflicts consume substantial amounts of time, energy, and money, and many environmental problems continue to be unresolved. It is more difficult to resolve an issue once the situation becomes acrimonious and adversarial. Susskind and Cruickshank (1987) argue that collaborative, participatory decision making, as opposed to

adversarial decision making, is more likely to result in lasting and satisfying decisions. Public deliberation can identify shared values, leading to more cooperative rather than confrontational decision making (Susskind and Cruickshank 1987; Dryzek 1997). Public participation "may build a solid, long-term agreement and commitment between otherwise divergent parties" (Creighton 2005, 19). Even if participants cannot resolve a particular issue, the process should lead them to understand the goals and motivations of others by fostering communication and strengthening relationships (Beierle and Konisky 2000).

Benefit 4: Building trust in institutions

Over the last four decades, analysts have noted that public trust in the government has declined dramatically (Ruckelshaus 1996; PRC 1998). Amidst notorious scandals and abuses of power, the level of trust in the federal government is half what it was during the 1960s (Gallup Poll 2006). This drop in trust may represent healthy skepticism, which is important for ensuring government accountability. But as trust in those responsible for solving complex environmental problems continues to decline, their ability to resolve those problems is jeopardized (Ruckelshaus 1996; Beierle and Cayford 2002). Research suggests agencies may be able to rebuild trust through greater public control over decision making (Schneider et al. 1997).

Benefit 5: Educating and informing the public

Educating and informing the public about environmental issues builds capacity for solving problems. Education integrates information related to the problem with participants' knowledge, experience, and intuition to develop a mutual understanding and a combined awareness of solutions. This form of education helps the public build the capacity necessary to develop alternatives and helps level the playing field between the public and the experts (Beierle and Cayford 2002).

An effective public participation program can result in a better-educated public and civil society. Participants not only learn about the subject matter, but also how and why the government makes decisions. Public participation trains future leaders by teaching them how to work together effectively, influence others, and pull together to solve problems, for example, by building coalitions (Creighton 2005).

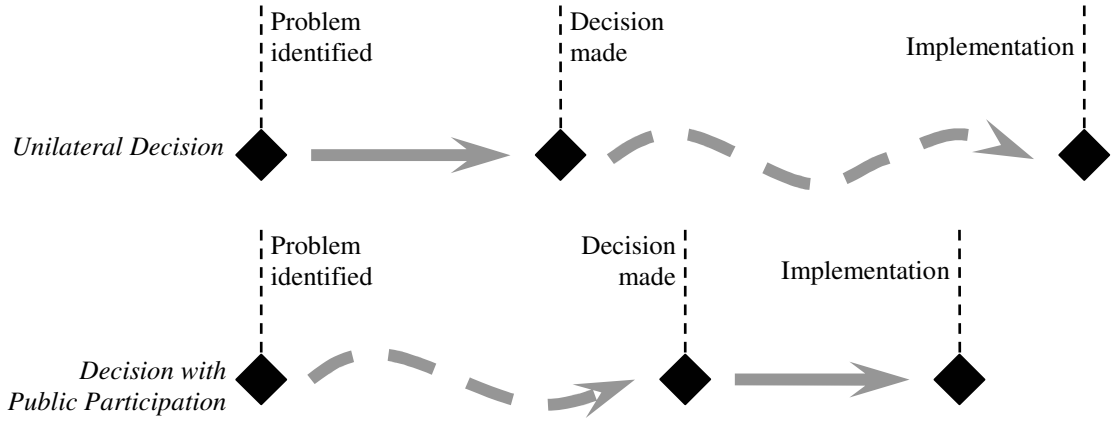
Benefit 6: Minimizing cost and delay

If public participation is integrated into the decision-making process, it may end up saving time and costs. Unilateral decisions can be made very quickly, but are often more expensive to implement (Figure 3:2). Sometimes they are met with so much resistance that implementation is impossible. They may be tied up in controversy, postponement, and costly court battles. The efficiency of decision making cannot be measured only by time and initial costs, but must take into consideration any delays or costs associated with how the decision was made. If a decision is made quickly but alienates interested parties, it could be very costly in the end (Creighton 2005). While involving the public from the beginning may take more time to reach a decision, the implementation process will often be met with much less resistance because of participant buy-in along the way.

Benefit 7: Increased ease of implementation

Participation provides people with a sense of ownership for their decision, and participants want to see that decision implemented once it has been made. The decision not only receives political support, but those involved may eagerly assist with the implementation efforts (Creighton 2005). Participatory processes can also lead to the support of others who may be in a better position to assist with specific components of implementation (Beierle and Konisky 2001).

Figure 3:2 – Comparison of Length of Time: Unilateral Decision versus Public Participation



Source: Creighton 2005.

Benefit 8: Maintaining credibility and legitimacy

Legitimacy and credibility are maintained by ensuring that the decision-making process is visible and involves the public. Maintaining legitimacy and credibility with the public is especially important when controversial decisions are being made. Public participation programs leave the public with an understanding about the rationale behind the decision (Creighton 2005).

Benefit 9: Anticipating public concerns and attitudes

By working with the public, agency staff will become aware and more sensitized to participants' concerns and their view of agency operations. A public participation program will document public viewpoints so that in the future the agency can better anticipate public response to procedures or decisions that do not require a formal public participation program. Public participation can also reveal to decision makers the relative importance the public assigns to values-based choices embedded in a particular decision (Creighton 2005).

Characteristics of an Effective Public Participation Program

Many factors influence whether a public participation program succeeds or fails. Creighton (2005) identifies five characteristics of an effective public participation program. These characteristics are perceived as effective by both the agency conducting the process and the public participating in the process.

First, public participation is a way for decisions makers to acquire the mandate needed to act. There are many issues in the environmental arena and other areas such as reproductive health, where society cannot reach consensus, making each decision highly contentious. Administrators or managers are unable to make implementable decisions using only the standard notice and hearing procedures under these conditions. Without more feedback from the public, administrators may propose a solution that is met with so much public resistance that it is impossible to implement (Creighton 2005).

Second, the public participation process should be well integrated into the overall decision-making process. Research suggests that public opinion varies widely depending on when public involvement occurs (Sinclair and Diduck 1995). Public involvement in environmental decision making too often occurs after the decision is made, making it more reactive in nature (Konisky and Beierle 2001). It is important to go to the public early and in an ongoing way. If not, the public may feel that their participation has no effect on the decision being made (Ruckelshaus 1996; Creighton 2005).

Third, it is important to involve the public in every step of the decision-making process. Important decisions do not occur at the same time in a decision-making process. Incremental decisions, such as how to define the problem and which alternatives should be considered, are made throughout the process. Involving participants throughout the process helps maintain

legitimacy and helps them understand the rationale behind decisions, which is critical to its success (Creighton 2005).

Fourth, public participation programs must be designed to ensure the involvement of all interested stakeholders who may be affected by the outcome. People participate when they believe they have a stake in the decision being made or when their interests or values may be affected. The public will participate more when they are informed about an issue and the possible impacts of a decision. They will also participate more when they know how, when, and where they can participate. To receive support for decisions being made, it is more important to have a full range of opinions represented by stakeholders than it is to have a large number of participants. In other words, the number of interests represented in the decision-making process is more important than the number of participants. If certain stakeholders are left out of the process, they will likely view the process as flawed, have no stake in the outcome, and may seek other ways to influence the decision, for example through legal action or elected officials (Creighton 2005).

Finally, for a program to be effective, multiple participation techniques should be used and aimed at different audiences. A public participation program should not consist of only one activity, but a succession of activities specifically related to the task being completed and the audience. Several activities may occur at the same time. For example, an effective participation process might include a technical advisory committee, a policy committee, a citizen advisory committee, and periodic newsletters to ensure that everyone who would like to be involved remains informed throughout the process (Creighton 2005).

Public participation is only effective if the public is engaged in the process. The public and decision makers should engage in learning from each other, respect others' viewpoints, and

genuinely evaluate proposed options. It is important to have a shared understanding of the public values and issues to be resolved. Effective public involvement goes beyond the decision-making process as the public should help with implementation and monitoring the outcome of the decisions. While the public does not need to become experts, they do need enough information to understand the proposed policies and the implications of policy options., so that they can express how it will affect them (Sarno and Keyes 2002).

Public Participation Techniques

With the growth of public participation in the decision-making process, practitioners, scholars, political leaders on all levels, and citizens are exploring ways to promote more meaningful public involvement in environmental decisions. An assortment of processes that emphasize face-to-face deliberation, collaborative problem solving, and consensus building are joining the traditional public hearings and public comment procedures (Beierle and Cayford 2002; McKinney and Harmon 2002). For example, agencies such as the U.S. Environmental Protection Agency, the U.S. Department of Energy, the U.S. Forest Service, and the Bureau of Land Management are hoping to improve public participation by experimenting with new involvement processes, such as community-based collaborations, community advisory boards, citizen review panels, and online discussion forums (Depoe and Delicath 2004). This increased interest in public participation is a result of its ability to improve the quality of decisions being made and to enhance the effectiveness and responsiveness of environmental management (Beierle and Konisky 2001). When executed well, these processes can provide a new approach for incorporating public values in decisions, addressing conflict, and building trust (Beierle and Konisky 2000).

Traditional public participation mechanisms, such as hearings or comment procedures, have several shortcomings, which have contributed to the need for more innovative techniques. First, policymakers, administrative officials, and experts often view public participation as a way to educate and persuade the public about the legitimacy of the decisions that have already been made as opposed to having the public contribute in making those decisions. Second, public participation often takes place too late in the decision-making process, sometimes after decisions are made. Third, traditional processes can be adversarial, especially when officials conduct processes in a 'decide-announce-defend' manner. Fourth, public participation often has insufficient mechanisms for informed dialogue among participants. Finally, public participation often lacks provisions to ensure that participants' input will have a real impact on the outcome of the decision (Depoe and Delicath 2004).

There are numerous involvement mechanisms that are now familiar components of public participation processes. For example, round tables and collaborative watershed management bring together various stakeholders to deliberate and either reach a decision or develop a set of recommendations. Round tables tend to be advisory, while collaborative watershed management can replace or share government authority (Konisky and Beierle 2000). These processes have surfaced as methods to address the numerous court battles, opposition to agency decisions, and the lack of trust in the government (Beierle and Konisky 2000). The premise of these processes is that "if the appropriate people – citizens and officials – come together in constructive forums with good information, they will create fair, effective, efficient public policy" (McKinney and Harmon 2002, 166).

Techniques for getting information to *the public*

Behind every successful public participation program is a solid public information program. Before participating, citizens need information so they can be more informed about the subject matter, resulting in more informed decisions being made. It is important to produce complete and unbiased information that explains how the decision could affect the public and their interests. If the public senses that the information is biased towards a particular outcome or omits relevant information, they may stop trusting that source and look to other sources. Once credibility is lost, it is very difficult to regain (Creighton 2005).

A variety of techniques are used to get information to the public. Many of these techniques involve the media, such as feature stories, editorials, interviews or talk show appearances, news conferences and media briefings, newspaper inserts, news releases, public service announcements, and paid advertisements. Publications, videos, and brochures are commonly produced and often distributed to the public through mass mailings. The Internet is also a valuable tool for disseminating information because the information can reach many people quickly and can be updated easily. The Internet is useful for creating websites, cataloging technical reports or environmental documents in information repositories, and developing programs for computer-based participation opportunities (Sinclair and Diduck 1995; U.S. EPA 1997; Creighton 2005).

Interaction within a local community is another way to educate the public. Examples of these methods include presentations to community groups, panels, symposia, community events, field trips, citizen training programs, exhibits and displays, open houses, and phone calls. Other tools to educate a community depend upon visibility, such as license plates, highway signs and

billboards, bumper stickers, and storm drain stenciling (Sinclair and Diduck 1995; U.S. EPA 1997; Creighton 2005).

An informed public is more likely to become involved in the decision-making process. Some of the participatory responses from the public include attending public meetings, signing or circulating a petition, contacting an elected official, joining a local environmental group, or attending a march or rally (Laurian 2004).

Techniques for getting information from *the public*

The essence of public participation, unlike public information, is the emphasis on two-way communication and interaction between the decision-making entity and the interested public. There are a range of techniques used to elicit information from the public. Recalling Arnstein's (1969) ladder of citizen participation, there are considerable differences in the levels of interaction depending on the technique used. For example, public hearings provide little, if any, two-way communication, whereas other techniques, such as negotiations, provide citizens with decision-making authority. Some techniques serve a general purpose, while others are more specialized. Because each situation is different, no single technique can fit all circumstances. The goal is to match the appropriate technique to the level of interaction necessary at certain stages in the decision-making process (Creighton 2005).

There are a variety of techniques used to obtain information from the public. After public meetings and hearings, the most common technique is a citizens' advisory group or task force. Several techniques can be used to facilitate small group discussions, such as focus groups, retreats, workshops, or coffee klatches. Future Searches and charrettes are multi-day techniques that bring together a large number of participants to agree on necessary changes or a common vision. Consensus building programs are used to reach agreements. These may include

facilitation, mediation, arbitration, and specialized techniques like mini-trials or disputes review panels. Interviews are helpful when collecting qualitative information, while polls and surveys can be used to collect quantitative data. Some techniques allow for interaction within the community, for example field trips, open houses, or City Walks (Creighton 2005).

The computer offers many ways to obtain information from the public. The Internet can be used for chatrooms, Web conferencing, and other virtual forms of communication. Various computer models are being produced to support computer-aided negotiations. Groupware is a term to describe "a large number of electronic technologies designed to support collaboration" (Creighton 2005, 117). The most common forms of groupware are keypad electronic meeting systems and computer-linked white boards (Creighton 2005).

When working with small or large groups of participants, regardless of the meeting format, a good leader is necessary to direct the process. Because decisions can be contentious, it is a helpful to have a meeting leader unaffiliated with the decision-making agency. That way the leader is perceived as neutral rather than carrying out the interest of the agency. It is wise to hire an external facilitator (Ruckelshaus 1996; Creighton 2005). A facilitator is a trained professional who helps design effective meetings and then guides, not directs, the meeting. While facilitators do not have authority to make decisions for the groups, they are useful for proposing, suggesting, inviting, and then consulting with the participants. The facilitator's responsibilities are as follows: (a) keep the meeting on track and focused, (b) ensure that everyone's view is heard, (c) acknowledge feelings, (d) state the problem constructively, (e) recommend a problem-solving approach, (f) summarize and clarify direction, and (g) test for consensus. The role of a facilitator is to create an atmosphere of mutual respect and psychological safety, making it possible for

participants to consider a variety of solutions instead of predetermined positions (Creighton 2005).

Factors Influencing Participation

People get involved in decision-making processes for several different reasons. According to Laurian (2004), four factors affect participation – sociodemographic characteristics, individual motivations, local social context, and trust in government agencies.

Sociodemographic characteristics influence whether or not a person participates in decision making. The time, effort, and money required make participation costly; therefore, individuals with more resources are more likely to participate (Lyons and Lowery 1986). Other factors include race, gender, age, education, and employment status (Laurian 2004).

The second factor influencing participation is individual motivations, which vary from person to person. According to public choice theory, "individuals participate in local decision-making processes when outcomes are relevant to them and when the potential benefits of participation outweigh the costs" (Laurian 2004, 56). When people are informed about an issue and the possible impacts of a decision, they are more likely to participate (Creighton 2005). Some people sense that they can influence policy by taking a clear, public position on an issue affecting them. Others may participate because they have an intense interest in the subject. For example, those who care about the environment may feel a responsibility to address current problems for the benefit of future generations. Some people get involved because they like to participate in politics and enjoy it, like others enjoy hobbies and sports. Others get involved because of community attachment or feelings of belonging to a place. Some people are motivated when something happens in their local community that mobilizes them to care deeply about the issue, for example, the proposal of a landfill near their home (Birkland 2001).

The third factor affecting participation is the local social context of the individual. Social networks and community groups function as pathways of recruitment for public participation. According to Verba, Schlozman, and Brady (1995), participation derives from rich interpersonal networks, and most active individuals are involved because someone they know recruited them. Those who are involved in social networks are more likely to participate because there are more opportunities available to them than to those outside of networks. Community groups offer a structure conducive to participation, because they can reduce costs associated with participation and increase the likelihood that action will be successful. It is easier to join a group than to participate individually, and individuals have a better chance of being heard when they organize in interest groups or coalitions and put pressure on decision makers (Laurian 2004).

Finally, trust in government agencies influences participation. Trust is an important factor in the relationship between government agencies and the public. The public's negative perceptions of government may influence participation. Gamson (1968, 48) states that the ideal condition for mobilization is a combination of high political efficacy and low political trust – "a belief that influence is both possible and necessary." Grassroots activism and residential neighborhood associations are viewed as alternative power structures, ideologically based upon distrust in government (Greenberg and Lewis 2000). In the case of many environmental issues, including water management, if government agencies are not trusted, the lack of citizen participation will result in less desirable outcomes and, comparatively, the potential benefits of participation will be higher. In contrast, some argue that trust in the government is necessary and promotes higher levels of participation (Docherty, Goodlad, and Paddison 2001) because participation is more effective when people believe that their actions matter (Lyons and Lowery 1986).

Several factors discourage public participation. Some people believe that the government is detached, unsympathetic, difficult to understand, and unable to be influenced by individual action (Birkland 2001); therefore, they choose not to participate. Ordinary citizens have limited knowledge about specific issues and limited access to information, such as technical data or scientific reports, making participation difficult. Also, agencies discourage participation when notices of proposed projects and their locations are explained in technical or legal terms (McKinney and Harmon 2002).

Education – A Necessary Component of Public Participation

If citizens, particularly those with no formal training or specialized knowledge, are to actively participate in environmental management, education and information is of utmost importance (Beierle and Konisky 2001). To encourage participation, the public must be provided with additional and relevant information about the problem and the possible impacts of a decision, resulting in more informed decisions being made. They also need to know how the public participation process and the overall decision-making process will be conducted (McKinney and Harmon 2002; Creighton 2005). Because the public tends to have limited knowledge about the subject matter and limited access to information, it is critical that agency staff, nonpartisan organizations, and community groups find ways to educate concerned citizens. For example, providing periodic newsletters without technical or legal jargon to all stakeholders serving on advisory committees as well as concerned citizens will ensure that everyone who would like to be involved remains informed throughout the process. It is important to produce complete and unbiased information that explains how the decision could affect the public and their interests. The goal of producing materials for educating the public is to ensure that those

who have not determined their positions can perceive the information they receive as useful and reliable (Creighton 2005)

In the context of public participation, the term education is not used in its strict pedagogical sense, but in a more informal approach emphasizing information dissemination, various communication practices, and pedagogical methodology. Sinclair and Diduck (1995, 228) argue that "education is a necessity – a precondition to advance levels of public involvement." Mullins and Neuhauser (1991) state that public education and public participation support social cohesion and economic welfare within a community. They believe that more enlightened decisions regarding the maintenance and use of the environment will be made if the participating community is more knowledgeable about the subject matter (Mullins and Neuhauser 1991). Nearly all public participation methods include a wide range of education techniques (Sinclair and Diduck 1995).

Education is an undervalued component of public participation. Laurian (2004, 56) states that "no study has looked at the effects of residents' information levels on participation, but logically, as residents are more informed about local issues, they should be more likely to participate." Evaluations of public involvement processes tend to focus on the decision-making power given to the public, not on the nature and quality of public education. Literature often emphasizes that effective, efficient, and fair public participation processes require a greater degree of citizen power in decision making – rungs six through eight of Arnstein's ladder (1969). However, to achieve higher degrees of citizen power, citizens must be knowledgeable about the subject matter and the decision-making process – a factor that is often overlooked or ignored (Sinclair and Diduck 1995). "An effective transfer of power requires an effective transfer of

knowledge" (Sinclair and Diduck 1995, 228). In other words, it is important to level the playing field.

The Benefits of Public Participation in the Context of Statewide Water Planning in Georgia

Many of the benefits of public participation are directly applicable to statewide water planning in Georgia. Resolving water issues involves making values-based decisions, a type of decision that cannot be effectively made by a central planner. Solutions to values-based issues require public input and buy-in, and public participation is a way for public values and preferences to be identified and incorporated into water management decisions. Public involvement can improve the quality of decisions and increase the ease of implementation, both of which are critical to the development of a sustainable water management plan in Georgia.

The statewide water planning process involves contentious issues, and public participation provides a way for competing interests to all have a seat at the table. Citizens and stakeholders want to participate when their values and interests might be affected. Many people have a connection to water, so it is important that they have input on decisions that may affect their business, farms, homes, and lives. During the planning process, EPD will bring a variety of proposed solutions to the table for consideration, and public participation is a way to ensure that all viewpoints will be considered in deciding which solution to adopt. Without public participation, it would be impossible for EPD to know how the various proposed policies would affect different citizens or interest groups.

It is impossible for a central planner, such as EPD, to know what actions are "best" from the citizen's perspective without first receiving input from citizens. Through the public involvement process, EPD will take input from hundreds of citizens and stakeholders in an effort to determine which actions are "best" from the citizen's perspective. The process will attempt to

determine which sets of management actions are favorable to most stakeholders, and EPD will choose these actions over options that are more controversial.

The purpose of my project is to facilitate citizen and stakeholder participation, so that the process will be successful in identifying appropriate solutions. The benefits of public participation cannot be realized without effective citizen participation, and effective citizen participation can only occur if citizens are educated about the process and the proposed policies. Therefore, public education materials are an essential part of a successful public participation process.

Public Participation and EPD's Statewide Water Planning Process

EPD has designed a public involvement process that includes three types of advisory committees. These advisory committees will provide EPD with feedback and comments on proposed policies. However, EPD and the Water Council retain all decision-making authority.

Because the public can merely advise, and does not share in the decision-making authority, EPD's public involvement process fits on Arnstein's (1969) ladder at rung five: placation. Although public participation literature suggests that a greater degree of citizen power in decision making is necessary to realize the full benefits of public participation, rung five does involve more than mere information sharing, and is only one rung away from providing the public with some actual authority.

This public involvement goes beyond the usual public comment and hearing procedures that EPD and other agencies regularly provide. EPD has designed one of the largest stakeholder processes that a state agency has ever used in Georgia, which is a step in the right direction towards public involvement. EPD has already included many characteristics of an effective program, although some elements could be improved.

Dissemination of Information

Because EPD has designed a process that includes many stakeholders that represent a variety of interests, the need for informational materials is paramount. EPD created a water planning website that posts the meeting schedule and location. Information to be discussed at the meetings is posted on the website and emailed to participants. In addition, EPD posts meeting summaries after each meeting has taken place.

However, there are shortcomings to the way in which EPD has provided information. One of the main problems with the information is that it is presented in large technical documents. In order to learn what will be discussed at each meeting, participants must wade through numerous pages of material posted online in PDF format. There is no way to browse the information online without searching through the entire document. Also, the information packets are often emailed to participants very close to the actual meeting time, giving participants little time to prepare.

One way for EPD to improve the information dissemination process would be to provide a newsletter that regularly updates all advisory committee members and the Water Council about what is currently taking place so that everyone stays up-to-date with what is happening.

Integration into overall decision making process

Public participation process must be well integrated into the overall decision-making process, and the public should be included from the beginning and in every step of the process. EPD began developing its proposed policies with the help of Technical Advisory Committees. Then these policies were reviewed by Basin Advisory Committees, and later discussed with the Statewide Advisory Committee. Although these committees do not have any decision-making authority, they have been included from the beginning.

Inclusion of all affected stakeholders

An effective public participation process must include all affected stakeholders. EPD has done a good job selected the stakeholder groups to be involved in this process. To my knowledge, there have not been complaints from people about certain groups being included or other groups being left out.

Use of multiple participation techniques

Effective public participation programs include multiple participation techniques, and not only one activity. EPD has established Technical Advisory Committees, Basin Advisory Committees, and a Statewide Advisory Committee. There will be a series of town hall meetings to include the broader public. In addition, EPD has hired professional facilitators to lead all meetings.

CHAPTER 4

DESIGNING AN EDUCATIONAL PROGRAM BASED ON PROGRAM PLANNING THEORY OF ADULT EDUCAITON

The purpose of this project is to develop an online guide that will educate citizens about the statewide water planning process and empower them to become involved. The guide will include an overview of the water planning process, a description of water issues to be addressed, and an action plan for involvement. The intended audience is those who are serving on advisory committees as well as concerned citizens who are not officially involved in the planning process but would like to have a voice in how their water resources are managed. The goal is to help citizens participate more effectively in the statewide water planning process, ultimately leading to the development and implementation of a water plan that reflects the interests of a broad group of Georgians.

The Georgia Environmental Protection Division (EPD), the agency charged with developing the water plan, has designed a planning process that will unfold over the next two years. It will include over 250 participants serving on various advisory committees and will provide additional opportunities for public participation at town hall meetings. Because the planning process will involve many parties and address complex water issues that will significantly impact all Georgians, there is a need for educational materials to increase awareness and educate citizens about the water planning process. An educated and involved public is critical to assuring that the water plan reflects the interests of all Georgians who want to participate.

Program Planning Models for Adult Education

Traditional education program planning for adult learners consists of five steps: (1) assess needs; (2) define objectives based on needs; (3) identify learning experiences to meet objectives; (4) organize and implement learning experiences; and (5) evaluate the program in terms of objectives (Apps 1979). Typically, these models assume that planners are problem solvers who apply a set of technical procedures and methods regardless of social context. Classical program planning models have similar characteristics. They tend to be diagnostic, idealized, linear, neutral, one-size-fits-all, step-by step processes. In practice, they do not take into consideration many factors that influence program planning, such as power, stakeholder interests, negotiation, and political structure (Cervero and Wilson 1994).

Cervero and Wilson (1994) developed a more progressive program planning model that goes beyond previous classical models. They theorize that planning is a social activity in which people construct educational programs by negotiating personal, organizational, and social interests in contexts marked by socially structured relations of power. They recognize that people with power and interests plan programs. Negotiating interests constitutes the political process by which power is exercised in program planning. Program planning is not merely a process to meet the needs of adult learners. Instead, adult educators represent a variety of interests in addition to those of the potential learner in their planning, and these various interests form the basis of the program that is being produced (Cervero and Wilson 1994).

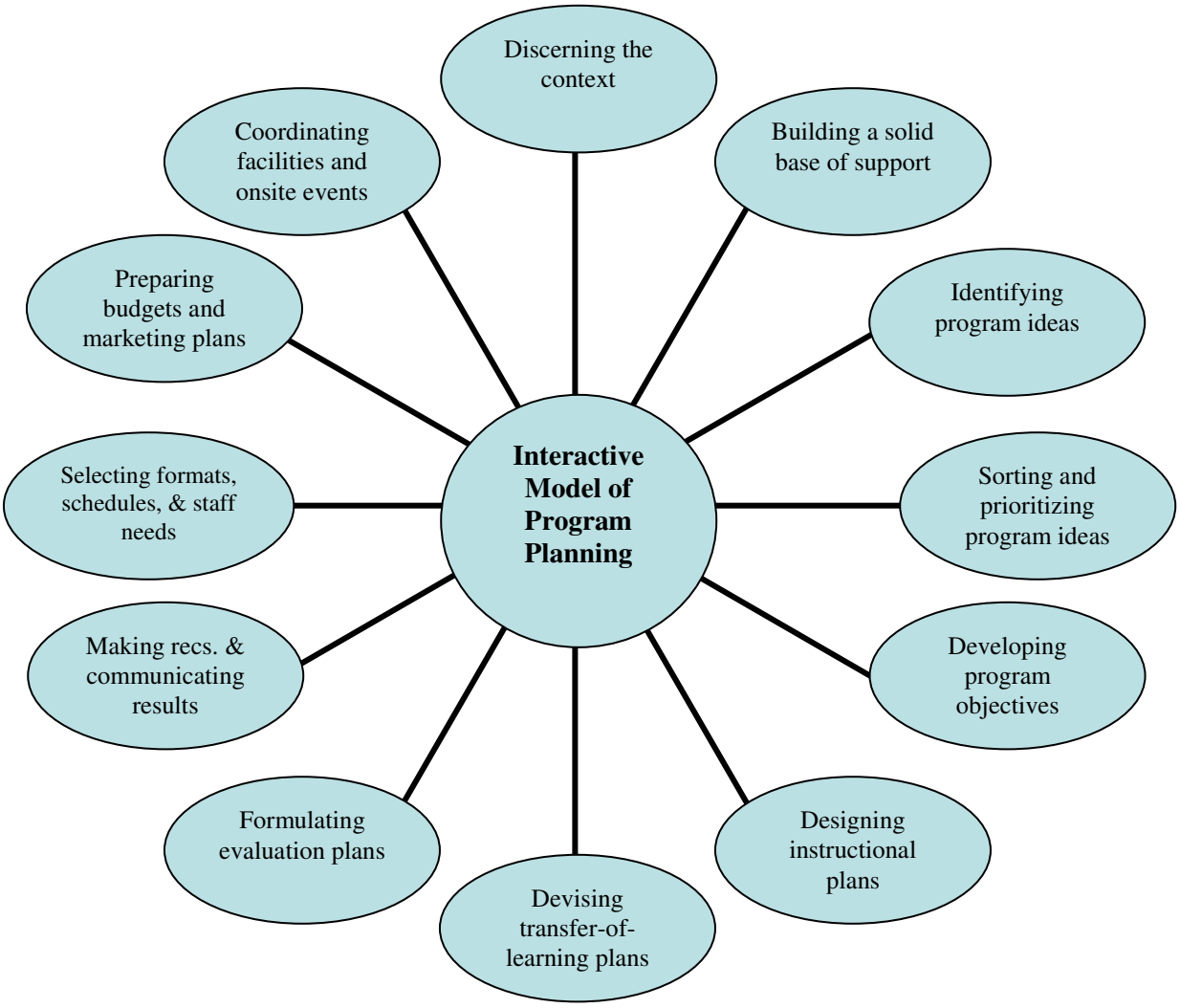
Cervero and Wilson's (1994) theory has four core concepts – power, interests, negotiation, and responsibility. First, power, or the socially structured capacity to act, exists in all human relationships and defines what people can do in a planning situation. People with interests and relationships of power design all educational programs. Second, interests direct the

planning process (Cervero and Wilson 1994). They are complex sets of "predispositions embracing goals, values, desires, expectations, and other orientations and inclinations that lead a person to act in one direction or another" (Morgan 1986, 41). "Power and interests define the social context in which planners must act" (Cervero and Wilson 1994, 29). Third, negotiation is the central activity in constructing a program. According to *Webster's Third* (1966), to negotiate is "to communicate or confer with another so as to arrive at the settlement of some matter." Planners negotiate with power and interests to construct a program. Fourth, responsibility in planning practice is having an active and ethical awareness of the multiple interests involved. In planning responsibly, planners negotiate power and interests and anticipate how existing power and interests will affect or influence a planning process that is both democratic and participatory (Cervero and Wilson 1994).

Cervero and Wilson's (1994) program planning theory is a major source for Caffarella's (2002) program planning model, which builds on previous models of program planning. Caffarella developed the Interactive Model of Program Planning, which "acknowledges that people plan programs and that planning is not a neutral set of events. Rather, program planners often find themselves swimming their way through organizational, ethical, political, and social waves" (2002). The Interactive Model consists of 12 components, which are illustrated in Figure 4:1.

While its components appear to be similar to other models, it differs in four ways. First, it is interactive and comprehensive by design, meaning it is non-sequential and ever changing. It has no real beginnings or endings because planning is rarely, if ever, a linear process. Instead, planners are encouraged to use relevant parts in any order or combination depending on the planning situation. Flexibility is the key to this particular planning model. It should be tailored

Figure 4:1 – Caffarella's Interactive Model of Program Planning



Source: adapted from Caffarella 2002, Figure 2:1.

to meet the needs and demands of a specific program. Second, people and places are recognized as critical to the planning process. Third, cultural differences are taken in to consideration. Finally, practitioners find the model a useful and practical tool (Caffarella 2002).

The primary reason for using this particular theory and model of program planning is that they take into consideration power, interests, and negotiation, which are central to planning a program related to a political process. Designing a citizen's guide that follows a politically

driven and politically structured process must consider these important factors. Planning a program that fails to acknowledge them would be a waste of time for everyone involved. These models ensure that those who are not at the planning table have a voice by taking into consideration the needs of all stakeholders. This is important in the Georgia water planning process because it is critical that all stakeholders have what they need to participate effectively, so their input into this guide is valuable.

In the following sections, I will provide an overview of selected components from Caffarella's Interactive Model (2002), and then discuss how my project addresses each component.

Social and Organizational Context of Program Planning

When planning a program, it is important to understand the interests, relationships, and power of all parties involved. People plan programs, and people have their own sets of beliefs and interests that they bring with them. Knowledge of the people, the organizations involved, the wider environmental factors, and the power dynamics is important when planning a program. Planners must consider structural, political, and cultural factors that may affect the program. It is important to have credible contextual knowledge when completing components of the planning process (Caffarella 2002).

Discerning the context

Chapter Two describes the statewide water planning process designed by Georgia EPD. Figure 2:2 illustrates the public involvement process. This public involvement process is one of the largest undertaken by any state agency in Georgia. It goes beyond the usual public hearing and comment procedures. EPD has made a significant effort to include all stakeholder groups.

One must assume that not every stakeholder is knowledgeable about all aspects of water issues; therefore, the need for educational materials is paramount.

A major political element that must be considered in the water planning process is that all decision-making authority rests in the hands of bureaucrats and politicians. The Water Council will be making the decisions about the contents of the water plan, and the Water Council consists of eight agency heads, four non-voting legislators, and two at-large members appointed by the Speaker of the House and the Senate President Pro Tempore. The General Assembly approves or rejects the proposed plan from the Water Council. While "meaningful participation" is a guiding principle, those participating are solely there to provide their input and have no decision-making authority. This is discouraging to some participants. Several concerned citizens within the conservation community have the impression that the content of the final water plan has already been decided and that the public involvement process, which involves over 250 unpaid individuals, is "only for show." They are concerned that their involvement is solely to gain support for decisions already made. Past public involvement experiences may support this concern.

To the extent that the planning process is fair and open, the guide will help citizens play a more effective role in the process. To the extent that the process is not fair and open and is simply a public relations effort for decisions that have already been made, then the guide will help citizens understand what should be happening in the process, so that they can push back against the anti-democratic elements of the process. If the latter occurs, I can add information on the guide that will help citizens understand what is happening and help them overcome these problems by voicing their concerns to the appropriate parties.

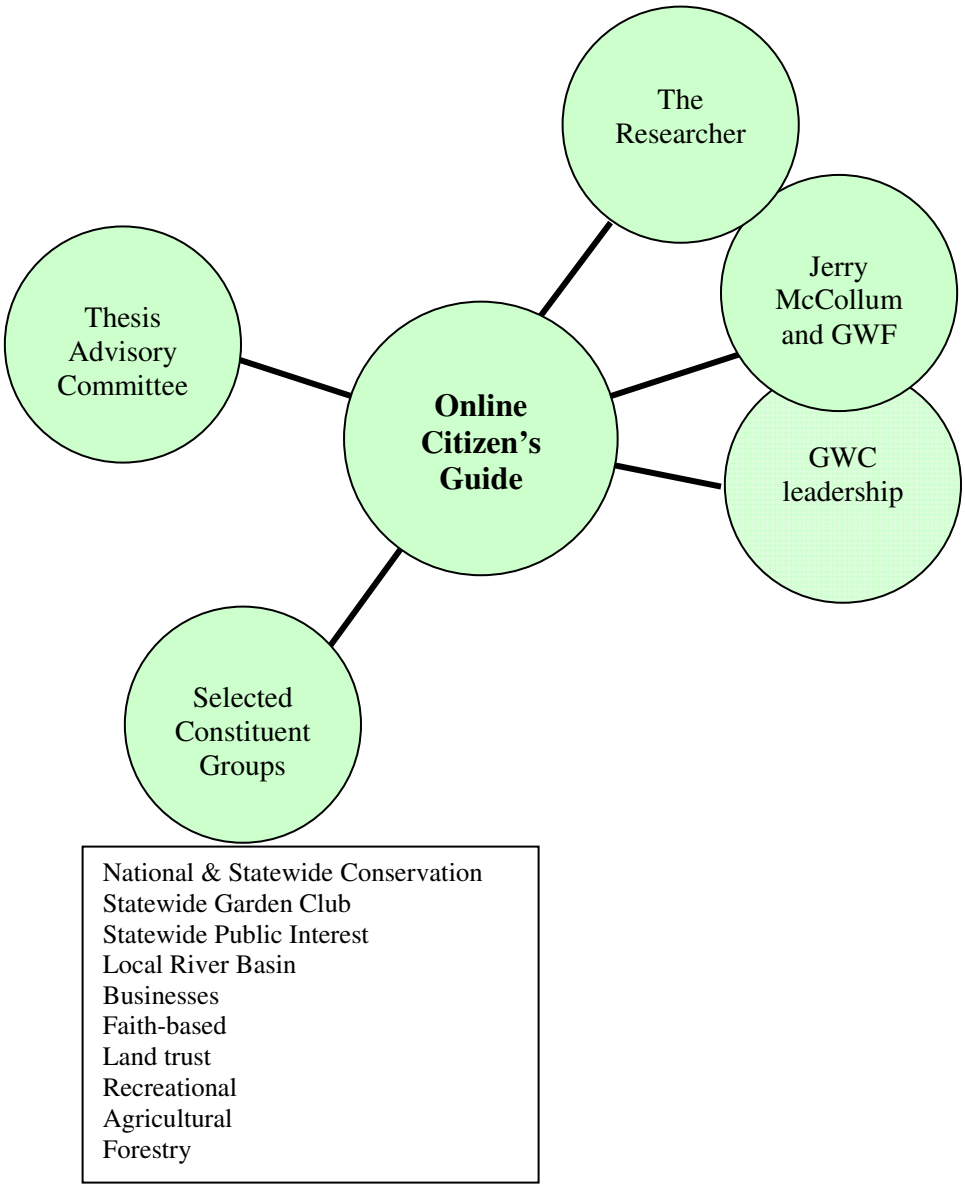
Building a solid base of support

Planners have an ethical responsibility to ensure that all interested parties are given a democratic voice at the planning table. An ongoing and integral component of program planning is building a solid base of support. By ensuring support from key constituent groups, support from the wider community is assured (Caffarella 2002). Throughout the development of the citizen's guide, several groups of stakeholders were involved. Figure 4:2 is a stakeholder map that illustrates the relationships of stakeholders involved with this project. While I often use the term "stakeholder" to refer to everyone participating in the development of the water plan, in this context, a stakeholder is a person or group associated with this thesis. All stakeholders, besides my thesis committee members, are also stakeholders in the state's water planning process. These thesis stakeholders are discussed in detail below.

1. Thesis advisory committee

My thesis advisory committee consists of three committee members. Laurie Fowler, my major professor at the Institute of Ecology, is knowledgeable about environmental planning and management in Georgia and has served on several statewide water committees, including the Joint Comprehensive Water Plan Advisory Committee, the Water Rights Subcommittee, and the Attorney General's Water Advisory Council. Kathryn Hatcher, also a professor at the Institute of Ecology, is on my committee because of her expertise in water policy and experience with stakeholder groups. Richard Kiely, a professor in the Department of Adult Education, is serving on my committee because of his knowledge and experience with planning educational programs for adults and work with stakeholder groups. These professors provide helpful and much needed advice and guidance throughout the development of this thesis and citizen's guide. They are responsible for final approval of my thesis.

Figure 4:2 – Thesis Stakeholder Map



2. Selected constituent groups

To build a solid base of support, I selected fifteen diverse constituent groups to assist with the development of the citizen's guide by providing input about what they would find useful through a survey. The selected groups include national and statewide conservation organizations, the statewide garden club, a statewide public interest group, local river basin groups, businesses, a faith-based organization, a land trust, a recreational organization, an agricultural organization, and forestry organizations.

I selected these groups to receive the survey for several reasons. First, they represent a wide variety of citizens and interests who will likely be affected by certain components of the statewide water plan, and most are participating in the development of the plan. Second, many of these groups have citizen memberships. Involving them in the development of the guide will help publicize the guide to their memberships, which may result in more participation in the development of the water plan. Third, they were selected because they have knowledge about the water planning process and realize its potential impacts on their lives and the lives of their constituents. Finally, through their personal knowledge and expertise, they can provide input about what they would find useful in the guide. I mailed these groups a survey at the beginning of the project to obtain their support and receive their input for the citizen's guide. Once the guide is complete, many of them will use the guide as they participate and provide a link to the guide on their organization's website.

3. Jerry McCollum and the Georgia Wildlife Federation

Jerry McCollum is the President and CEO of the Georgia Wildlife Federation (GWF), the state's oldest and largest conservation organization with nearly 50,000 members. Members of GWF include hunters, anglers, birders, gardeners, educators, and outdoor enthusiasts. By

recognizing the need and value of this project, GWF continues to provide financial support. Jerry has offered his advice and support by helping me decide on this particular topic, drawing from his knowledge and experience from working nearly 40 years in the conservation community in Georgia. Once this project is complete, I will continue working at GWF, and one of my responsibilities will be to maintain the online guide.

GWF is directly involved in the development of the statewide water plan. GWF is a founding member of the Georgia Water Coalition, which is actively involved in the statewide water planning process and a variety of other water-related matters. The Executive Vice President serves on the Statewide Advisory Committee, and two staff members and one board member serve on Basin Advisory Committees. The GWF is hosting a Statewide Advisory Committee at its Alcovy Conservation Center on May 2, 2006.

4. Georgia Water Coalition leadership

The Georgia Water Coalition (GWC) is a group of 132 organizations, businesses, and associations united by a common goal: "to protect and care for Georgia's waters – an essential ingredient to strong property values, clean water for drinking, recreation, fish and wildlife, and Georgia's continued prosperity." The four founding leaders of the GWC – the Georgia Wildlife Federation, the Georgia Conservancy, the Upper Chattahoochee Riverkeeper, and the Southern Environmental Law Center – have expressed a need for the citizen's guide, and their support will link my guide to the 132 member organizations of the GWC. The GWC's ongoing mission is to create even broader awareness during the development of the Comprehensive Statewide Water Management Plan.

The GWC has gained much political clout since its inception in 2002 and has been very influential in the decision-making process. At the 2003 General Assembly session, the GWC

was instrumental in the defeat of an attempt to introduce a market-based system for selling water permits, as discussed in Chapter Two. At the 2006 General Assembly session, the GWC worked virtually alone to build a bi-partisan movement to defeat legislation that, in its weakest form, would have allowed construction inside of the 150-foot stream buffers required upstream of drinking water reservoirs.

The GWC has 25 representatives serving as stakeholders on the Statewide Advisory Committee and the Basin Advisory Committees. The GWC has at least one stakeholder on each Basin Advisory Committee, and as many as six stakeholders serving on one Basin Advisory Committee. The GWC has also drafted position papers for Georgia EPD and the Water Council that present their positions and recommendations on each of the four management objectives that the water plan will address. During the summer of 2006, the GWC will organize local meetings ahead of EPD's town hall meetings to educate citizens about the proposed policies on the water plan.

5. The researcher

My experience working at GWF as the water issues coordinator is a major factor in choosing this research topic. As water issues coordinator, my responsibilities include building, organizing, and managing the Georgia Water Coalition. I am directly involved in the water planning process through my job. I represented GWF at the first Statewide Advisory Committee meeting on March 23, 2006, and have drafted position papers with the GWC. I will be organizing meetings this summer to help GWC partners have a unified voice in the development of the water plan.

Through my experience at GWF, I learned a great deal about Georgia's need for a water management plan, specifically a plan that reflects the vision and effective participation of all

Georgians. I have gained knowledge through discussions with colleagues about past stakeholder experiences and heard concerns about how many opinions and concerns were frequently ignored. An example of this is the Savannah Harbor Dredging Project discussed later in this chapter. By creating a web-based educational tool, I believe that I will educate non-experts and empower them to become involved in the planning process. Without the voice of citizens, the water plan will be a product that will only benefit a select few and may negatively affect many who depend on our waterways for various reasons. After this thesis is complete, I will be in a position to continue working on this guide, as it will be an ongoing and much needed addition to the water planning process.

Negotiating Needs for the Program

All stakeholders have needs in relation to the program, and these needs must be taken into consideration when planning a program. Cervero and Wilson (1994) define needs as outcomes that stakeholders expect. Assessing the needs of stakeholders is a critical step when planning and evaluating a program. Identifying ideas and needs for educational programs can range from casual conversations to highly structured needs assessments. Without understanding stakeholders' needs, it is impossible to determine whether those needs have been met (Caffarella 2002).

The following techniques were used to generate ideas for this program: observations, conversations, and review of available resources. Once I determined the need for this program, I mailed a survey to select constituent groups as a follow-up needs assessment to help determine the content of the citizen's guide and receive input from constituent groups likely to be affected by components of the water plan.

Identifying program ideas

I determined the need for designing an online citizen's guide to statewide water planning in Georgia from my experience and knowledge as well as observations and conversations with others. The concepts that will be discussed and decisions that will be made during the water planning process are complicated and difficult for non-experts to understand. Most of the stakeholders serving on the advisory committees have not devoted extensive amounts of time to understanding and finding solutions to these complex issues. Most participants have other jobs that are not directly related to water management, and they are not being paid for their time. Most participants do not have the time to devote to researching the intricacies of these concepts so that they can effectively participate. However, it is imperative that these citizens understand these intricacies and have a voice in the development of this water plan so that it reflects the ideals and visions of the broader public. Creating an online citizen's guide that is easy to understand and easily accessible is critical to achieving this goal.

To help identify content, format, and layout ideas, I surveyed 20 different citizen's guides to help determine what would be advantageous to include in my guide. This process is discussed in Chapter Five. After contemplating the most beneficial format of this guide, I decided that developing a web-based guide is most practical and useful. The growing use of Web resources and recent advances in communication technology are transforming how we communicate, disseminate information, and conduct social transactions (Wang 2002). There are large numbers of Internet users in communities, including among community sectors with limited resources. Recent studies show that in 2004, nearly 70% of North Americans had access to the Internet at home or at work (Creighton 2005). By using the Internet, people can access information when it

is convenient for them and in the privacy of their homes. Also, a large amount of information can be posted in a timely manner and reach a broader public.

Negotiating needs

1. Observations and conversations

When I first learned that EPD was designing a public participation process that would include a large number of participants, the need for educational materials is one of the first ideas that occurred to me. To participate effectively, these participants need access to educational materials because many lack the knowledge and information needed to make the decisions that must be made during the water planning process.

When developing the topic for my thesis, I discussed ideas with several colleagues. Jerry McCollum has nearly 40 years experience working in the conservation community in Georgia Recognizing the need for this guide, he has provided me with much guidance and financial support through Georgia Wildlife Federation. I talked to Gail Cowie, who wrote her dissertation on stakeholder involvement in water management and is currently employed by EPD to design and implement the public involvement portion of the water planning process. I also talked to several others who gave me advice. These people include April Ingle, Executive Director of Georgia River Network; Glenn Dowling, Executive Vice President of Georgia Wildlife Federation and former Legislative Director of Natural Resources for the Association County Commissioners of Georgia; and Beth Gavrilles, Athens Grow Green Coalition board member and University of Georgia River Basin Center staff member. Through general discussion with people within the conservation community, I have learned that some have the impression that bureaucratic decisions have been made and that the extensive public involvement process is little more than a public relations effort to convince participants to accept decisions already made. If

this is the case, then there is a greater need for effective stakeholder involvement so that bureaucrats do not silence the public voice.

An example of a public participation process in Georgia that left many stakeholders frustrated is the Savannah harbor-deepening project of 1999. The Georgia Ports Authority (GPA) announced plans to deepen the naturally shallow Savannah River, which was previously deepened in 1994. After much community opposition, the GPA attempted to address concerns by organizing the consensus-based Stakeholder Evaluation Group (SEG), which included members from government, business, and the public. The process was designed around a participation model that emphasized "collaboration, cooperation, and participation" (Toker 2004, 197). By the second meeting of the SEG, participants began to notice inconsistencies with the GPA regarding consensus-based participation. The GPA attempted to control the agenda, deliberation, and decision-making authority, disregard consensus decisions, and distinguish between stakeholders who were initially described as equal. These inconsistencies "only fueled stakeholder frustration and decreased group productivity" (Toker 2004, 197).

Georgia EPD has designed a process that is more transparent than the Savannah harbor-deepening project. For example, Dr. Carol Couch, Director of EPD, requests input on the agenda at the beginning of every Water Council meeting. Because the stakeholder process is involves so many people it would be impossible for EPD to disregard consensus-based decisions in this process. However, the planning process is in its early stages, and no decisions have been made yet, so it is impossible to say whether EPD is controlling the decision-making process. Creating an online citizen's guide will help ensure participation in spite of the possible flaws that may arise from EPD's planning process.

2. Information sources

Much of the information addressing specific water issues that are relevant to the water planning process can be found on various academic, advocacy, or government websites. The University of Georgia's River Basin Center website has a variety of publications, but they are not organized by issue or theme, making it harder to find information. The University of Georgia's Carl Vinson Institute of Government website contains a variety of water issues papers. They are listed by a brief title, which means that the reader must open each PDF file and read through several pages to determine what it addresses and whether it is neutral or is arguing one side of the issue. Often these are position papers on debated issues rather than materials designed to inform the public about an issue in a neutral and informative way. Sometimes they debate each other back and forth (see "Georgia Water – A Public Resource or a Commodity: What are the *Real* Policy Questions" and "Straight Talk about Water Markets"). Nearly all of these papers are either written by technical experts and are intended for other technical experts, or by lawyers intended for other lawyers.

Georgia EPD is providing information packets to members of the advisory committees and has designed a website specifically pertaining to the statewide water management plan. Agency staff post relevant information and materials before and after meetings. However, the website is not always updated in a timely manner. For example, as of April 28, 2006, the last Water Council meeting minutes posted were from the June 7, 2005 meeting, even though there were four additional meetings after the June 7 meeting. EPD sends educational materials to participants prior to their advisory committee meetings. Often these materials are emailed only shortly before the actual meeting, not providing participants with enough time to digest the material. The information packets are written by technical experts within the agency and can be

difficult even for people who are familiar with these issues to understand. Another important factor that must be considered with information coming from EPD is that they are charged with developing the water plan; therefore, it is difficult to tell whether they are advocating positions. As Creighton (2005) points out, if the public senses that the information is biased towards a particular outcome or omits relevant information, they may stop trusting that source and look to other sources.

To address these shortcomings, the online citizen's guide will be updated in a timely manner so that citizens will have access to information they need to effectively participate. It is an unbiased source of information and is written without the legal and technical jargon used throughout EPD's materials, as that may discourage participation. I have specifically avoided advocated any positions, and only present factual information so that citizens can form their own opinions as to what is in their best interest.

3. Survey and responses

A survey was mailed to selected constituent groups that will likely be affected by components of the statewide water plan (Appendix A). The survey was designed to elicit input about what would be useful in an online citizen's guide. By soliciting their input, it gives people a voice in what gets put into the guide and provides important information on how to enhance effective participation. I am hopeful that the participants will feel ownership of the guide, ultimately empowering them to become more involved in the statewide water planning process.

Responses to the survey support the need for an online citizen's guide. Of the fifteen organizations surveyed, I received thirteen responses. Of the respondents, nine have participated or will participate in some capacity with the development of the statewide water plan. Seven

organizations are directly involved with members serving on at least one of the state-appointed advisory committees.

A primary purpose for the survey is to determine what people would find most useful in an online citizen's guide. Through my observation, conversations with others, and knowledge of the water planning process, I determined that a citizen's guide to statewide water planning should include a description of issues, a description of EPD's planning process and framework, a description of opportunities for public involvement, and a glossary of terms. To help support my observation, I listed the four subject areas and asked respondents to rate their importance on a scale of one to five, with five being most important. Results are in Table 4:1. All four suggested areas received high ratings of importance, with a description of the issues to be addressed in the water plan being the highest at 4.8, and a glossary of terms being the lowest at 3.9.

Table 4:1 – Responses Regarding Importance of Specific Content in Online Citizen's Guide

Suggested Contents of Citizen's Guide	Average Rating
Description of issues that will be addressed by the statewide water plan	4.8
Description of opportunities for public involvement	4.5
Description of Georgia EPD's planning process and framework	4.1
Glossary of terms	3.9

In addition to rating the importance of these four subject areas, respondents provided other suggestions that they felt would be helpful to include in an online guide. I sorted and prioritized these suggestions based on available information and whether they fall within the scope of this project. Table 4:2 shows the suggestions from participants in the left column, and my comments about whether it can be included or not in the right column.

All suggestions that I answered "yes" will be incorporated into the citizen's guide. Of the 19 suggestions, only three will not be included because either we will not know the information

Table 4:2 – Sorting and Prioritizing Suggestions from Respondents

Additional Suggestions from Respondents	If Possible to Include
Name and affiliation of Water Council and Advisory Committee members (several suggested)	Yes
How were they appointed?	Yes
How did EPD include all stakeholder groups?	Yes
Who makes final decision?	Yes
Time frame?	Yes
Legislature involvement?	Yes
Meeting dates and locations (several suggested)	Yes
Results of committee meetings	Yes
Information about outreach to stakeholders	Yes
With description of issues, include explanation of relevance so citizens can understand significance of plan	Yes
Acknowledge issues that are not being addressed	Yes
Current state of water affairs in GA	Yes
Maps indicating scale and location of specific water quality challenges.	Yes, I will include maps for relevant to topics
Understand role of development, roads and other infrastructure that impacts hydrological cycle and quality and amount of water we have to manage	Yes, I will be discussed when discussing stormwater and related issues (what causes the problems that we are facing)
Anything to facilitate quick and easy understanding by general public	Yes
Background info on current water use, water quality, how much water we have, project to have, and project to use; Is global climate change a consideration? Modeling projected growth? Ecological impacts of increasing water use for human consumption; Economic costs/benefits of conservation as strategy for increasing water capacity	Great suggestions. Yes, I will discuss impacts. If/as this information becomes available, I will include it. Most of these were discussed in great length at March 23 SAC meeting. Some of this information is not available/ does not exist yet (had a discussion about water use, future water use, how much we have now, projected growth concerns, and cost-benefits, and EPD does not have much information about this and lacks funding to get it. SAC members expressed frustration about crafting policies without this info).
Analysis of issues (why IBT bad, disadvantage of reservoirs, why can't growth be directed where there are water resources to sustain growth)	I am not advocating positions in guide because important to be unbiased to maintain credibility.
Basic synopsis of GA water law vs. proposed changes in plan	We will not know proposed changes until we know proposed policies that result from the planning process.
Realistic and urgent conservation plan and timeline	I am not advocating positions in guide because important to be unbiased to maintain credibility.

until the end of the process and did not fall within the scope of the project. I was pleased to receive many suggestions that fit within the scope of the project and could be incorporated into the guide, thus strengthening the guide, responded to the needs of stakeholders, and increasing the likelihood of effective public participation.

Negotiating Program and Learning Objectives

Educational programs have both political-economic agendas, or program objectives, and educational-learning agendas, or learning objectives (Cervero and Wilson 1994). Program and learning objectives provide direction for the instructional program and benchmarks for evaluation (Caffarella 2002). According to Caffarella, program objectives are critical because they "provide clear statements of the anticipated results to be achieved through education and training programs" (2002, 156). Program objectives are not only "clear statements of anticipated results," but also "serve as the foundation for instructional plans, concrete guidelines for developing transfer-of learning plans, and benchmarks against which programs are evaluated" (Caffarella 2002, 156-157). For Cervero and Wilson (1994), program objectives should address not only the nature of the content, but also how the results address political and economic relationships among stakeholders.

Program objectives

Table 4:3 lists the three program objectives for this particular project with the associated action steps.

Each program objective relates to my stakeholders' needs and interests. Through my experience, knowledge, observations, conversations, I decided to develop the citizen's guide. These steps, along with my survey of stakeholders and review of other guides, helped me identify the content, format, and layout ideas. Through my discussions and survey of

Table 4:3 – Program Objectives

Program Objective 1:	Develop an online citizen's guide to statewide water planning in Georgia
Action Steps:	• Review materials and develop understanding of past experiences to determine needs • Survey stakeholders to assess needs • Research other citizen's guides, both online and hard copies, for content and structural ideas (discussed in Chapter Five) • Determine components of guide from stakeholder responses and personal knowledge • Find information available for each component and organize it in a way that is easily understandable • Create structure for online guide that is user friendly • Find domain to host website • Work with website designer to design website • Post components on website
Program Objective 2:	Encourage effective public participation through use of guide
Action Steps:	• Send emails to all contacts to make them aware of the guide and its purpose • Encourage organizations to provide a link on their website to the guide • Encourage those organizations to inform other organizations • Utilize all opportunities to inform others about the guide, including conference presentations
Program Objective 3:	Determine how the citizen's guide will be maintained after graduation
Action Steps:	• As water issues coordinator at Georgia Wildlife Federation, I will maintain website • Coordinate with others, including the Georgia Water Coalition, to supply information for the guide and to ensure that it remains up-to-date

stakeholders and conversations with colleagues, I determined that developing an online guide would help encourage effective public participation because the survey responses indicated a desire for an educational program that discusses the various components of the statewide water

planning process. The guide is a way to provide my stakeholders and a variety of other citizens with educational information that they need to influence the planning process. To ensure effective public participation, I will publicize the guide to my colleagues and encourage organizations to provide a link to the guide on their websites, as the majority have already agreed to do. For the guide to help my stakeholders participate more effectively, it must be maintained and updated regularly as new information becomes available. To ensure sustainability of the guide, I will maintain it through my position as water issues coordinator at Georgia Wildlife Federation.

Learning objectives

Learning objectives are what participants should be able to know, feel, and do as a result of the educational program. Learning objectives are determined based on program objectives, so there is continuity between the two types of objectives. The primary difference between program objectives and learning objectives is that program objectives focus on the education program as a whole, while learning objectives focus on individual participants (Caffarella 2002). Table 4:4 shows the learning objectives for this project.

The learning objectives are directly related to specific stakeholder needs and interests. Objective One addresses the need for effective participation, because if citizens understand how to be involved then they can make sure that their values are incorporated into the decision-making process and proposed policies. Objectives Two and Three recognize that citizens need a basic knowledge of key water issues so that they can recognize how the proposed policies will affect them and their communities. I have incorporated all of the suggestions that my stakeholder have made, except for the few that do not fall within the scope of this project or for

Table 4:4 – Learning Objectives

Learning Objective 1:	Interested citizens will understand how they can be involved in the statewide water planning process.
Learning Objective 2:	Interested citizens will gain knowledge about key water issues to be addressed in the plan.
Learning Objective 3:	Interested citizens will recognize how the statewide water plan will affect them and their community.
Learning Objective 4:	Interested citizens will feel empowered to participate and express their views in the statewide water planning process.
Learning Objective 5:	Interested citizens will become aware of the online citizen's guide and its purpose.

those that the information is not available at this time. Objective Four recognizes that citizens can feel empowered when they have knowledge about how to participate in the planning process, which will make participation less abstract. In the guide, I have provided specific action strategies for citizens to help them understand the steps they can take to influence the process. Objective Five is achieved by spreading the word about the citizen's guide to as many interested citizens as possible, which many of my stakeholders are ready to help me do that through word of mouth and by providing a link to my citizen's guide on their website.

Negotiating the Development of the Instructional Program

Developing an instructional plan "involves designing the interaction between learners and instructors and/or learners and resources materials for each education and training activity" (Caffarella 2002). When determining the content of an educational program, the content should be evaluated based on the learning objectives by answering the following questions. What must participants know? What should participants know? What could participants know?

This evaluation is based on learning objectives, participants' knowledge and experience, and demands of social and organizational context (Caffarella 2002).

Table 4:5 on the following page is an instructional plan for developing an online guide to help citizen's effectively participate in the statewide water management plan. The instructional plan is based on Caffarella's instructional plan template (2002). It takes into account specific stakeholder needs and interests, program and learning objectives, how they will be achieved, and key points to emphasize.

Devise transfer of learning plans

Planning strategies enable participants to transfer their learning to social and organizational contexts after the program. According to Caffarella, transfer of learning (TOL) is "the effective application by program participants of what they learned as a result of attending an education or training program" (2002, 204). Based on Caffarella's Interactive Model, TOL is connected to context, program ideas and needs, objectives, instructional plan, and evaluation. TOL is often thought of in behavioral terms, so that what has been learned and transferred can be observed as a change of behavior, knowledge, skill, and/or attitude. Some important considerations when devising TOL plans are the amount of time, effective strategies, and the people involved (Caffarella 2002).

To ensure transfer of learning for this project, I will design an action plan for involvement and include it with the online guide so that citizens can apply what they have learned. The action plan will include personal actions that people can take with varying levels of involvement. The action plan will include opportunities available for the public throughout the actual water planning process. It will also include ways for citizens to share their opinions about

Table 4:5 – Instructional Plan

Title: Designing an online citizen's guide to statewide water management planning in Georgia			
Learning Objectives ***The participants will…***	**Content Heading**	**Key Points to Emphasize**	**Instructional Techniques**
Understand how they can be involved in the statewide water planning process.	Involvement in water planning process	• Identify and discuss opportunities for public involvement • Action plan for participation	Website, conversations, and presentations
Gain knowledge about key water issues to be addressed in plan.	Contents of online guide	• Identify and describe issues in water plan	Website
Recognize how the statewide water plan will affect them.	Recognition of their role	• Discuss relevance of water issues and general ways issues could affect public	Website, conversations, and presentations
Feel empowered to participate and express their views in the water planning process.	Empowerment to become involved	• Provide interested citizens with information they need to effectively participate • Action plan for participation • Overcoming participation challenges	Website, conversations, and presentations
Become aware of the online citizen's guide and its purpose.	Market online guide	• Notify all contacts of online guide • Encourage orgs to put a link to online guide on their websites	Publicize via email and word of mouth, provide links on various websites, conversations, and presentations
Instructional resources and equipment needed: **For instructor:** Computer with Internet access Website designer Information to be content of online guide **For participants:** Computer with Internet access			

Source: adapted from Caffarella 2002, Exhibit 9.12.

the water plan with legislators, because the statewide water plan will be presented to the General Assembly in 2008 for final approval.

Barriers to consider

Public education and the online citizen's guide cannot overcome all barriers to citizen participation. While the guide has attempted to address the following barriers, some people might still be discouraged from participation. First, citizens may feel that they still lack the knowledge and confidence needed to participate effectively. I have tried to overcome these possible concerns by provided concise information without technical and legal jargon so that citizens can understand the important factors and feel knowledgeable enough to participate. If they still lack the confidence, then it would be helpful for them to talk to others who participate regularly who may be able to further demystify the participation process.

Second, personal motivations may hinder participation. The 250+ participants have no decision-making authority, which may discourage some from participating to their full potential. They may not feel that their input will have any effect on the decision-making process. Also, the town hall meetings occur towards the end of the planning process, leaving some citizens feeling that their voice will have little if any effect on the final product. If citizens are discouraged by these factors, participation is the only way to overcome these concerns, and the citizen's guide will help them participate. EPD and the Water Council will not be able to ignore the input and concerns of proposed policies from a variety of citizens. If they do, the final decision-making authority rests with the General Assembly, and legislators generally listen to their constituents. The alternative is to not participate, which would be a way to ensure that these concerns become reality.

Finally, citizens may be discouraged from past stakeholder experiences in which they felt that bureaucrats had made decisions prior to the stakeholder involvement process, and the public was included merely to gauge support for those decisions. EPD has designed a large public involvement process, which will help overcome many of the problems associated with past stakeholder experiences, such as ignoring stakeholder input. A large number of stakeholders expressing concerns about particular issues is difficult to ignore and will only cause problems for EPD when they try to implement these policies. Again, the alternative is to not participate, which would ensure that bureaucrats get what they want without consideration of public values. The citizen's guide will help citizens participate more effectively and understand the process so that they can speak out if problems with the process arise.

Negotiating the Program's Financing and Marketing

Managing program expenses and devising marketing plans are important components of program planning, depending on how the program is structured. A planner must estimate program expenses and determine how a program is financed. The way that a program is marketed influences who will participate (Caffarella 2002).

Minimal expenses are needed to design and maintain the online citizen's guide. I will work with a website designer to assist with structuring the website in a user-friendly format. I will maintain the online guide as part of my job as water issues coordinator at Georgia Wildlife Federation. Recent grant proposals included requests for funding to develop and maintain the guide.

There are five dimensions of program marketing – audience, product, price, place, and promotion (Caffarella 2002). My audience is any concerned citizen who would like to participate in the statewide water planning process. These individuals could be acting on their

own or as members of an organization that is participating in the planning process. The product is an online citizen's guide that will be available to the public to help promote effective public participation. There is no price associated with using the guide. The guide will be located on the Internet. By having a web-based guide, it is easily accessible and free for citizens to use.

Promotion is an important concept to consider because I would like this guide to reach all concerned citizens interested in participating in the development of the statewide water plan. Once the guide is ready for online public use, I will send an email to my contacts that explains the purpose of the website and encourages them to use it. I will contact my survey recipients who agreed to put a link to the guide on their website to let them know that it is ready. I will encourage the Georgia Water Coalition leadership to endorse the website, which connects me to 132 organizations, association, and businesses across the state that have an interest in how the state's waters are managed. I will ask those organizations that provide a link on their website to encourage other organizations to do the same.

Negotiating the Evaluation of the Program

Cervero and Wilson (1994) and Caffarella (2002) have similar definitions of evaluation, namely, "judging the value or worth of education and training programs" (Caffarella 2002, 227). Evaluation data can be collected at least four times during a program – prior to the program, during the program, immediately after the program, and well after the program. Every program is evaluated by all of the stakeholders; the key question is what evidence – qualitative or quantitative – and criteria they use. The goal is to negotiate the evaluation of the program in a way that provides accurate and comprehensive information for the questions that stakeholders want answered (Caffarella 2002).

I evaluated the need for the program at the beginning through a needs assessment and survey to select constituent groups. I will evaluate the citizen's guide based on how well I incorporated suggestions from my survey respondents. Due to the time limitations of this project, I cannot evaluate it in the most comprehensive way. It is impossible to do a hindsight evaluation. On the online guide, I will provide a section where users can send feedback on ways to make the guide more helpful. I will also measure hits on the website to determine how many people are using it and how long they stay on the website.

When evaluating this project, I must answer the following questions about the guide:

- Did I develop an online citizen's guide to statewide water planning in Georgia?
- Did I include as many suggestions as possible and feasible from my survey respondents?
- Does the guide contain all relevant content to help citizens participate more effectively?
- Is the guide user friendly?
- How many organizations have a link to the guide on their organization's website?
- How will the guide be maintained for the next two years?

At a point in the future, I must also answer the following broader questions:

- Do interested citizens have a better understanding of the statewide water planning process and the issues that it will address?
- Do interested citizens recognize the importance of the statewide water plan and how its components may affect them?
- Are interested citizens empowered to participate in the statewide water planning process after visiting the online guide website?
- Are interested citizens aware of the citizen's guide, and are they using it to effectively participate?

The selected program planning models have provided me with a framework for designing a citizen's guide. The steps within these planning models provide a methodology for considering and balancing the needs of my stakeholders in the development of this guide. As I have learned through my literature review, research, and interaction with colleagues, it is important for those who would like to participate in the water planning process to have helpful educational materials that help them understand the water issues and demystify the planning process. Through these program planning models, I have designed a guide that reflects stakeholder needs and will help them participate more effectively in a democratic participation process.

CHAPTER 5

THE CITIZEN'S GUIDE TO STATEWIDE WATER PLANNING IN GEORGIA

This chapter discusses my review of various citizen's guides in the development of my online citizen's guide. I analyzed a variety of guides related to environmental planning and management and interviewed several people from organizations responsible for the guides. The following is a discussion about the common elements among citizen's guides, characteristics that make guides user-friendly, an overview of my citizen's guide, and how my guide differs from EPD's website. The Online Citizen's Guide to Statewide Water Planning in Georgia is at www.citizenswaterplanning.org.

Review of Citizen's Guides

To develop the online citizen's guide to statewide water planning in Georgia, I researched a variety of citizen's guides. There are two principle types of guides: 1) participation guides, which both explain the issues and describe ways for citizens to get involved or take action, and 2) issues guides, which only explain the issues. Issues guides are more common than participation guides. Appendix B provides a list of all guides that I consulted while conducting my research, writing my thesis, and designing my online guide. Of these twenty guides, the eight participation guides were particularly useful in choosing the format of my guide. Three of these guides are Georgia-specific.

After I narrowed my list down to eight participation guides, I called the organization or government entity that produced each guide to determine which sections citizens found most useful. I asked what general feedback they had received from citizens, and whether they had done a formal evaluation to determine the guide's effectiveness. I interviewed representatives

from five of the eight organizations by telephone. Everyone that I talked to said that they had received positive feedback from people saying that their guide was useful and that the content was helpful. Each of them said that people ask for or about it. The Jefferson County, Colorado Planning and Zoning Department was the only group that had performed a survey to determine the effectiveness of their guide, "Water Smarts." Those survey results are discussed later in this section.

I closely examined the eight participation guides to identify the elements included in this type of guide. I used these guides to develop ideas about what to include in my guide and to assess the need for the different pieces. I identified ten principle elements:

1. Citizen Action Plan or Strategies
2. Description of Purpose
3. Background Information
4. Description of Laws and Statutes
5. Description of Planning Process
6. Description of Decision-making Process/ Bodies
7. Fact Sheets
8. Contact List
9. Glossary
10. Visual Aids

Every guide included certain common elements, such as a description of the purpose. All eight participation guides also included, by definition, a citizen action plan or strategies for public involvement and participation. Other elements, such as fact sheets and visual aids, were less common. Table 5:1 gives a comparison of the content of each of these participation guides.

Table 5:1 – Comparison of Content in Participation Guides

	A Citizen's Guide to Fighting Water Pollution in Georgia	Citizen Dam Prevention Manual (GA)	Citizen Involvement Handbook (Multnomah Co., OR)	Get the Dirt Out (GA)	Planning & Zoning Processes: A Citizen's Handbook (Jefferson Co., CO)	Rural Guide to Informed Citizen Involvement (ID)	South Branch Watershed Assoc. Citizen's Guide (NJ)	Water Smarts: A Homeowner's Guide to Mountain Groundwater (Jefferson Co., CO)
Citizen Action Plan or Strategies	✓	✓	✓	✓	✓	✓	✓	✓
Description of Purpose	✓	✓	✓	✓	✓	✓	✓	✓
Background Information	✓	✓	✓	✓		✓		✓
Description of Laws and Statutes	✓	✓	✓	✓			✓	✓
Description of Planning Process	✓	✓	✓	✓	✓			
Description of Decision-making Process/ Bodies	✓	✓	✓	✓	✓		✓	✓
Fact Sheets							✓	
Contact List	✓	✓	✓	✓	✓		✓	✓
Glossary	✓	✓		✓	✓			✓
Visual Aids				✓	✓			✓

Below is a brief description of each element and the context in which this content is necessary to a guide's purpose. Specific examples are provided for guides that were particularly helpful or interesting. I have included comments from my interviews about these guides. This section also includes a description of why each element was important to include in my guide, or an explanation of why the element was not necessary based on the context.

1. Citizen Action Plan or Strategies

The difference between participation guides and issues guides is that participation guides go beyond merely describing the issues by providing citizens with action plans and strategies to help them participate more effectively in decision-making processes. For example, the "Rural Guide to Informed Citizen Involvement" is designed specifically to get citizens more involved in decision-making processes. It recommends forming alliances with like-minded organizations and provides three specific strategies: citizen-government connection, community forums for citizen outreach and education, and media outreach.

Another example is the "Citizen Dam Prevention Manual." It discusses opportunities for citizen involvement during four different stages of dam permitting: before permits are sought, during permit review and drafting, after permits are drafted, and after the final permit is issued. The "toolkit" contains tips on writing press releases, writing letters to decision makers, and giving speeches. It also provides a list of talking points and questions to ask when talking to legislators, citizens groups, and the general public.

In interviews, both Bill Kibler, Executive Director of the South Branch Watershed Association, and Kathleen Todd, Executive Director of Multnomah County Citizen Involvement Committee, mentioned that having the citizen participation section was very helpful because it can be scary for citizens to participate for the first time. They felt that their guides help

demystify the public participation process and help citizens not feel intimidated to participate (*pers. comm.).*

Because my guide will be a participation guide, it is essential to include a citizen action plan or strategy. Similar to the "Citizen Dam Prevention Manual," I decided it was important to provide citizens with strategies for participating at every stage of the process. To accomplish this, I developed a citizen action plan based on the timing of the planning process. The website gives citizens suggestions for participating before and after the policy recommendations are developed. Because the process will unfold over the next two years, the citizen's action plan can be updated if new opportunities for participation develop. I also found it helpful to include tips on speaking and writing letters to public officials, similar to the "Citizen Dam Prevention Manual" and the "Citizen Involvement Handbook" of Multnomah County, Colorado.

2. Description of Purpose

Every guide begins with a description of its purpose. The purpose helps explain why the guide is useful and needed, who the audience is, and how the audience should use it.

For my guide, the home page of my website gives the description of the guide's purpose. The page states that the purpose of the citizen's guide is "to help citizens participate more effectively in Georgia's Statewide Water Planning Process."

3. Background Information

Most of the guides provide background information, which puts the need for the guide in context with what is currently taking place in that particular location. For example, the "Citizen Dam Prevention Manual" provides information about how increased growth and demand is putting stress on Georgia's water supplies, but also explains that damming a river should be

weighed carefully against other options for increasing municipal supply, such as water conservation.

My guide includes background information about the need for a comprehensive statewide water management plan in Georgia. This background section lists many of the key water management issues facing Georgia and explains why a comprehensive plan is needed to deal with these issues.

4. Description of Laws and Statutes

Guides that directly relate to specific legal issues include a description of laws and statutes that govern the topics being addressed in the guides. For example, Georgia Center for Law in the Public Interest's (GCLPI) "A Citizen's Guide to Fighting Water Pollution in Georgia" provides an overview of the Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) permitting program under Section 402 of the Clean Water Act. Because understanding the Clean Water Act and Section 402 is critical to fighting water pollution, this section is very helpful for a guide specifically targeted to water pollution issues. Justine Thompson, Executive Director of GCLPI, noted that parts of this section are too technical and should focus more on covering the basics (*pers. comm.*).

I decided not to include a description of laws and statutes in my online guide for several reasons. First, the topic of water management is so broad that a discussion of any specific statute would be too detailed for a general overview of these issues. Second, the public participation process is designed to gather input from stakeholders about the real world effect of proposed policies and does not contemplate including citizens in discussions about legal technicalities. Third, a description of laws and statutes is not even included in EPD's stakeholder materials. Fourth, a detailed knowledge of specific laws and statutes is not necessary for citizens to

participate effectively, because the stakeholder meetings will be more general in nature and will likely not focus on any specific laws. Fifth, most citizens who use the guide will probably not be lawyers and may feel overwhelmed by a technical discussion of legal specifics.

5. Description of Planning Process

The inclusion of this element depends on the type of guide and the context for which it was designed. For example, "Water Smarts" is designed for homeowners who depend on mountain groundwater. There is no planning process associated with this topic, so this guide does not have a description of a planning process. However, in "Planning & Zoning Processes: A Citizen's Handbook," the planning process is central to the context of the guide, so the planning process is described in a flow chart that makes it easy to understand.

The planning process is essential to my guide, because citizens will not be able to participate effectively without understanding the process. Therefore, my guide includes a description of the planning process, a schedule of all meetings, and a timeline for the four water management objectives. It explains how citizens can provide their input in each stage of the planning.

6. Description of Decision-making Process and Bodies

Nearly all of the guides contain a description of the decision-making process and bodies because most of the guides address specific issues in a particular location. The only guide that does not include this element is the "Rural Guide to Informed Citizen Involvement," because this guide does not apply to any specific location, issue, or planning process. This guide is a general guide to help citizens form alliances that could be applied to any issue in any part of the country. Therefore, there is no specific decision-making process to describe.

The "Citizen's Guide" produced by the South Branch Watershed Association contains a description of the municipal decision-making process and governing bodies. According to Bill Kibler, citizens find this useful because many of them do not understand how the planning board works (South Branch Watershed Association, *pers. comm.*).

Because my guide applies to a specific water planning process within the state of Georgia, my guide includes a detailed description of the decision-making process and the decision-making bodies involved. For example, the roles of the advisory committees, the Water Council, and the legislature are set forth in a section about the water planning process.

7. Fact Sheets

Only one of the guides includes fact sheets. The "Citizen's Guide" produced by the South Branch Watershed Association has a list of 27 fact sheets covering various topics, such as aquifers, erosion and sedimentation control, floodplain protection, green development, wetlands, and zoning. These fact sheets are helpful one-page documents that citizens can print and take with them to meetings. According to Bill Kibler, citizens can learn enough from these fact sheets not to feel scared about participating (South Branch Watershed Association, *pers. comm.*).

I decided not to include a specific fact sheet section in my guide for several reasons. First, even though there is not a specific fact section, the guide does include facts about the topics to be discussed in the planning process. For example, within the section on maximizing returns, there is a separate page explaining, illustrating, and giving statistics on each of the three main topics: interbasin transfers, septic systems, and land application systems. These pages are printable, and serve a similar purpose to a separate fact sheet section. Second, because only one of the reviewed participation guides had fact sheets, I determined that this was not an essential

element to include at the outset. As the guide develops, I may consider adding this type of information where it would be most helpful.

8. Contact List

Almost all of the guides include a contact list if citizens need additional information. The lists often include federal and state agencies, local government boards and offices, and nonprofit organizations.

My guide includes contact information for state agencies, a list of associations and nonprofit organizations that have a water interest, and a list of local river basin groups. This contact information should be helpful for citizens who are seeking more information.

9. Glossary

The guides that include a glossary are those that address specific issues, such as fighting water pollution, dam prevention, and water quality and quantity concerns related to mountain groundwater. The guides that do not include a glossary cover general topics, such as citizen involvement in a specific location.

My guide covers a broad topic, because it relates many diverse water issues. However, I decided that including a glossary would be a helpful way to educate citizens about any specific terms that they might not understand.

10. Visual Aids

Only three of the selected guides contain visual aids. Both of the guides produced by the Planning and Zoning Department of Jefferson County, Colorado, contain diagrams and flow charts that are very useful. The "Planning & Zoning Processes" handbook has a flow chart that explains the submittal and review procedure for a rezoning request. The "Water Smarts" guide has illustrations and helpful diagrams, such as the cross-section of an aquifer, a diagram of a

septic system, and the cross-section of a typical drilled mountain well. "Get the Dirt Out" has an accompanying field guide with pictures of good and poor applications of construction design such as silt fences, rock filter dams, sediment basins, and vegetation.

In my guide, I included visuals aids where possible. Where EPD had created helpful visual aids, such as a diagram of the public involvement process, I included these on the website. These diagrams are easier to understand than verbose textual descriptions.

I also added additional visual aids. For example, I used diagrams to illustrate a septic system and a land application system in the discussion about maximizing returns. Also in this section, I created a chart of the policy options instead of writing them out in lengthy paragraphs.

User-friendliness

Determining whether a guide is user-friendly is more difficult than looking at what elements are contained in each guide because it is subjective in nature. Through my research of citizen's guides and discussions with people who developed these guides, I found five characteristics that make citizen's guides user-friendly. With my citizen's guide, I have tried to address each of these user-friendly characteristics.

1. Online availability

All of the participation guides that I reviewed are available online, which makes them easily accessible to a wider audience. The Internet is the most cost-effective way to disseminate this type of information. In contrast, some of the issue guides are only available in hardcopy and had to be purchased through the mail. The "Citizen's Guide" produced by the South Branch Watershed Association was only available in hardcopy at one time, but they found that putting it on the Internet was much more helpful and user-friendly (Bill Kibler, South Branch Watershed Association, *pers. comm.*).

2. Easy-to-find information

The guide should be organized in a way that makes sections easy to find, because readers do not want to spend too much time looking through pages to find specific information. Many of the guides I reviewed are written as hardcopy and are only available in a PDF format. The problem with these is that they are difficult to search through. It is better for a guide to be in an interconnected website format so that readers can browse through information quickly and easily.

3. Simplified information

Each section of the guide needs to get to the point quickly and provide simplified information that is not written in technical, scientific, or legal jargon. Justine Thompson said she felt that "A Citizen's Guide to Fighting Water Pollution in Georgia" was too technical in certain places, and that the most useful sections were the simple ones, such as the contact list and permit list (GCLPI, *pers. comm.*). Bill Kibler also mentioned that he thought that certain sections of the South Branch Watershed Association's "Citizen's Guide" were too lengthy (*pers. comm.*).

4. Visual aids

Diagrams, charts, and maps are very effective and help users find what they want to know quickly.

5. Updateability

Because the Georgia water planning process is developing as it unfolds, it is essential that my guide be available online so that it can be updated as information becomes available and as the process moves forward. When guides are laid out in website format instead of PDF format, they are much more useful because information can be update easily and is not out-of-date, unless the website is not updated regularly. Kathleen Todd mentioned this is a problem with the

Multnomah County's "Citizen Involvement Handbook," which I found to be true because the phone number listed no longer works. This guide was produced in 1999, and, due to a lack of funding, it has not been reproduced since, despite requests from citizens for them to update it (Kathleen Todd, Multnomah County Citizen Involvement Committee, *pers. comm.*).

Examples of Effective Guides

Of the guides that I surveyed, two stood out as being effective and very useful. Below I describe their purpose, why they are more useful than other guides, and give additional information.

1. "Get the Dirt Out"

The Upper Chattahoochee Riverkeeper and the Georgia Center for Law in the Public Interest started "Get the Dirt Out," a program aimed at reducing stormwater runoff from construction sites – a leading source of nonpoint source pollution in Georgia. The program provides training workshops and materials that can be downloaded from its website for citizens, developers, and local governments on the new Georgia Construction General Permit, its implementation, and its effectiveness. The manual contains information about the effects of dirt in our rivers, the Clean Water Act and the General Permit, erosion and sedimentation control through best management practices, and permit enforcement. Each section is clearly marked to help the reader find information quickly (Get the Dirt Out 2005).

One of the reasons why this manual stood out from the others is that the leaders host educational workshops across the state to help educate citizens about the information contained in the manual. Since its inception in 2005, program leaders have hosted 25 citizen workshops with 305 participants, three government workshops with 135 participants, and one workshop for lawyers with 30 participants. They have taught 21 trainers and host quarterly meetings that

many trainers and partners attend regularly. They have distributed over 2000 stormwater brochures (Alice Champagne, Upper Chattahoochee Riverkeeper, *pers. comm.*)

Several success stories are linked to this program. For example, a member of the Georgia Wildlife Federation was fishing in the Towliga River and noticed muddy water entering the river from the Little Towliga River. He traveled upstream to find dirt pouring into the river from an adjacent construction site. He alerted a staff member at Georgia Wildlife Federation who had recently participated in a "Get the Dirt Out" workshop. Together, they prompted EPD to issue a stop work order until the construction site complied with Georgia's erosion and sedimentation laws. Because of this effort, the Georgia Wildlife Federation collaborated with the Upper Chattahoochee Riverkeeper and the "Get the Dirt Out" program to produce laminated cards for tackle boxes to help anglers identify construction site problems. The cards also provide contact information for reporting a problem.

2. "Water Smarts: A Homeowner's Guide to Mountain Ground Water"

The Planning and Zoning Department of Jefferson County, Colorado, is committed to "promoting informed and active citizen participation in government" (Planning and Zoning website 2006). Its website is the most helpful local government website I have seen for encouraging citizen participation. It offers citizens a variety of educational guides and community and land use plans to help citizens participate more effectively in decision-making processes. Two of the participation guides that I used are from this website – "Water Smarts: A Homeowner's Guide to Mountain Ground Water " and "Planning & Zoning Processes: A Citizens Handbook."

I found "Water Smarts" to be one of the better guides because it did not contain a lot of technical information. Instead, it included summaries of groundwater issues that interested

citizens could learn from without spending much time studying it. "Water Smarts" is a guide that is dedicated to groundwater issues in the Colorado Rockies. It discusses water quantity and quality, wells, septic systems, water rights, and lifestyle impacts. It offers practical advice to homeowners by providing tips on various topics, such as septic systems, and a set of frequently asked questions separated into general, legal, and lifestyle categories. It has helpful diagrams and illustrations, which make it easy to read and understand. It also includes a pullout poster of the water cycle in this particular environment (Water Smarts 2002).

Of the participation guides that I selected, "Water Smarts" is the only one that has done a follow-up reader response survey to determine whether readers found the guide useful and whether they will take action to protect groundwater resources. Of the survey respondents, 94% read the entire guide and 90% found the water quantity and water quality sections most useful. When asked about testing well water, 41% said that after reading the guide they plan to start testing their well water periodically, and 34% said that they are already doing so. When asked if they learned something new, 74% responded that they had. More than half of the participants provided additional comments on the back page of the survey, mostly praising the guide and offering additional suggestions (Water Smarts Reader Response Survey Results Summary 2002).

The Online Citizen's Guide to Statewide Water Planning in Georgia

The Online Citizen's Guide to Statewide Water Planning in Georgia is a user-friendly guide to educate citizens about the water planning process, management objectives, water issues, and EPD's proposed policies so that they can participate more effectively in the planning process (Appendix C). It also contains a citizen action plan, with sample action plans for an individual and an organization, and a meeting schedule so that citizens know how and when to participate. It contains a glossary of water-related terms and a contact list if they would like additional

information from of other sources. The guide that I created can be found at the following address: www.citizenswaterplanning.org.

Through a literature review and program planning theory, I learned that it is important to provide unbiased information and not to exert my beliefs throughout the guide. This task was not easy for me, because I have drafted position papers on water issues through my job at Georgia Wildlife Federation. However, my personal views and criticisms are not relevant for the purpose of this guide, and it would be inappropriate and irresponsible for me to include them. I do explain the implications of each water topic so that citizens can understand how the issues affects the public and downstream users. For example, under Management Objective Two: Maximizing Returns, I explain the implications of interbasin transfers (IBT) on downstream users and what affect IBT has on return flow. I also provide a list of statistics so that citizens can use that information and make their own decisions about IBT.

The main advantage to having the citizen's guide online is that it is constantly being updated. Additions and changes will continue over the next two years as Georgians develop this first installment of the Comprehensive Statewide Water Management Plan. It is also interconnected by links, instead of in PDF format, so that citizens can easily find the information that they need. Each section is printable so that readers can take the information to the meetings.

How the Online Citizen's Guide differs from EPD's website

Georgia EPD also posts information on an official statewide water planning website. The actual information contained on both websites is similar. This is intentional because people need to have the same information. However, my guide differs from their website in several ways, which I have divided into two main categories – presentation and tone.

1. Presentation

First, my citizen's guide is shorter and more concise, because citizens do not need to spend hours reading reports to be able to participate effectively. They need to be able to quickly read about the proposed frameworks and policies, so that they can form their own opinions about how these proposed policies may affect their lives. Second, my citizen's guide is easier to navigate. Each section is clearly marked, and they are all interconnected. For example, the Meeting Schedule is under the Water Planning Process heading, but readers can link to it through the Citizen Action Plan as well. Third, it presents the proposed policies, the frameworks, and the concepts directly on the website instead of embedding them in PDF files that have to be opened and searched.

2. Tone

The citizen's guide is easier to understand. Through my research, I have learned that using technical, scientific, or legal jargon may overwhelm citizens and discourage participation; therefore, I tried to use terms that are easier to understand. I also include a glossary in case citizens need to look up words. The citizen's guide is designed for people who would like to become involved but who are less knowledgeable than others who may have been participating in water management activities for years. EPD's website has more technical information that would be more useful to those who are very involved and have a lot of knowledge about these issues going into the planning process.

Because of its tone and presentation, my online citizen's guide will be helpful for participants who are not water experts and who do not have many hours to spend digging through the official documents. Through the guide, they can gain a basic understand that will

enable them to participate. Participants who are more knowledgeable and who more time to spend can use links to access the official site.

CHAPTER 6

CONCLUSION

Public participation is a valuable component of any environmental decision-making process. Public participation can improve the quality of decisions and result in less contentious implementation as a result of the public "buy-in" that occurs through the participatory process. Citizens can ensure that public values are incorporated into decisions and help resolve conflicts among competing interests.

This thesis, and the online citizen's guide that accompanies it, focuses on an aspect of public participation in environmental decision making that is often overlooked – education. Education is essential if stakeholders involved in a public participation process are to participate effectively. Without education, citizens will have a difficult time participating, which will lessen the quality of information that they provide. If citizens do not participate effectively, the benefits of public participation will not be realized.

Georgia is in the process of developing a comprehensive statewide water management plan that will coordinate the many piecemeal policies that have been put in place over the years to deal with individual water issues. Georgia EPD has designed one of the largest public involvement processes ever undertaken by a state agency in Georgia, including over 250 participants serving on various advisory committees. In addition, there will be a series of town hall meetings around the state to seek public input on the proposed recommendations of the water plan.

Because educational materials are essential to an effective public participation process, I determined that creating a user-friendly educational guide would assist citizens in the statewide

water planning process. Using the Caffarella's (2002) Interactive Model of Program Planning and Cervero and Wilson's (1994) program planning model, I designed a citizen's guide that reflects the needs of stakeholders through negotiating interests, thus helping them participate in a democratic participation process. This guide will enable citizens to participate more effectively and lead to a productive outcome in the water planning process.

Based on my methodology and results, the objectives were achieved. First, the research determined that public participation can have many benefits in a planning process, especially where the issues involve values-based decisions. Second, citizens cannot participate effectively without educational materials about the planning process and the relevant issues. Therefore, the benefits of public participation will not be realized if adequate educational materials are not made available to participants. Third, a citizen's guide to statewide water planning in Georgia was developed in order to help citizen's participate effectively. This objective was not fully completed, because the development of the guide will be an ongoing project that will unfold as the planning process continues.

This thesis provides several key contributions to the field of Conservation Ecology and Sustainable Development (CESD). First, it provides a study of public participation in the context of CESD. It explains why public participation is a key component of developing and implementing a water plan that will be sustainable. By facilitating citizen participation in the statewide water planning process, a sustainable water management plan can be created that reflects that values of Georgians and ensures the protection of our water resources for future generations. More generally, the benefits of public involvement are just beginning to be realized and appreciated. People are starting to see value of the public voice in the field of environmental management.

Second, it examines the relationship between values-based decisions, public participation, and education. Many decisions in the field of CESD are values-based decisions. Values-based issues cannot be resolved without public involvement. To make these types of decisions, a public participation process must be successful in gathering citizen input. But this cannot occur if citizen participation is not effective, and citizen participation cannot be effective unless citizens are educated about the planning process and the issues to be resolved.

Third, it is interdisciplinary. The CESD program at the Institute of Ecology emphasizes interdisciplinary studies. This thesis is an interdisciplinary study between the fields of CESD and adult education. Traditionally, public education has been an undervalued component of public participation. This thesis explains not only the benefit of public participation, but also why education is a necessary component to realizing these benefits.

Finally, it discusses how to develop an educational guide that takes into account stakeholder needs and interests. To my knowledge, this is the most comprehensive study done on how to develop a citizen's guide within the field of CESD. It can be used as a resource for anyone developing a citizen's guide on any environmental topic.

LITERATURE CITED

Apps, J. W. 1979. Problems in Continuing Education. Jossey-Bass, San Francisco.

Arnstein, S. 1969. A Ladder of Citizen Participation. Journal of the American Planning Association 35:216-224.

Beierle, T. C. and J. Cayford. 2002. Democracy in practice: Public participation in environmental decisions. Resources for the Future, Washington DC.

Beierle, T. C. and D. M. Konisky. 2000. Values, conflict, and trust in participatory environmental planning. Journal of Policy Analysis and Management 19:587-602.

_____. 2001. What are we gaining from stakeholder involvement? Observations from environmental planning in the Great Lakes. Environment and Planning C: Government and Policy 19:515-527.

Birkland, T. A. 2001. An introduction to the policy process: theories, concepts, and models of public policy making. M. E. Sharpe, Inc., Armonk, NY and London.

Board of Natural Resources (BNR). 2001. Water Issues White Paper. Atlanta GA. http://www.cviog.uga.edu/water/publications/whitepaper.pdf

Caffarella, R. S. 2002. Planning programs for adult learners: a practical guide for educators, trainers, and staff developers. 2nd ed. Jossey-Bass, San Francisco.

Caldwell, N. 2005 Feb 19. Why a state water plan. Presentation at Georgia River Network Conference, Milledgeville, GA.

Cervero, R. M. and A. L. Wilson. 1994. Planning responsibility for adult education: a guide to negotiating power and interests. Jossey-Bass, San Francisco.

Christy, D. R. 2003. Policy options for improving state management of agricultural water withdrawals in Georgia. M.S. Thesis, University of Georgia, Athens, GA.

Comprehensive Statewide Water Management Planning Act, O.C.G.A. § 12-5-520 to 525. 2004.

Creighton, J. L. 2005. The public participation handbook: making better decisions through citizen involvement. Jossey-Bass, San Francisco.

Depoe, S. P. and J. W. Delicath. 2004. Introduction. *In:* S. P. Depoe, J. W. Delicath, and M. F. A. Elsenbeer, eds. 2004. Communication and public participation in environmental decision making. SUNY Press, Albany, New York.

Docherty, I., R. Goodlad, and R. Paddison. 2001. Civic culture, community and citizen participation in contrasting neighbourhoods. Urban Studies 38:2225-2250.

Dryzek, J. S. 1997. The politics of the Earth. Oxford University Press, New York.

Fischer, F. 2000. Citizens, experts, and the environment. Duke University Press, Durham and London.

The Gallup Poll. 2006. Trust in Government. The Gallup Organization, Princeton, NJ. http://poll.gallup.com

Gamson, W. A. 1968. Power and discontent. The Dorsey Press, Homewood, IL.

Gauna, E. 1998. The environmental justice misfit: public participation and the paradigm paradox. Stanford Environmental Law Journal 17:3-72.

Georgia Water Coalition (GWC). 2004 Jan 22. Millions of Georgians send message loud and clear: water is a public resource. Georgia Water Coalition E-newsletter. Atlanta, GA.

Greenberg, M. and M. J. Lewis. 2000. Brownfields redevelopment, preferences and public involvement: a case study of an ethnically mixed neighbourhood. Urban Studies 37:2501-2514.

Haire, B. 2005 Jan 18. Grant to help conserve irrigation water, improve crop yields. Southeast Farm Press. http://southeastfarmpress.com/news/011805-water-grant/index.html

Joint Water Plan Study Committee (JSC). 2002. Final Report of the Joint Comprehensive Water Plan Study Committee to the Governor and General Assembly. Carl Vinson Institute of Government, Athens, GA. http://www.cviog.uga.edu/water/finalreport.pdf

Kerwin, C. M. 1999. Rulemaking: how government agencies write laws and make policy. 2nd ed. Congressional Quarterly, Inc., Washington DC.

Konisky, D. M. and T. C. Beierle. 2001. Innovations in public participation and environmental decision making: examples from the Great Lakes Region. Society and Natural Resources 14:815-826.

Kundell, J. E. 2005 June 7. Why Georgia needs a Comprehensive Statewide Water Management Plan. Presentation to the Georgia Water Council, Charles Loudermilk Conference Center, Atlanta, GA. http://www.georgiawatercouncil.org/pdf_files/why_comprehensive_water_plan.pdf

Kundell, J. E. and D. Tetens. 1998. Whose water is it? Major water allocation issues facing Georgia. Carl Vinson Institute of Government, University of Georgia, Athens, GA.

Kundell, J. E., T. A. DeMeo, and M. Myszewski. 2000. Developing a comprehensive state water management plan. Carl Vinson Institute of Government, University of Georgia, Athens, GA.

Laird, F. N. 1993. Participatory analysis, democracy, and technological decision making. Science, Technology, and Human Values 18:341-361.

Laurian, L. 2004. Public participation in environmental decision making. Journal of the American Planning Association 70:53-65.

Lyons, W. E. and D. Lowery. 1986. The organization of political space and citizen responses to dissatisfaction in urban communities: an integrated model. Journal of Politics 48:321-346.

McKinney, M. and W. Harmon. 2002. Public participation in environmental decision making: is it working? National Civic Review 91:149-170.

Mullins, G. W. and H. Neuhauser. 1991. Public education for protecting coastal barriers. BioScience 41:326-330.

National Research Council (NRC). 1996. Understanding risk: informing decisions in a democratic society. National Academy Press, Washington DC.

Pew Research Center (PRC). 1998. Deconstructing trust: how Americans view government. Pew Research Center for the People and the Press. http://people-press.org

Presidential/Congressional Commission on Risk Assessment and Risk Management (PCRARM). 1997. Framework for environmental health risk management. Final report 1. Presidential/ Congressional Commission on Risk Assessment and Risk Management, Washington DC.

Reich, R. B. 1985. Public administration and public deliberation: an interpretive essay. Yale Law Journal 94:1617-1641.

Ruckelshaus, W. D. 1996. Restoring public trust in government: a prescription for restoration. The Webb Lecture, Washington DC.

Sarno, D. J., D. L. Keyes. 2002 June 30. Best practices for effective public involvement in restricted-use decommissioning of NRC-licensed facilities. U.S. Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Decommissioning Branch, Rockville, MD.

Schneider, M., P. Teske, M. Marschall, M. Mintrom, and C. Roch. 1997. Institutional arrangements and the creation of social capital: the effects of public school choice. American Political Science Review 91:82-93.

Sinclair, J. and A. Diduck. 1995. Public education: an undervalued component of the environmental assessment public involvement process. Environmental Impact Assessment Review 15:219-240.

Stewart, R. B. 1975. The reformation of American Administrative Law. Harvard Law Review 18:1667-1813.

Susskind, L. and J. Cruikshank. 1987. Breaking the impasse. Basic Books, Inc., New York.

Toker, C. W. 2004. Public participation or stakeholder frustration: an analysis of consensus-based participation in the Georgia Ports Authority's Stakeholder Evaluation Group. *In* Communication and public participation in environmental decision making. S. P. Depoe, J. W. Delicath, and M. F. A. Elsenbeer, eds. 2004. SUNY Press, Albany, New York.

Tuler, S. and T. Webler. 1999. Voices from the forest: what participants expect of a public participation process. Society & Natural Resources 12:437-453.

U.S. Census Bureau. 1995. Georgia: Population of Counties by Decennial Census: 1900 to 1990. Population Division, U.S. Census Bureau, Washington, DC. http://www.census.gov/population/cencounts/ga190090.txt

_____. 2005. Table A1: Interim projections of the total population for the United States and States: April 1, 2000 to July 1, 2030. Population Division, U.S. Census Bureau, Washington, DC. http://www.census.gov/population/projections/SummaryTabA1.pdf

_____. 2006. State and county quick facts: Georgia. U.S. Census Bureau, Washington DC. http://quickfacts.census.gov/qfd/states/13000.html

U.S. EPA. 1997. Top 10 watershed lessons learned. U.S. EPA, Washington, DC. http://www.epa.gov/owow/lessons

_____. 2002. National Water Quality Inventory 2000 Report. U.S. EPA, Washington, DC. http://www.epa.gov/305b/2000report

Verba, S., K. L. Schlozman, and H. E. Brady. 1995. Voice and equality: civic volunteerism in American politics. Harvard University Press, Cambridge and London.

Waller, D. 2005. Georgia Wildlife Federation Camouflage Coalition radio sound bytes, Covington, GA.

Wang, D. Engaging citizens in environmental decision making: Burlington, Vermont's EMPACT Project. Journal of Urban Technology 9:95-109.

Webster's Third New International Dictionary, Unabridged. 1966. G & C Merriam Co., Springfield, MA.

Wenger, S. J. and L. Fowler. 2000. Protecting stream and river corridors: creating effective local riparian buffer ordinances. Carl Vinson Institute of Government, University of Georgia, Athens, GA.

Williams, B. A. and A. R. Matheny. 1995. Democracy, dialogue, and environmental disputes. Yale University Press, New Haven and London.

Wong, A., L. Owens-Viani, A. Steding, P. H. Gleick, D. Haasz, R. Wilkinson, M. Fidell, and S. Gomez. 1999. Sustainable use of water: California success stories. Pacific Institute for Studies in Development, Environment, and Security, Oakland, CA.

World Almanac for Kids Online. 2003. Georgia. World Almanac Education Group Inc., New York, NY. http://www.worldalmanacforkids.com/explore/states/georgia.html

APPENDIX

APPENDIX A

Questionnaire

Name: _____ **Title:** _____

Organization, Association, or Business Name: _____

Please answer the following questions. If you need more space, please use the back or attach a separate sheet. Thank you!

1. What is your organization's/association's/business' most important water concern?

2. Are you or any member of your organization/association/business planning to participate in the development of the Comprehensive Statewide Water Management Plan? Please explain.

3. Are you or any member of your organization/association/business serving on an advisory committee established by Georgia EPD? ___ *Yes* ___ *No*

If so, which one?

___ *Statewide Advisory Committee*

___ *Technical Advisory Committee;* *Which TAC?* _____

___ *Basin Advisory Committee;* *Which BAC?* _____

4. What information would you like to see in an online guide about Georgia's Comprehensive Statewide Water Management Plan? On a scale of 1-5, with 5 being most important, please state the importance of the following.

___ *Description of issues that will be addressed by the statewide water plan*

___ *Description of Georgia EPD's planning process and framework*

___ *Description of opportunities for public involvement*

___ *Glossary of terms*

5. Please state any additional items you would find helpful in this online guide.

6. Would your organization/association/business be willing to put a link to this online guide on your website?

APPENDIX B

Participation Guides

1	Citizen Involvement Committee. 1999. Citizen Involvement Handbook. Multnomah County, OR. www.co.multnomah.or.us/orgs/cic/cic_hb.pdf
2	Georgia Center for Law in the Public Interest. A Citizen's Guide to Fighting Water Pollution in Georgia. Atlanta, GA. www.cleangeorgia.org/net/content/item.aspx?s=19305.0.101.19069
3	Georgia River Network. Citizens Dam Prevention Manual. Athens, GA. www.garivers.org/Concepts.htm
4	Informed Citizens Involvement Campaign. Rural Guide to Informed Citizen Involvement. Idaho. www.informedcitizeninvolvement.org/ICICGuide.pdf
5	Jefferson County Planning and Zoning Department. 2002. Water Smarts: A Homeowner's Guide to Mountain Ground Water. Jefferson County, CO. www.co.jefferson.co.us/planning/planning_T59_R36.htm
6	Jefferson County Planning and Zoning Department. 2006. Planning and Zoning Processes: A Citizen's Handbook. Jefferson County, CO. www.co.jefferson.co.us/planning/planning_T59_R95.htm
7	South Branch Watershed Association. 2003. Citizen's Guide. NJ. www.sbwa.org/CitizensGuide.html
8	Upper Chattahoochee Riverkeeper and Georgia Center for Law in the Public Interest. 2005. Get the Dirt Out. Atlanta, GA. www.getthedirtout.org

Issues Guides

1	Friends of the River. 2000. Rivers of Power: A Citizen's Guide to Hydropower and River Restoration. Sacramento, CA. www.friendsoftheriver.org/Publications/PDF/RversOfPower.pdf
2	The Gallatin Watershed Sourcebook: A Resident's Guide. Gallatin Valley, MT. www.mt.nrcs.usda.gov/technical/ecs/watersheds/galsourcebook/
3	University of Colorado's Natural Resources Law Center: Innovations in Forestry: Funding Forest Plans. To order: www.colorado.edu/Law/centers/nrlc/publications/purchase/research.htm
4	University of Colorado's Natural Resources Law Center: "Innovations in Forestry: Public participation in forest planning." To order: www.colorado.edu/Law/centers/nrlc/publications/purchase/research.htm
5	University of Colorado's Natural Resources Law Center: "Innovations in Forestry: Stewardship." To order: www.colorado.edu/Law/centers/nrlc/publications/purchase/research.htm
6	Water Education Foundation. 2000. Layperson's Guide to Environmental Restoration. For purchase: www.water-ed.org/store/default.asp
7	Water Education Foundation. 2003. Layperson's Guide to Drinking Water. For purchase: www.water-ed.org/store/default.asp
8	Water Education Foundation. 2003. Layperson's Guide to Groundwater. For purchase: www.water-ed.org/store/default.asp
9	Water Education Foundation. 2004. Layperson's Guide to The State Water Project. For purchase: www.water-ed.org/store/default.asp
10	Water Education Foundation. 2004. Layperson's Guide to Water Conservation. For purchase: www.water-ed.org/store/default.asp
11	Water Education Foundation. 2004. The Water Awareness Guide: Where Your Water Comes From. For purchase: www.water-ed.org/store/default.asp
12	Water Education Foundation. 2005. Layperson's Guide to Water Rights Law. For purchase: www.water-ed.org/store/default.asp

APPENDIX C

Site Map

Home

Water Planning Process

- Need for Water Plan
- EPD's Planning Process
  - Georgia Water Council
  - Management Objectives
  - Planning Timeframe
- EPD's Public Involvement Process
  - State Advisory Committee
  - Basin Advisory Committees
    - BAC Map
  - Technical Advisory Committees
  - Meeting Schedule
- Meeting Schedule
- Comprehensive Statewide Water Management Planning Act
  - Summary
  - Bill

Management Objectives

- Minimizing Withdrawals
  - Nine Water Conservation Goals
  - Agricultural Irrigation Water Users
  - Golf Course Water Users
  - Industrial Water Users and Power Providers
  - Public and Private Water Providers
- Maximizing Returns
  - Interbasin Transfers
    - Metropolitan North Georgia Water Planning District
  - Septic Systems
  - Land Application Systems
    - Illustration of a Land Application System
    - List of LAS of at least 1 million gallons per day
    - Map of LAS Sites in Georgia
- Meeting Instream/Offstream Needs
- Protecting Water Quality

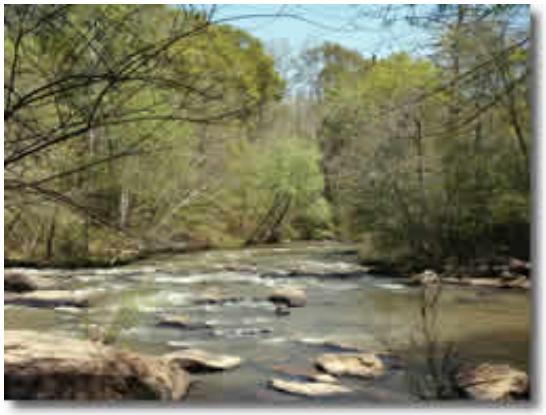
Citizen Action Plan

- Personal Action Plan for Getting Involved
  - Sample Personal Action Plan
- Strength in Numbers: Joining an Organized Effort
  - Georgia Water Coalition
  - Sample Action Plan for Organizations
- Tips and Tools for Public Participation
  - Press Release Content Basics
  - 10 Essential Tips to Writing Press Releases
  - Press Release Template
  - Tips for Writing Letters to the Editor *(PDF download)*
  - 20/20 Vision's Tools for Citizens
  - League of Women Voter's Tips for Contacting and Talking with Public Officials *(PDF download)*
- Contact Information
- Meeting Schedule

Resources

- Links
- Feedback
- Acknowledgements

Glossary



a citizen's guide to Statewide Water Planning in Georgia

- *Did you know that what goes into our rivers comes out in **your drinking water**?*
- *Do you think it's important to have **enough clean water** for the future of our children?*
- *Do you believe that our government leaders should be **held accountable** for protecting our waterways?*

If you answer YES, then you need to provide your input into Georgia's Statewide Water Planning Process.

The Online Citizen's Guide is a resource to help citizens participate more effectively in Georgia's Statewide Water Planning Process. The Georgia Environmental Protection Division has designed an unprecedented process for public involvement so that you can have a voice. With your help and participation, we can ensure that the Comprehensive Statewide Water Management Plan represents the priorities of all Georgians.

The Georgia EPD has the official Statewide Water Planning Website. The information here is similar to the reports on the official site, but in a summarized format that is easier to understand.

Water Management Objectives

- Minimizing water withdrawals
- Maximizing water returns to river basins
- Meeting instream and offstream needs
- Protecting water quality

Number of Visitors:

Need for a Comprehensive Statewide Water Management Plan

Georgia began building its water management program in the late 1960s and early 1970s, when Georgia's population was approximately 4.5 million. During this time, there was very little mechanical agricultural irrigation, much less impervious cover, plentiful supplies of potable water, limited municipal wastewater treatment, and little historical monitoring of water quality and quantity. The population of Georgia was estimated at 8.8 million in 2004, and it's projected to be 12 million in 2030. Because Georgia has changed so much, we need to examine our water management program and update our current management policies to ensure abundant supplies of clean water.

There are a variety of reasons that underscore the need for a Comprehensive Statewide Water Management Plan in Georgia.

Geology and Hydrology

Georgia is comprised of five physiological provinces, which vary in bedrock, soil, and topography. This results in an uneven distribution of water resources. Based on its water resources and issues, Georgia can be separated into two distinct regions – North Georgia and South Georgia.

North Georgia is characterized by greater dependence on surface water. There is very little groundwater and limited surface water available because of the small streams that originate in this region and there is limited natural storage of water because the natural barriers that would impede flow have eroded away. There are no natural lakes, and damming smaller streams to form reservoirs continues as a water supply means. North Georgia is the major urban and industrial area of the state, which creates a high demand for water.

South Georgia, by contrast, has larger rivers and extensive aquifers. The aquifers are artesian, which means when large quantities of groundwater are withdrawn in one location, problems can arise in other locations due to the decline in water levels or from saltwater drawn in to the pumping zone. South Georgia faces the problem of the lack of freshwater from rivers reaching the coastal estuaries, which are breeding, nursing, and feeding grounds for many aquatic species. This region also supports the $21 million commercial fishing industry on the coast of Georgia.

Map: River Basins, Groundwater Regions, and Metropolitan Statistical Areas in Georgia

Source: Kundell, J. E. and D. Tetens. 1998. Whose water is it? Major water allocation issues facing Georgia.

Weather and Climate

Weather and climate are factors that must be considered when developing a water management plan for Georgia. Georgia is a humid and wet state with an average rainfall of 50 inches per year, ranking fifth in the United States. However, floods and droughts have affected water resources and their use.

In the past two decades, Georgia has experienced two of the worst droughts on record, a 100-year flood, and a 500-year flood. The drought of 1998-2001 had a profound impact on the state's municipal and agricultural water systems. During the summer of 2000, 23 cities and five counties faced critical shortages, and the U.S. Department of Agriculture declared all 159 counties in Georgia disaster areas due to drought. Drought and flood planning are critical components of comprehensive planning to reduce the impacts and minimize the need for emergency relief.

Population Growth

The increase in population growth in Georgia has contributed to stress on the state's water resources. According to the Census, From 1990 to 2000, the population in Georgia increased 26.4%, compared to the national increase of 13.1%. The population is projected to approach 12 million in the next 25 years.

Another problem is the location of the population growth. The two fastest growing areas are the Atlanta metropolitan area, which has limited water resources, and the Georgia coast, which is facing saltwater intrusion problems in its major groundwater source, the Floridan Aquifer.

Neighboring States

Neighboring states play a role in the need for a statewide water management plan, because many of Georgia's water resources are shared with other states. All but three of Georgia's fourteen major river basins are shared with neighboring states. Additionally, the Floridan Aquifer, Georgia's major groundwater resource, is shared with Florida, Alabama, and South Carolina.

The interstate concern over water use in the Apalachicola-Chattahoochee-Flint (ACF) River Basins between Florida, Alabama, and Georgia, and in the Alabama-Coosa-Tallapoosa (ACT) River Basins between Alabama and Georgia sparked a dispute, or "Water War," in 1990 with a lawsuit between Georgia, Alabama, and Florida regarding the apportioning of water in these two basin systems. These disputes remain unresolved today. Both of these river basin systems originate in North Georgia and supply water to the Atlanta metropolitan area. These systems are critically important to Georgia because they comprise 38% of the state's total land area, provide drinking water to 60% of the population, and supply water to more than 35% of the irrigated agriculture in Georgia (BNR White Paper 2001). On other borders, Tennessee and South Carolina have also expressed concern over shared water resources.

Federal Courts

Without the foundation of a comprehensive water management plan, many decisions about water management are being decided in court, which is time-consuming and costly. The state has been involved in litigation over groundwater use in coastal Georgia, interstate apportionment, and water quality protection.

Knowledge

It is critical that Georgia's current water management program is examined in light of recent scientific and technological findings. Scientific research has provided greater knowledge about the functions of water resources and the need for healthy aquatic systems. New information is being communicated to the public through educational and training programs, the media, and the Internet.

Technology

Improved knowledge has led to advances in technology, such as how water users can obtain, transport, treat, use, and conserve water. An example of improved technology is the use of variable-rate irrigation (VRI) systems. The center pivot is commonly used for irrigation in Georgia. However, farmers have little control over the amount of water the nozzles spray and the location of the spray. VRI technology allows farmers to apply water when and where it is needed by using computer maps, sensors, and software to control the location and the amount of water sprayed on crops. Scientists from the University of Georgia have tested the water efficiency of VRI systems on three fields in Georgia. By allowing the farmers to water their crops with the correct amount for optimal yield, their water use was reduced by 8%-20% in each year. Considering there are approximately 10,000 center pivots in Georgia, VRI technology could help decrease the demand for water for irrigation and improve crop productivity in South Georgia (NRCS 2005).

Value of Water

With the growing demand for water in the state, the value of water has increased. Cities and counties need clean water for drinking water supply and to attract economic opportunities. Industrial and agricultural production depends on water. Power companies generate energy from peak flows of water through dams. All living organisms require water for survival. Water resources provide habitat, nurseries, and refuge for plants and animals – both aquatic and terrestrial. Water provides social, cultural, and aesthetic values.

Recreational activities rely on an abundant supply of clean water.

For example, water is critical to the hunting and fishing industries of the state. According to the Georgia Wildlife Federation, there are approximately 417,000 hunters and 1.2 million anglers in Georgia who spend over $1 billion annually on direct expenditures, including equipment, food, lodging, and transportation. The hunting and fishing industries provide 10,000 jobs in the state. The key to comprehensive water planning is to balance these many demands for water.

Georgia EPD Statewide Water Planning

Georgia EPD's Water Planning Process

The Georgia General Assembly passed the Comprehensive Statewide Water Management Planning Act, O.C.G.A. § 12-5-520 to 525. This Act charges Georgia EPD to develop the plan with the assistance of the newly formed Georgia Water Council and an extensive public involvement process. The proposed plan will be presented to the Water Council for review, modification, and final approval before July 1, 2007. The Water Council will deliver the final statewide water plan to the 2008 General Assembly to be considered for adoption though a Joint Resolution.

The Act mandates the development of a plan that **supports the following vision**: "Georgia manages water resources in a sustainable manner to support the state's economy, to protect public health and natural systems, and to enhance the quality of life for all citizens" (O.C.G.A. § 12-5-522(a)).

Two overarching goals will guide the development of the plan:

- Meeting future water needs while protecting aquifers, instream uses, and downstream users
- Meeting public health and environmental needs

The water plan is organized around **four water management objectives**:

- Minimizing water withdrawals
- Maximizing water returns to river basins
- Meeting instream and offstream needs
- Protecting water quality

Two major scopes of activity and content will eventually comprise the Comprehensive Statewide Water Management Plan – a state component and a sub-state component. The state component will accomplish several objectives. First, it will evaluate trends and conditions to determine the challenges faced now and in the future. Second, it will evaluate current statutes, rules, programs, and policies to address the challenges. Third, it will identify gaps and weaknesses in the current structure. Finally, it will identify options for addressing gaps and weaknesses and weigh the benefits and drawbacks of each option.

The sub-state component will not by covered as extensively in this first iteration of the Water Plan. EPD and the Water Council will develop a sub-state planning framework and guiding principles.

- Tasks and Milestones in Planning Timeframe

Policy Toolbox

A variety of policies will be used to develop the Comprehensive Statewide Water Management Plan. Some policies used will be those that are currently available to us, such as:

- Clean Water Act
- Georgia Water Quality Control Act
- Georgia Erosion and Sedimentation Act
- Groundwater Use Act
- Interim Instream Flow Policy

Others policies will be **new**, such as:

- Water Conservation, Reuse & Efficiency
- Interbasin Transfers Management
- Septic Systems Management
- Land Application Systems Management
- Stream Flows
- Reservoirs
- Aquifer Storage and Recovery
- Stormwater Management

While this first installment of the planning process will address many water concerns throughout the state, it will not address several key concerns, such as water allocation.
Also, this first version will include only guidelines for a framework for sub-state, or regional, planning. The next installment will likely include policies that are not in this first version.

Georgia Water Council

The Comprehensive Statewide Water Management Planning Act establishes the 14-member Water Council, consisting of eight agency heads, four non-voting legislators, and two at-large members appointed by the Speaker of the House and the Senate President Pro Tempore. The Water Council will oversee the planning process, provide input to EPD throughout the development of the plan, and make the final decisions before submitting the water plan to the 2008 General Assembly. The Statewide Water Plan will be presented to the Water Council for review, modification, and final approval before July 1, 2007. The Water Council will deliver the final version of the Water Plan to the 2008 General Assembly to be considered for adoption through a Joint Resolution.

Water Council Members

Dr. Carol Couch (chair), Director	Georgia Environmental Protection Division
Mike Beatty, Commissioner	Georgia Department of Community Affairs
Gus Bell, Member At-Large	Savannah, GA
David Bennett, Executive Director	GA Soil and Water Conservation Commission
Senator John Bulloch	District 11, Ochlocknee, GA
Paul Burks, Executive Director	Georgia Environmental Facilities Authority
Noel Holcomb, Commissioner	Georgia Department of Natural Resources
Tommy Irvin, Commissioner	Georgia Department of Agriculture
Jerry Lane, Member At-Large	Claxton, GA
Representative Tom McCall	District 30, Elberton, GA
Representative Lynn Smith	District 70, Newnan, GA
Kenneth Stewart Jr., Director	Georgia Forestry Commission
Senator Ross Tolleson	District 20, Perry, GA
B.J. Walker, Commissioner	Georgia Department of Human Resources

Planning Timeframe

Key Dates:

- July 2006: First Round of Town Hall Meetings
  (specific dates and locations will be posted on Meeting Schedule as announced)
- January 2007: Second Round of Town Hall Meetings
- July 1, 2007: Water Plan is due to the Water Council
- First Day of 2008 General Assembly Session: Water Council is to submit Water Plan to General Assembly through a Joint Resolution

Three Phases of Plan Development:

Phase 1: Identify and describe policy issues, a range of options, and their implications

- Much of this work will be conducted by EPD. UGA's Carl Vinson Institute of Government will provide background information on different policies and management strategies. The Attorney General's office will provide guidance on current state laws and policies.

Phase 2: Implement a definitive and comprehensive stakeholder input strategy

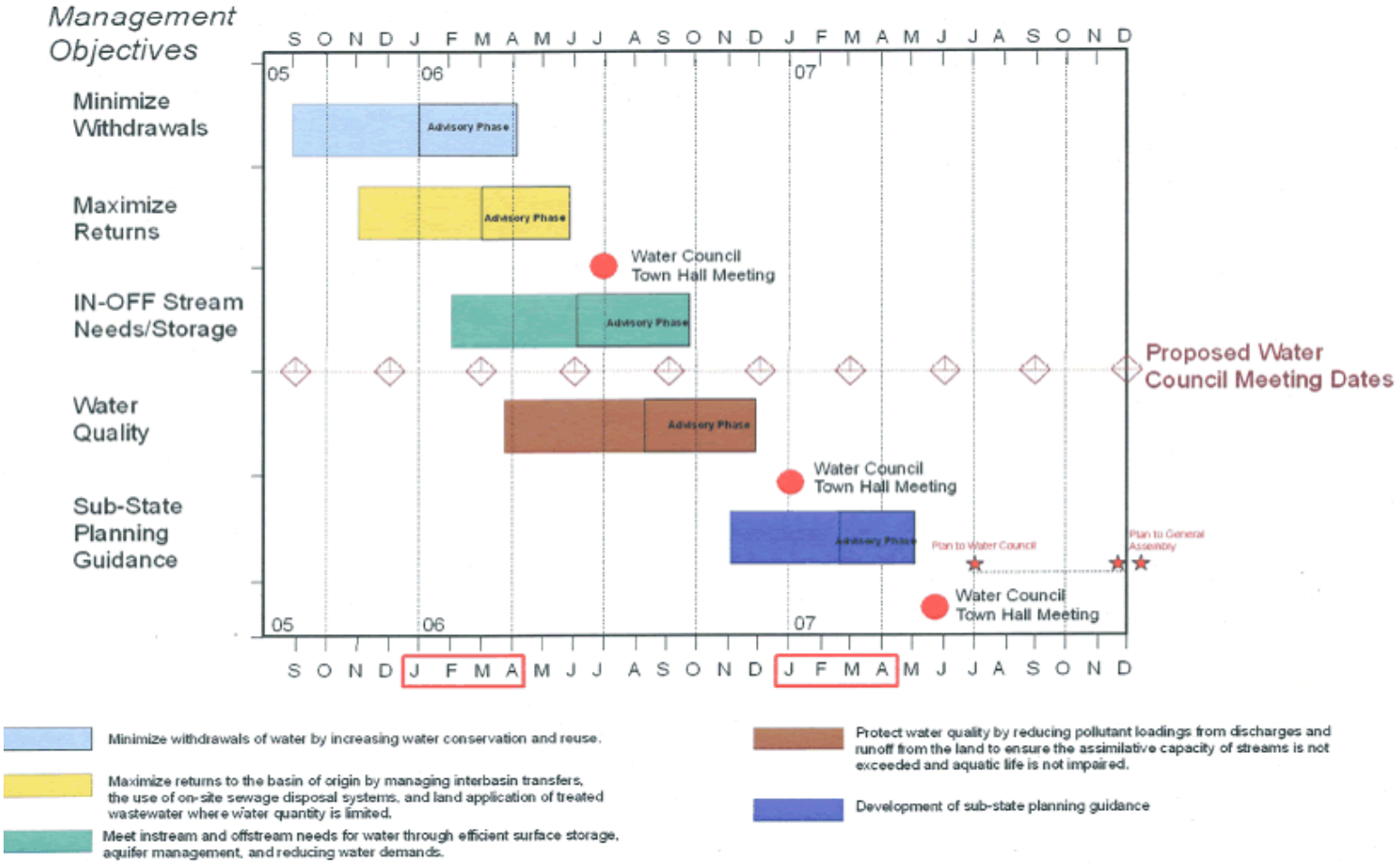
- This phase will determine the stakeholder process.

Phase 3: Develop recommendations and a draft State Water Plan

- Stakeholder input will be used to draft policy recommendations. EPD and the Water Council will complete the draft plan.

The following chart shows EPD's tasks and milestones for developing the statewide water plan:

Development of the GA Comprehensive Statewide Water Management Plan - Tasks & Milestones -

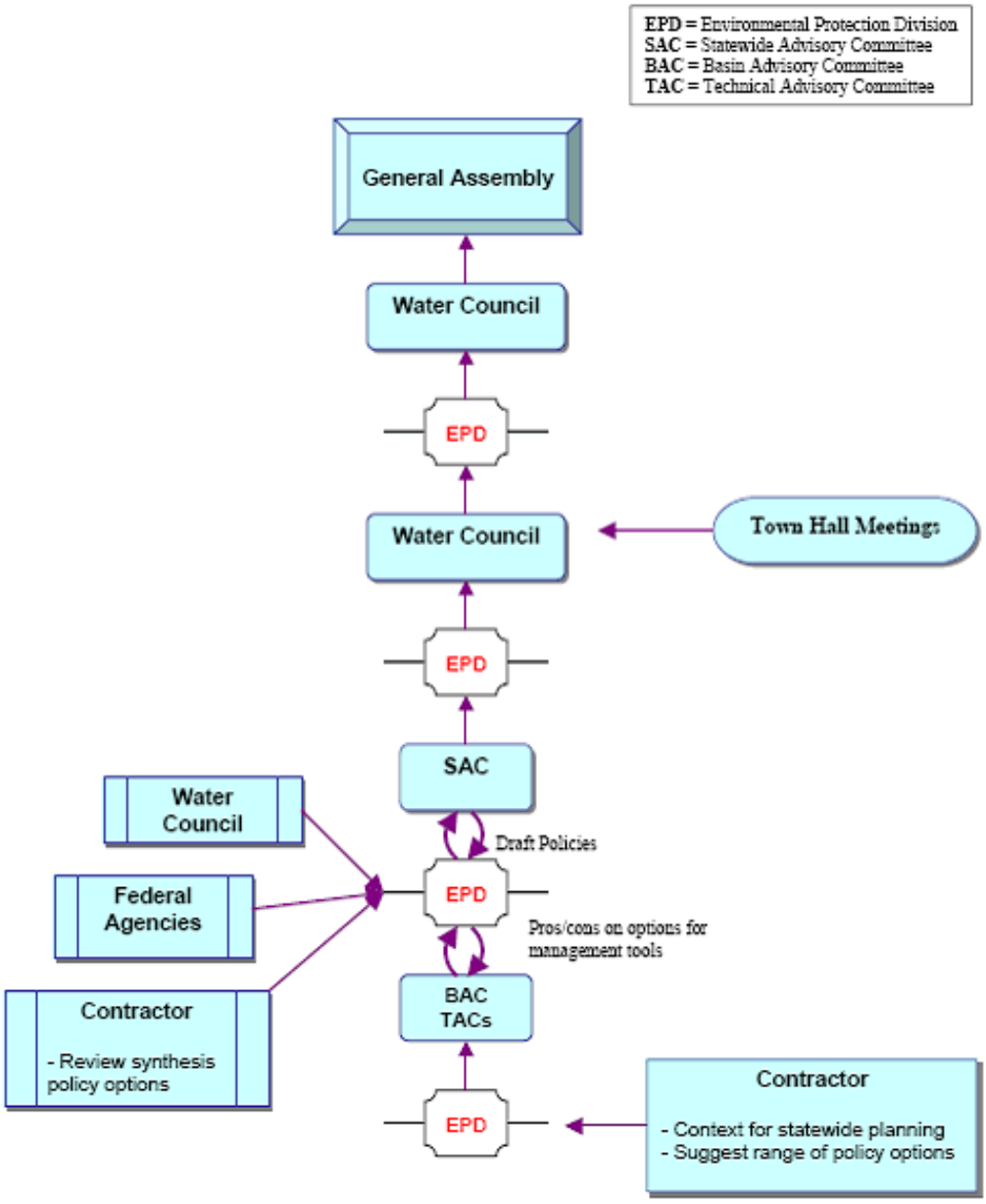


Reference: EPD, 2005

EPD's Public Involvement Process

The public involvement process designed by Georgia EPD is one of the largest ever undertaken by a state agency in Georgia. If well coordinated, the public involvement process has the potential not only to improve the quality of decision making in the planning process, but also to help EPD develop a plan that will be supported by a broad spectrum of Georgia citizens.

Georgia EPD's public involvement process involves over 250 individuals, serving on three types of advisory committees – a Statewide Advisory Committee, Basin Advisory Committees, and Technical Advisory Committees. EPD requested nominations for individuals to serve on these committees and made their selections at the end of 2005. Committee members do not have decision-making authority and receive no financial compensation for their involvement. Their purpose is to receive information provided by EPD and offer input and advice to EPD on a range of management objectives and policy tools.



Reference: EPD, 2005

Advisory Committees

- Statewide Advisory Committee
- Basin Advisory Committees
- Technical Advisory Committees

Town Hall Meetings

In addition to the advisory committees, EPD and the Water Council will host a series of town hall meetings. These meetings will provide concerned citizens with the opportunity to provide input. More information will be posted about the town hall meetings when it becomes available from EPD.

First Round of Town Hall Meetings: Summer 2006

- Review first 2 Management Objectives:
  - Minimizing Water Withdrawals
  - Maximizing Returns to River Basins

Second Round of Town Hall Meetings: Winter 2007

- Review last 2 Management Objectives:
  - Meeting Instream and Offstream Needs
  - Protecting Water Quality

Statewide Advisory Committee

The Statewide Advisory Committee (SAC) consists of 32 representatives from organizations with statewide constituencies. The SAC is responsible for providing EPD with a statewide perspective and input on the overarching management goals, objectives, and new policy tools. The SAC will review EPD's policy toolbox and sub-state planning framework before these recommendations are formally submitted to the Water Council.

John Cardosa, Executive Director	Georgia Crushed Stone Association
Terry Christie, Chairman	Georgia Association of Regional Development Centers
Berry Collett	Georgia State Golf Association
Jerry Cook, Environmental Manager	Chemical Products Corp., Georgia Industry Association
Brad Curry	Member At Large
Glenn Dowling, Executive Vice President	Georgia Wildlife Federation
Jack Dozier, Executive Director	Georgia Association of Water Professionals
Tom Gehl, Government Affairs	Georgia Municipal Association
Jamie Higgins	Georgia Canoeing Association
Charles Hood, Georgia Pacific	Georgia Pulp & Paper
Hunter Hopkins, V.P. Government Affairs	Georgia Chamber of Commerce
Jon Huffmaster, Dir. Legislative Dept.	Georgia Farm Bureau Federation
Charles Huling, V.P. of Gov. Affairs	Georgia Power
Andy Hull	Georgia Green Industry Association
April Ingle, Executive Director	Georgia River Network
Ross King, Deputy Director	Association County Commissioners of Georgia
David Kubala	Georgia Rural Water Association
Cullen Larson, CEcD, Executive Director	Georgia Economic Developers Association
Lee Lemke, Executive Vice President	Georgia Mining Association
Charles Manning, Senior Vice President	Municipal Electric Authority of Georgia
Jim McClatchey, Board Member	Georgia Industry Environmental Coalition
Tavia McCuean, State Director	The Nature Conservancy
Steve McWilliams, Executive Director	Georgia Forestry Association
Aaron McWhorter	Georgia Turfgrass Association
Reggie Prime, Environmental Affairs	Coca-Cola Enterprises, Georgia Beverage Association
Donnie Smith	Member At Large

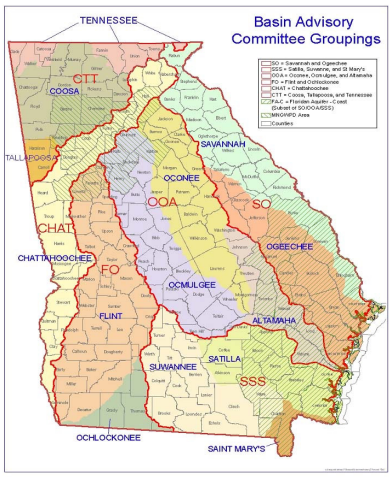
Pat Stevens	Member At Large
Jim Stokes, President	Georgia Conservancy
Lindsay Thomas	Member At Large
Bryan Tolar, V.P. of Public Affairs	Georgia Agribusiness Council
Tim Williams	Home Builders Association of Georgia
Denise Wood	Georgia Textile Manufacturing Association

Basin Advisory Committees

There are eight Basin Advisory Committees (BACs), representing six river basin regions, the coastal aquifers, and the Atlanta metropolitan area. The BACs are composed of 187 members from the following interest groups: academic, agricultural, conservation, existing regional water organizations, industrial, instream users, municipal and county, recreational, regional development centers, upstream and downstream users. Their primary purpose is to provide regional perspectives and input on water management objectives and new policy tools.

Savannah – Ogeechee Basin Advisory Committee
Satilla – Suwanee – St. Mary's Basin Advisory Committee
Oconee– Ocmulgee – Altamaha Basin Advisory Committee
Flint – Ochlockonee Basin Advisory Committee
ChattahoocheeBasin Advisory Committee
Coosa – Tallapoosa – Tennessee Basin Advisory Committee
Metro Overlay Basin Advisory Committee

Map of Basin Regions
(click for larger view)



Savannah – Ogeechee Basin Advisory Committee

Mr. James P. Alfriend	Landowner and Forestry Consultant	Thomson
Mayor Dwain Biggerstaff	GA Association of RDC's	Lincolnton
Mr. Braye Boardman	Beacon Blue LLC	Augusta
Mr. Joe Boddiford	Cotton & Peanut Farmer	Sylvania
Ms. Chandra Brown	Ogeechee Canochee Riverkeeper	Statesboro

Mr. Dennis Brown	GSWCC Commission Member	Commerce
Mr. Frank Carl	Savannah Riverkeeper	Augusta
Mr. Williams C. Clayton	Columbia County Water	Martinez
Mr. Mack Duncan	J.M. Huber Corporation	Wrens
Ms. Mary Elfner	Mary Elfner Environmental Consulting	Savannah
Mr. Mike Eskew	City of Washington	Washington
Mr. Gary Fesperman	City of Lavonia	Lavonia
Mr. Larry Haley		Hartwell
Ms. Jackie Jackson		Savannah
Mr. W. Phillip Jones	Bryan County	Pembroke
Mr. Craig Lanier	Farmer & Cotton Gin	Metter
Mr. Chris McCorkle	Horticulture Production	Dearing
Ms. Patty McIntosh	Georgia Conservancy	Savannah
Mr. Kline Petty	Georgia Power	Evans
Mr. Pat Reddish	Forest Products Company	Riceboro
Mr. Robert Sackellares	Georgia Pacific	Atlanta
Mr. Bob Scanlon	City of Savannah	Savannah
Mr. Lamar Smith	Southprop Development	Reidsville
Mr. Mark Smith	South Atlantic Utilitites	Savannah
Ms. Jan Tankersley	Bulloch County	Statesboro
Mayor Wayne Tipton	City of Bloomingdale	Bloomingdale
Ms. Amanda Wrona	The Nature Conservancy	Savannah

Satilla – Suwanee – St. Mary's Basin Advisory Committee

Ms. Myrna Ballard	Valdosta-Lowndes County Chamber of Commerce	Valdosta
Mr. Dan Coty	Georgia Association of RDC's	Brunswick
Mr. Davin Eason	Farmer & Cotton Gin Owner	Lenox
Mr. Greg C. Evans	Statewide Engineering, Inc.	Douglas
Mr. William Francis	City of Waycross	Brunswick
Mayor John Fretti	City of Valdosta	Valdosta
Mr. Jim Gilbert	General Counsel – Sea Island	Sea Island
Mr. Bill Jernigan	Georgia Pacific Corporation	Atlanta
Mr. David Kyler	Center of a Sustainable Coast	St. Simons Island
Commissioner Richard Lee	Lowndes County	Valdosta
Mr. Paul Loupee	Island Specialties	St. Simons Island
Ms. Emily Perry-Davenport		Valdosta
Mr. O.C. Prince		Lake Park
Mr. Jim Renner	Golder Associates	Atlanta
Mr. Gordon Rogers	Satilla Riverkeeper	Waynesville
Mr. John Strickland	Clinch County Board of Commissioners	Homerville
Mr. Grady Thompson	Tift County Board of Commissioners	Tifton
Mr. William F. Varn	Landowner and Forestry Products Company	Hoboken
Mr. Andres Villegas	Langdate Industries	Valdosta

Mr. Gary Walker		

Oconee – Ocmulgee – Altamaha Basin Advisory Committee

Mr. Spencer Black	Triangle Chemical	Macon
Mr. Mark Brock	Brock Design Group	Suwanee
Mr. Jerry Davis	Cotton Gin	Hawkinsville
Mr. Melvin Davis	Oconee County Commission	Watkinsville
Mr. Gerald A. Dewitt	Rayonier	Jesup
Mr. Larry Eley		White Plains
Dr. L.C. Evans	Landowner	Cochran
Mr. Jonathan Green	Gold Kist	Atlanta
Mr. Ted Griffin	A.A.A. Construction	
Mr. Wade Hall	Landowner	Eastman
Ms. Carol Hassell	Georgia Wildlife Federation	Covington
Mr. Dan Hays	GSWCC Commission Member	Covington
Mr. Scott Hendricks	Georgia Power Land Resources	Atlanta
Mr. Rick Jeffares	City Manager of Locust Grove	Locust Grove
Mr. Larry Kaiser	Public Service and Engineering	Conyers
Ms. Christi Lambert	The Nature Conservancy, Georgia Chapter	Darien
Mr. Tom Lehman	Engelhard Corporation	Gordon
Mr. Randall Morris	Row Crop Farmer	Uvalda
Mr. Robert Phillips	Georgia Bass Federation	Covington
Mr. Alan Reddish	City Manager	Athens
Mr. Ted Rhinehart	DeKalb County – Public Works	Decatur
Mr. Bryan Rodgers	Laurens County	Dublin
Ms. Christine Rodick	UGA River Basin Center	Athens
Mr. Tony Rojas	Macon Water Authority	Macon
Ms. Deborah Sheppard	Altamaha Riverkeeper	Darien
Mr. Ronnie Stapp	Pennington Seed	Madison
Ms. Jessica Sterling	Upper Oconee Watershed Network	Athens
Mayor Billy Trapnell	City of Metter	Metter
Mr. Frank Turner	Newton Land Trust	Covington
Mayor Ken Turner	City of Gordon	Gordon
Ms. Susan Varlamoff	UGA Agricultural & Environmental Sciences	Athens

Flint – Ochlockonee Basin Advisory Committee

Mr. Paul Ahnberg	Engelhard Corporation	Attapulgus
Mr. Wade Brannan	Clayton County Water Authority	Morrow
Mr. David Burke	Oil Drill Corporation	Ochlocknee
Mr. Dennis L. Carey	Timber Harvesting Firm	Montezuma
Mr. Ronnie Dudley	Stevenson & Palmer	Albany
Mr. Rick Eastin	City of Fayetteville, Department of Water and Sewer	Fayetteville

Mr. Tommy Greggors	Georgia Wildlife Federation	Leesburg
Mr. Hal Haddock	Flint River Regional Water Council, Inc.	Albany
Mr. Chris Hobby	City of Bainbridge	Bainbridge
Mr. Malcom Hodges	The Nature Conservancy, GA Chapter	Atlanta
Mr. Terrell Hudson	Cotton, Peanut, and Watermelon Grower	Unadilla
Mr. John (Bubba) Johnson		Camilla
Mr. Raines Jordan	Land Owner	Talbutton
Mr. Brant Keller	Public Utilities Manager	Griffin
Mr. Harvey Lemmon	Beef Industry Farmer	Woodbury
Ms. Rebecca Martin	Development Authority Bainbridge	Bainbridge
Mr. George McIntosh	Highland Land Company	Albany
Mr. Mike Newbury	Cotton and Peanut Grower	Arlington
Mr. Russ Ober		Leesburg
Ms. Janet Sheldon	Georgia Conservancy	Moultrie
Mr. Charles Simmons	Randolph County Board of Commissioners	Cuthbert
Mr. Steve Singletary	GSWCC Commission Member	Blakely
Mr. Ronnie Walston	Georgia Power	Albany
Mr. Dave Wills	Webster County Board of Commissioners	Preston

Chattahoochee Basin Advisory Committee

Ms. Alex Adams	Upper Chattahoochee Riverkeeper	Atlanta
Mr. Gerald Anderson	Clay County Commissioners	Fort Gaines
Mr. Ralph Balkcom		Georgetown
Mr. Joe Burns	Landscape Industry	Grayson
Mr. Jim Butterworth	Habersham County	Clarkesville
Mr. Cliff Chamblee	GP Cedartown	Cedar Springs
Mr. Sam Chapman		Talmo
Mr. Jack Conway	Forsyth County Board of Commissioners	Cumming
Mr. William Evans	Georgia Power Company	Atlanta
Mr. Jim Forbes	Lafarge Aggregates	Lithonia
Mr. Roy Fowler	Cobb-Marietta Water Authority	Marietta
Mr. Peter Frost	Douglas County WSA	Douglas
Mr. Theron Gay	Coweta County	Newnan
Mr. Harry Hall	Georgia Bass Federation	Midland
Mr. Kent Iglehart	Roswell City Councilman	Atlanta
Ms. Jackie Joseph	Lake Lanier Association	Gainesville
Mr. Mike Kilgallon	Pacific 3, LLC	Atlanta
Mr. Rob Kindrick	Land Business	Pine Mountain
Mr. Bill Lewis	City of Dahlonega	Dahlonega
Mr. Joe Maltese	City of LaGrange	LaGrange
Ms. Dorothy McDaniel	Georgia Conservancy	Columbus
Ms. Clair Muller	City of Atlanta	Atlanta
Mr. Joe Padilla		Woodstock

Mr. Denney Rogers	Farm Input Sales	Franklin
Mr. Bryan Shuler	City of Gainesville	Gainesville
Mr. Terry Snell	William L. Bonnell Company	Newnan
Mr. Dick Timmerberg	West Point Lake Coalition	LaGrange
Mr. Billy Turner	Columbus Water Works	Columbus
Mr. George Williams	Chattahoochee Riverkeeper	Columbus

Coosa – Tallapoosa – Tennessee Basin Advisory Committee

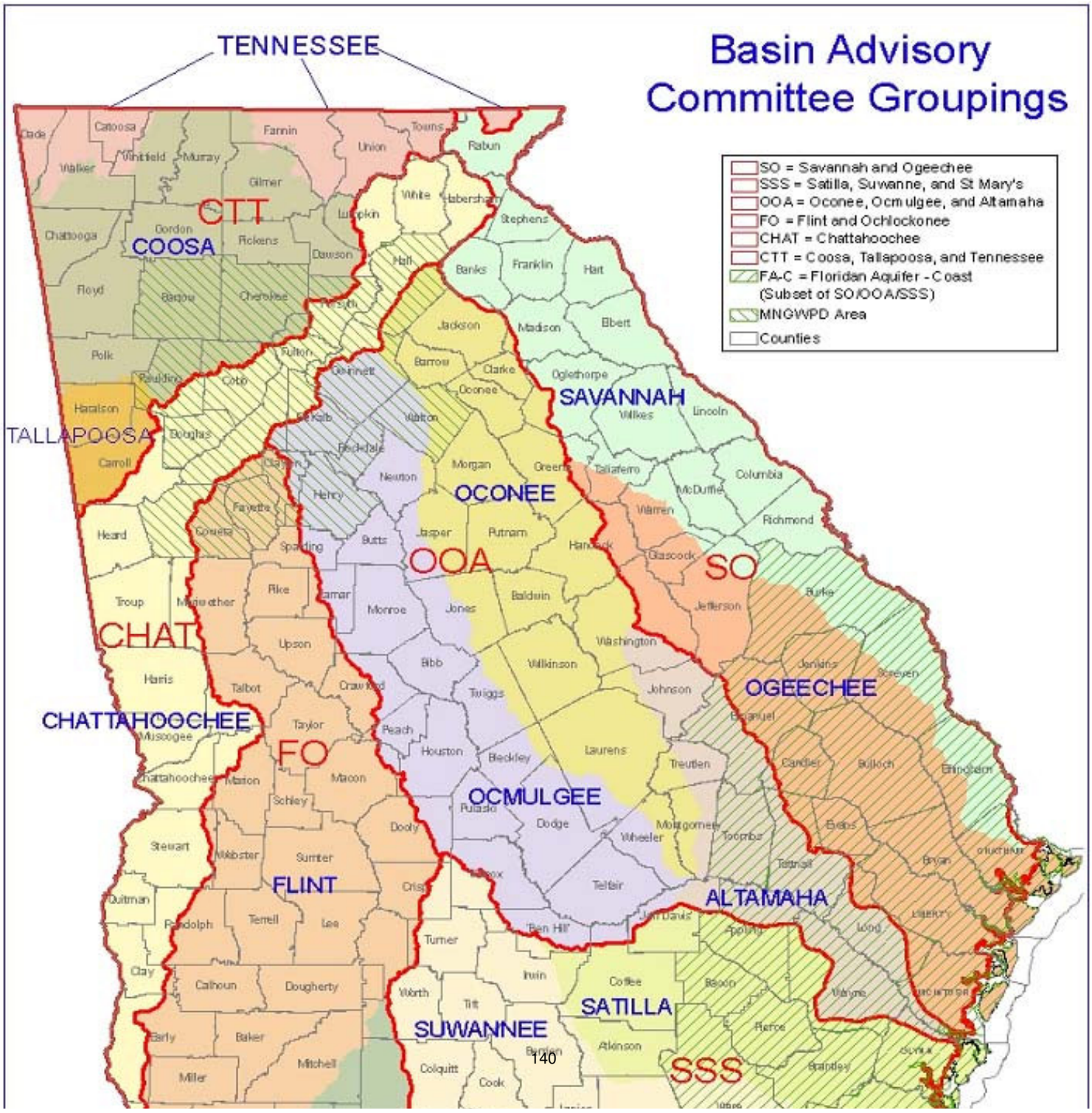
Mr. Brian Anderson	Whitfield County Commissioners	Dalton
Mayor Boyd Austin	City of Dallas	Dallas
Mr. Stan Bearden	New Riverside Ochre Company	Cartersville
Mr. John Bennett	City of Rome	Rome
Mr. Mike Berg	Dawson County Board of Commissioners	Dawsonville
Mr. Shawn Clouse	The Nature Conservancy	Atlanta
Ms. Doris Cook	Etowah County Water & Sewer Authority	Dawsonville
Mr. Joe Cook	Coosa River Basin Initiative	Rome
Mr. Don Cope	Dalton Utilities	Dalton
Mr. George Crowley	City of Calhoun, Council Member	Calhoun
Ms. Carrie Hunt	Shaw Industries Group	Dalton
Mr. Jerry Jennings	North Georgia RDC	Rome
Mr. Cody Laird	Mountain Conservation Trust of Georgia	Jasper
Mr. Sidney Lanier	Georgia Power	Rome
Mr. Ken Morrow	Sod Atlanta	Cartersville
Mr. Frank Riley	Landowner	Hiawassee
Mr. Tom Ritch	Landowner / Business	Rome
Mr. Don Sackman	Sackman Homes, LLC	Canton
Ms. Margaret Tanner	MACTEC	Kennesaw
Mr. Alfred Thomas		Chickamauga
Mr. Rozier Wingate	GACDC	Ellijay
Ms. Denise Wood	Mohawk Industries	Dalton

Metro Overlay Basin Advisory Committee

Mr. Doug Baughman	CH2M Hill	Atlanta
Mr. Rick Blackwell	Let's Go Fishing	Union City
Mr. Rick Brownlow	Metropolitan North Georgia Water Planning District	Atlanta
Ms. Becky Champion	Oxbow Meadows Environmental Learning Center	Columbus
Mr. David Dockery	City of Gainesville	Gainesville
Ms. Kit Dunlap	Greater Hall Chamber of Commerce	Atlanta
Mr. Christopher Ernst	Georgia Mountains RDC	Gainesville
Mr. Kevin Green	Metro Atlanta Chamber of Commerce	Atlanta
Mr. James Hazelwood		Cumming
Mr. Jon Heard	City of Cumming Department of Utilities	Cumming

Mr. Jamie Higgins	U.S. Army Corps of Engineers	Atlanta
Mr. Rob Hunter	City of Atlanta Department of Watershed Management	Atlanta
Ms. Birdel Jackson	B & E Jackson and Associates	Atlanta
Mr. John Lawrence		Douglasville
Mr. Steven Lofton	Regional Business Coalition	Atlanta
Mr. George Martin	Georgia Power	Atlanta
Mr. Steve McCullers	Cobb County Water Systems	Marietta
Mr. Dennis McEntire	Newnan Utilities	Newnan
Mr. Roy Middlebrooks	Rockdale County Commission	Conyers
Mr. Ron Papaleoni	Lake Allatoona Preservation Authority	Acworth
Mr. Michael Paris	Council for Quality Growth	Duluth
Mr. Michael Patton	Douglas County	Douglasville
Mr. Jim Scarbrough	Gwinnett County Department of Public Utilities	Lawrenceville
Mr. Frank Sherrill	Walton County Water & Sewer Authority	Social Circle
Ms. Bettie Sleeth	Home Builders Association of Georgia	Atlanta
Mr. Jim Stafford	City of Cartersville	Cartersville
Mr. George Taylor	Oglethorpe Power Corporation	Tucker
Ms. Shana Udvardy	Georgia Conservancy	Atlanta
Mr. Marty Williams		Marietta

Basin Advisory Committee Map



Miller
Cook
Lanier
Seminole
Decatur
Grady
Thomas
Brooks
Lowndes
Echols
Clinch
Charlton
OCHLOCKONEE
SAINT MARY'S

Technical Advisory Committee

The Technical Advisory Committees (TACs) consist of experts with scientific, technical, and practical experience who are actively working on or researching the topics being addressed in the water plan. Their purpose is to provide early input on specific technical questions needed to inform the policy options. TAC members are working with EPD staff to build the scientific and technical foundation upon which to develop policy options. EPD expects to organize more TACs as planning progresses.

Water Conservation TAC
Water Reuse TAC
Target Flow Regime TAC

Water Conservation TAC

Judy Adler	Pollution Prevention & Assistance Division
Cindy Daniel	Metropolitan North Georgia Water Planning District & Atlanta Regional Commission
Deatre Denion	City of Savannah
David Eigenberg	Georgia Soil and Water Conservation Commission
Bill Evans	Georgia Power
Jim Gleason	City of Woodstock
David Gustashaw	Interface, Inc.
Kerry Harrison	University of Georgia / NESPAL
Jim Hook	University of Georgia / NESPAL
Mark Johnson	Weyerhaeuser
Kathy Nguyen	Cobb County Water System
Rose Mary Seymour	Georgia Association of Water Professionals & Georgia WaterWise Council
Tom Shannon	Ewing Irrigation
Robert Sumner	Plumbing and Mechanical Association of Georgia
Shana Udvardy	Georgia Conservancy

Water Reuse TAC

Charlie Birkenkamper	City of Savannah

Mark Esoda	Georgia Golf Course Superintendents Association
Craig Ferguson	PBS&J
Daniel Johnson	Hayes, James, & Associates, Inc.
Michelle Lawrence	Fulton County Department of Public Works
Paul Morgan	Rain Harvest Company
Lawrence (Larry) Morris	UGA, Warnell School of Forest Resources
Don Plaisted	Duke Energy
Bob Scott	Irrigation Consultants
Frank Stephens	Gwinnett County Public Works
Jim Vaughn	Stevenson and Palmer

Target Flow Regime TAC

Merryl Alber	UGA, Department of Marine Sciences
John Biagi	DNR, Wildlife Resources Division
Mary Davis	The Nature Conservancy
Mary Freeman	USGS & UGA, Institute of Ecology
Larry Neal	MACTEC
Bob Scott	Georgia EPD
Sandy Tucker	U.S. Fish & Wildlife Service

Meeting Schedule

The following meetings are open to the public!

Water Council Meetings
Statewide Advisory Committee Meetings
Basin Advisory Committee Meetings

March 2006

Wed., March 1 1pm – 4 pm	Water Council Meeting	DNR Board Room, Atlanta
Wed., March 10 am – 4 pm	Flint – Ochlockonee BAC Meeting	Thomaston Chamber of Commerce 213 E Gordon St #A, Thomaston
Thurs., March 9 10 am – 4 pm	Coosa – Tallapoosa – Tennessee BAC Meeting	The Forum Civic Center Complex 2 Government Plaza, Rome
Mon., March 13 10 am – 4 pm	Metropolitan Overlay BAC Meeting	Loudermilk Center 40 Courtland St., Atlanta
Mon., March 13 10 am – 4 pm	Oconee – Ocmulgee – Altamaha BAC Meeting	Greater Macon Chamber Of Commerce 305 Coliseum Drive, Macon
Tues., March 14 10 am – 4 pm	Chattahoochee BAC Meeting	Columbus Water Works 1421 Veterans Parkway, Columbus
Tues., March 14 10 am – 4 pm	Satilla – Suwannee – St. Mary's BAC Meeting	Southeast Georgia RDC 1725 South Georgia Parkway, W. Waycross
Tues., March 21 10 am – 4 pm	Savannah – Ogeechee BAC Meeting	Augusta Technical College, Harvey Duncan Building - Auditorium 3200 Augusta Tech Drive, Augusta
Thurs., March 23 10 am – 4 pm	Statewide Advisory Committee Meeting	Capitol Education Center 180 Central Avenue, Atlanta

May 2006

Tues., May 2 10 am – 4 pm	Statewide Advisory Committee Meeting	Georgia Wildlife Federation 11600 Hazelbrand Road, Covington

June 2006

Wed., June 7	Water Council Meeting	Georgia Forestry Commission 5645 Riggins Mill Rd., Dry Branch (Macon)
Tues. June 20	Coosa – Tallapoosa – Tennessee BAC Meeting	TBA
Wed., June 21	Metropolitan Overlay BAC Meeting	TBA
Thurs., June 22	Flint – Ochlockonee BAC Meeting	TBA
Mon., June 26	Satilla – Suwannee – St. Mary's BAC Meeting	TBA
Tues., June 27	Savannah – Ogeechee BAC Meeting	TBA
Wed., June 28	Oconee – Ocmulgee – Altamaha BAC Meeting	TBA
Thurs., June 29	Chattahoochee BAC Meeting	TBA

Comprehensive Statewide Water Management Planning Act

SUMMARY | BILL

General Summary: This Act asks EPD to develop and propose a comprehensive statewide water management plan. This Act doesn't change any water laws or policies; instead, it merely asks EPD to develop a state plan, which will then be considered by the legislature in 2008. Any proposed changes to water laws or policies will be considered in the planning process.

Policy: The policy behind the Act states, "Georgia manages water resources in a sustainable manner to support the state's economy, to protect public health and natural systems, and to enhance the quality of life of all citizens." The EPD plan should be consistent with this statement.

The Water Council: The Water Council, created by this Act, consists of various legislative members and appointments and the heads of state departments with water related responsibilities. The Water Council is responsible for providing input in the planning process, coordinating input from various state departments, and ultimately approving the version of the plan that will be submitted to the legislature for final approval. EPD must present a draft plan to the water council by July 1, 2007.

Public Participation: EPD must solicit input from stakeholders and the public in the development of the water plan. Relevant stakeholders include businesses, nonprofit organizations, local governments, and others.

Process for Plan Adoption and Approval: The water plan will be presented for approval by the General Assembly by the 2008 legislative session. There are four possible ways for the water plan to go into effect:

1. The General Assembly approves the proposed plan
2. If the General Assembly rejects the first proposed plan, the Water Council may submit alternative plans through the 20th day of the session
3. The General Assembly can enact its own version of a plan, or
4. If no plan is approved or enacted by the legislature, then the initial version of the first plan presented to the General Assembly will automatically take effect.

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04 HB 237/AP

House Bill 237 (AS PASSED HOUSE AND SENATE)

By: Representatives Hanner of the 133rd, McCall of the 78th, Royal of the 140th, Smith of the 87th, and Powell of the 23rd

A BILL TO BE ENTITLED
AN ACT

To amend Chapter 5 of Title 12 of the Official Code of Georgia Annotated, relating to water resources, so as to enact the "Comprehensive State-wide Water Management Planning Act"; to provide legislative findings and declarations; to change certain provisions relating to river basin management plans; to provide for definitions; to require the development of a state-wide water management plan; to provide for principles on which such plan shall be based; to require all water withdrawal permit decisions to be made in accordance with such plan; to provide for effect of noncompliance with such plan; to provide for a Water Council and for its composition and duties; to provide procedures for plan development, adoption, and revision; to provide for related matters; to amend Code Section 50-13-4 of the Official Code of Georgia Annotated, relating to procedural requirements for adoption, amendment, or repeal of rules, emergency rules, limitations on actions to contest rules, and legislative override, so as to provide an exception; to provide an effective date; to repeal conflicting laws; and for other purposes.
BE IT ENACTED BY THE GENERAL ASSEMBLY OF GEORGIA:

SECTION 1.

The General Assembly finds and declares that:
(1) A comprehensive state-wide water management plan for this state is needed and should be developed by the Environmental Protection Division of the Department of Natural Resources;
(2) Such plan should support a structured, yet flexible, approach to regional water planning and provide guidance and incentives for regional and local water planning efforts; and
(3) Regional water planning efforts of the Environmental Protection Division should be coordinated with and not supplant the existing efforts of all state agencies.

SECTION 2.

Chapter 5 of Title 12 of the Official Code of Georgia Annotated, relating to water resources, is amended by striking Article 8, relating to river basin management plans, and inserting in lieu thereof the following:
"ARTICLE 8
12-5-520.
This article shall be known and may be cited as the 'Comprehensive State-wide Water Management Planning Act.'

12-5-521.
As used in this article, the term:
(1) 'Director' means the director of the Environmental Protection Division of the Department of Natural Resources.
(2) 'Division' means the Environmental Protection Division of the Department of Natural Resources.

12-5-522.
(a) The division shall develop and propose a comprehensive state-wide water management plan not inconsistent with this chapter and in accordance with the following policy statement: 'Georgia manages water resources in a sustainable manner to support the state´s economy, to protect public health and natural systems, and to enhance the quality of life for all citizens.'
(b) The following principles shall guide the work of the division in developing a comprehensive state-wide water management plan:
(1) Effective water resources management protects public health and the safety and welfare of Georgia´s citizens;
(2) Water resources are to be managed in a sustainable manner so that current and future generations have access to adequate supplies of quality water that support both human needs and natural systems;
(3) All citizens have a stewardship responsibility to conserve and protect the water resources of Georgia;
(4) Water resources management efforts must have a sound, scientific foundation and recognize that economic

prosperity and environmental quality are interdependent;
(5) Water quality and quantity and surface and ground water are interrelated and require integrated planning as well as reasonable and efficient use;
(6) A comprehensive and accessible data base must be developed to provide sound scientific and economic information upon which effective water resources management decisions can be based;
(7) Water resources management encourages local and regional innovation, implementation, adaptability, and responsibility for watershed and river basin management;
(8) Sound water resources management involves meaningful participation, coordination, and cooperation among interested and affected stakeholders and citizens as well as all levels of governmental and other entities managing or utilizing water; and
(9) Periodic revisions of the comprehensive state-wide water management plan may be required to accommodate new scientific and policy insights as well as changing social, economic, cultural, and environmental factors.
(c) The proposed comprehensive state-wide water management plan shall set forth state-wide water policies not inconsistent with this chapter which shall guide river basin and aquifer management plans, regional water planning efforts, and local water plans.
(d) The proposed comprehensive state-wide water management plan may include a process for creating draft river basin management plans and draft ground-water management plans and how such plans are finalized and revised, including how the public may participate in the creation and revision of such plans.
(e) The division shall make all water withdrawal permitting decisions in accordance with this chapter and the comprehensive state-wide water management plan that has been approved or enacted by the General Assembly as provided by this article. Any political subdivision or local water authority that is not in compliance with the plan shall be ineligible for state grants or loans for water projects, except for those projects designed to bring such political subdivision or local water authority into compliance with the plan.

12-5-523.
(a) The division shall work in cooperation, coordination, and communication with the Water Council created by Code Section 12-5-524 and any other state, local, regional, or federal agency as appropriate to develop a comprehensive state-wide water management plan.
(b) The division shall solicit extensive stakeholder involvement in the development of the proposed plan. Such stakeholders shall include, without limitation, other state agencies, nonprofit advocacy organizations, business organizations, local government entities and associations of local government entities, and regional development centers.
(c) The division shall submit a draft initial comprehensive state-wide water management plan to the Water Council for review no later than July 1, 2007.

12-5-524.
(a) There shall be a coordinating committee called the 'Water Council' composed of one member appointed by the Speaker of the House of Representatives who shall not be a member of the General Assembly and who shall serve for a term of four years and until a successor is appointed and qualified; one member appointed by the President Pro Tempore of the Senate who shall not be a member of the General Assembly and who shall serve for a term of four years and until a successor is appointed and qualified; and the following state officials who shall serve ex officio as members of the committee: the director of the division, the commissioner of natural resources, the executive director of the State Soil and Water Conservation Commission, the commissioner of community affairs, the commissioner of human resources, the Commissioner of Agriculture, the director of the Georgia Forestry Commission, and the executive director of the Georgia Environmental Facilities Authority. In addition, the chairperson of the Senate Natural Resources and the Environment Committee, ex officio, and one additional member of that committee to be selected by its chairperson and the chairperson of the House Committee on Natural Resources and Environment, ex officio, and one additional member of that committee to be selected by its chairperson shall each serve in an advisory capacity. Any vacancy among the two appointed members of the Water Council who are not members of the General Assembly other than for expiration of term shall be filled in the same manner as the original appointment for the unexpired term. The director shall serve as chairperson of the Water Council.
(b) The Water Council shall:
(1) Ensure coordination, cooperation, and communication among state agencies and their water related efforts in the development of a comprehensive state-wide water management plan;
(2) Provide input to the division concerning the development of a comprehensive state-wide water management plan;

(3) Review, modify if necessary, and approve the final draft of the proposed comprehensive state-wide water management plan; and
(4) Recommend such initial proposed plan for consideration by the General Assembly not later than the first day of the regular session of the General Assembly next occurring after such completion but not later than the first day of the 2008 regular session of the General Assembly.

12-5-525.
(a)(1)(A) No comprehensive state-wide water management plan submitted by the Water Council pursuant to this article shall have any force or effect unless approved by the General Assembly by means of the adoption of a joint resolution ratifying such plan, except as otherwise provided by this subsection. Upon the loss of any such resolution, the Water Council may submit successive alternate plans to the General Assembly not later than the twentieth day of the session for approval during such session.
(B) Subject to the same development process as provided by subsections (a) and (b) of Code Section 12-5-523 and review, modification if necessary, and approval by the Water Council in the same manner provided by subsection (b) of Code Section 12-5-524, the division may subsequently propose to amend or repeal a plan approved under subparagraph (A) of this paragraph; but no such proposed amendment or repeal shall become effective unless an initial version thereof is submitted to the General Assembly not later than the first day of a session and the amendment or repeal is approved by the General Assembly in the same manner as provided by subparagraph (A) of this paragraph.
(2) In lieu of approving a comprehensive state-wide water management plan in accordance with subparagraph (A) of paragraph (1) of this subsection, the General Assembly may enact a statutory comprehensive state-wide water management plan.
(3) If:
(A) The General Assembly fails to approve a comprehensive state-wide water management plan in accordance with subparagraph (A) of paragraph (1) of this subsection during the session in which such a proposed plan was timely presented by the Water Council to the General Assembly for approval; and
(B) A statutory comprehensive state-wide water management plan provided by an Act of the General Assembly that expressly supercedes any and all comprehensive state-wide water management plans submitted by the Water Council to the General Assembly for approval does not become law on or before July 1 next occurring after the session in which such a proposed plan was timely submitted by the Water Council to the General Assembly for approval,
then the comprehensive state-wide water management plan submitted latest in time but not later than the twentieth day of the session by the Water Council to the General Assembly shall become of full force and effect without the approval of the General Assembly on July 1 next occurring after the session in which such proposed plan was timely presented to the General Assembly for approval.
(b) If at any time after a comprehensive state-wide water management plan has become effective under subsection (a) of this Code section and between the adjournment sine die of a regular session of the General Assembly and prior to the convening date of the next regular session of the General Assembly the director finds that there is an actual or impending emergency or disaster of natural or human origin or a public health emergency within or affecting the state and that strict compliance with any provision or provisions of such plan presents an imminent peril to the public health, safety, or welfare and states in writing his or her reasons for those findings, the Water Council may approve a temporary waiver of such provision or provisions but only to the extent necessary to alleviate the peril. Such waiver shall be effective upon such approval by the Water Council and for not longer than the duration of the emergency or until the twentieth legislative day of the next regular session of the General Assembly, whichever first occurs.
(c) After a comprehensive state-wide water management plan becomes effective pursuant to subsection (a) of this Code section, the division shall review such plan in its current form not later than July 1, 2010, and at least every three years thereafter, for purposes of determining whether revision of such plan is necessary or appropriate for recommendation."

SECTION 3.

Code Section 50-13-4 of the Official Code of Georgia Annotated, relating to procedural requirements for adoption, amendment, or repeal of rules, emergency rules, limitations on actions to contest rules, and legislative override, is amended by adding a new subsection to read as follows:
"(i) This Code section shall not apply to any comprehensive state-wide water management plan or revision thereof prepared by the Environmental Protection Division of the Department of Natural Resources and proposed, adopted, amended, or repealed pursuant to Article 8 of Chapter 5 of Title 12."

SECTION 4.

This Act shall become effective upon its approval by the Governor or upon its becoming law without such approval.

SECTION 5.

All laws and parts of laws in conflict with this Act are repealed.

MANAGEMENT OBJECTIVE #1:

Minimizing Water Withdrawals

The tools for minimizing withdrawals are water conservation, water efficiency, and water reuse. Water conservation is the beneficial reduction of water loss, waste, or use. It provides numerous benefits, such as extending our water supply, helping maintain natural flows, and as a result, reducing contaminants in our water supply. Water conservation can also prevent the need for expanding our water supply and infrastructure that come with our growing population.

Water efficiency and water reuse come under the umbrella of water conservation. Water efficiency is using the least amount of water possible to achieve a water use function. Water reuse means using previously used and treated water (reclaimed wastewater) as a substitute for another, generally higher quality, water source.

The following is a summary of Georgia EPD's goals for water conservation and the proposed resource-based tiered approach, with examples of specific conservation practices.

Nine Water Conservation Goals

Information Goals:

1. Meter water uses and improve water user reporting
2. Conduct reuse feasibility studies
3. Conduct water audits
4. Build understanding of conservation through education and outreach

Conservation Goals:

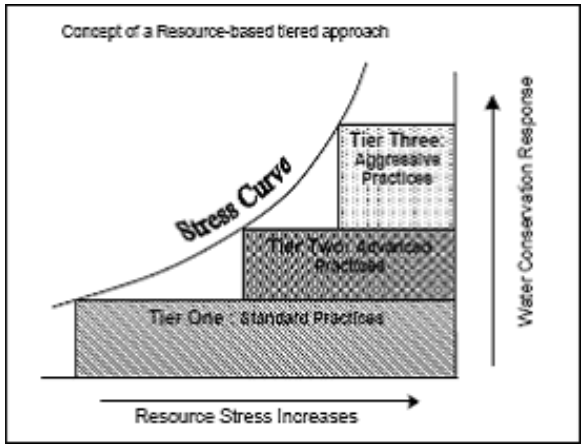
5. Reduce water loss
6. Minimize outdoor water use and waste
7. Maximize in-house efficiency
8.

Adopt conservation-oriented rate structures

9. Adjust management practices to minimize water use

Resource-based Tiered Approach

EPD has offered a conceptual framework for minimizing withdrawals that is a resource-based tiered approach. This approach uses the condition of the water resource to base the water resource response. In other words, the higher the measure of stress or scarcity of the water resource, the more aggressive the expected conservation response would be.



At present time, there is insufficient data and information to quantify resource stress and the appropriate water conservation response. Resource stress could be related to water quality, habitat needs, current population, and growth rates. Water conservation responses could be quantified as the reduction of gallons per capita per day (gpcd), reduction percentage of water withdrawals, or the reduction of water used to produce a crop or product.

Within this framework, EPD has established tiers of water conservation practices that entities are expected to implement to meet the Water Conservation Goals. Tier One contains standard practices, those that all water users and permit holders can accomplish. Tiers Two and Three are more aggressive water conservation responses that will result in a higher degree of water savings.

Georgia-specific Water Conservation Practices

The following is a list of major water users and examples of water conservation practices for consideration under the resource-based tiered approach.

Links are provided to view the full range of practices proposed by EPD. Examples of water conservation practices are categorized under the water conservation goals related to each major water user. Practices are listed as mandatory or voluntary.

Agricultural Irrigation Water Users

Examples of Tier One practices being considered are as follows:

- Reduce water loss by ensuring appropriate operating pressure on irrigation systems and irrigating only at night

- Conduct regular water audits
- Install meters and report annual water usage
- Minimize outdoor water use by installing rain or moisture sensor shutoff devices, replacing old sprinkler packages on center pivots with more efficient packages, converting set irrigation to drip irrigation systems, and replacing older inefficient nozzles with high efficiency ones

Golf Course Water Users

Examples of Tier One practices being considered are as follows:

- Permit applicants attend workshops or training on water conservation and efficient use of water
- Existing water users to meter water uses not currently metered
- Reduce water loss by ensuring appropriate operating pressure on irrigation systems and irrigating only at night
- Minimize outdoor water use by using most efficient irrigation practices, installing rain or moisture sensor shutoff devices, replacing older sprinkler packages with more efficient packages, and converting set irrigation to drip irrigation systems

Industrial Water Users and Power Providers

Examples of Tier One practices being considered are as follows:

- Conduct water audits that include in-process and cross-process reuse capability, reusing treated wastewater in house, and taking treated wastewater from another source
- Build understanding of conservation by distributing water conservation literature to staff members and sending senior management team to workshops or training sessions about conservation, efficiency, and reuse
- Meter all outdoor water uses not currently metered and uses of reuse water and report use
- Maximize in-house efficiency by decreasing down-time and minimizing start-up time, replacing older indoor plumbing fixtures with more efficient ones, implementing water conservation practices identified in system audit, and limiting or prohibiting single-pass cooling systems in all facilities

Public and Private Water Providers

Examples of Tier One practices being considered are as follows:

- Build understanding of conservation by adopting water bills that reflect consumer usage, creating a local or regional water conservation staff position to facilitate conservation activities, and implementing water conservation education in schools
- Meter all water uses, including outdoor water uses not currently metered and new multi-family residential buildings with individual meters
- Maximize in-house efficiency by offering low flow retrofit kits and rebates for high efficiency fixtures and for retrofitting older homes with water-savings products
- Adopt conservation-oriented rate structures for residential customers and for any reuse water used by customers

Nine Water Conservation Goals

Information Goals

1. Meter water uses and improve water user reporting

Currently, most water withdrawals are metered at the point where water leaves its sources, but very little is known about how that water is being used. Without knowing the end use to where water is going, it is nearly impossible to suggest specific ways for improving efficiency. Ideally, meters would be placed at the water source, the water treatment plant, and each end use.

Water usage is valuable for making accurate assessments of reasonable use, estimating future water needs and conservation results more precisely, and ensuring instream and downstream uses are not reduced. EPD currently receives water use data from various sources, such as the water withdrawal permitting process and associated water conservation plans (GA Rules & Regs 391-3-2 and 391-3-6-.07), progress reports required every five years (GA Rules & Regs 391-3-6-.07(4)(b)(8)), and regional planning efforts, including the Metropolitan North Georgia Water Planning District (O.C.G.A. § 12-5-57), Flint River Water Development and Conservation planning (O.C.G.A. § 12-5-541), and saltwater intrusion management planning in the 24-county coastal region (EPD 2005).

2. Conduct reuse feasibility studies

Reuse water can provide several services, including conserving source water for other uses, minimizing peak demands on other water sources, and limit pollutant loads to streams that would have to assimilate remaining pollutants in the discharged water.

Reuse feasibility studies should include an assessment of reclaimed water for purposes such as in-process and cross-process operations and agriculture and landscape irrigation; a calculation of return flows to surface water to avoid expenditures for additional water treatment capability; and consider reuse water storage concerns.

3. Conduct water audits

Regularly conducted water audits can inform water providers and users of ways to improve or eliminate water lost through leaks and aging appliances, equipment, and infrastructure. Water audits can save energy, water, and the associated costs through more efficient practices. Ideally, an audit would identify specific improvements for water efficiency and reuse and recommend an implementation process and timeframe.

4. Build understanding of conservation through education and outreach

Educational and outreach programs can encourage shifts in behaviors regarding water use, waste, and loss, which are all important aspects of sustainability for future generations. Public outreach and public involvement have been closely linked to successful water conservation programs nationwide (Keyes et al 2004). All water use sectors can benefit from education and outreach programs, but messages must be tailored for each sector.

Conservation Goals

5. Reduce water loss

Water loss provides no revenue to water providers, can cause irrigation problems due to over-watering, and can cause infrastructure problems in cities and counties (i.e., sink holes and washed out roads). According to EPA (1998), water loss prevention can include pipe and fixture inspection, lining, cleaning, and other basin maintenance to improve the distribution system and prevent leaks from occurring. Several methods and programs exist to help municipal, industrial, and agricultural water users reduce the amount of water lost.

Clayton County Water Authority implemented a water-conserving leak detection and repair program. Within five years, the county recovered 2 billion gallons of water being lost to leaks and ~$9 in production savings for every $1 spent on the program (Jones 2004).

6. Minimize outdoor water use and waste

Outdoor water use varies across the state. However, water use significantly increases during summer months statewide. This high demand stresses water delivery systems and causes providers to invest a lot of money to meet peak water demands.

7. Maximize in-house efficiency

Residential indoor water use has declined since the early 1990s due to installing water efficient appliances and fixtures, such as toilets and showerheads. State and federal laws passed in the early 1990s maintain that only low-flow fixtures can be purchased for new construction or renovations. However, many homes and businesses built before these laws continue to have inefficient, high-volume fixtures. It is estimated that retrofitting older homes with water-conserving fixtures can result in as much as 35% reduction in indoor water use (Vickers 2001).

8. Adopt conservation-oriented rate structures

Conservation-rate structures rely on the principle of the more water you use, the more you pay. This can discourage water use by charging the consumer based on the volume of water consumed. Bills could be split into two sections: one that covers basic operating and maintenance of the water treatment and delivery systems and another that is based on the volume of water used by the consumer. Seasonal surcharges or excess use charges could also be included.

9. Adjust management practices to minimize water use

Adjusting management practices can result in water savings without the need for costly technical advancements or efficiency devices. For example, developing and/or updating water conservation plans can result in short- and long-term savings with minimal costs.

Unilever Home & Personal Care, a powdered laundry detergent manufacturer in Cartersville, Georgia, invested in non-

contact cooling water and collected rainwater in manufacturing processes. Their investment resulted in the following savings:

- 77% reduction in effluent volume
- $20,000 per year in potable water savings
- $85,000 per year in savings for testing, maintenance, and labor (Iott & Adler web info)

Agricultural Irrigation
Tier One - Standard Water Conservation Practices

Voluntary	Mandatory
Conducting Water Audits	
Water withdrawal permit holders to perform regular water audits of irrigation systems.	
Build Understanding of Conservation through Education and Outreach	
Applicants for new, adjusted or renewed water withdrawal permits to attend workshops or training on water conservation and efficient use of water.	
Metering Water Uses and Improving Use Reporting	
Permit holders to install meters and report annual water usage.	New or altered agricultural water withdrawal water use permit holders to submit annual water use reports.
Reduce Water Loss	
New permit holders to irrigate only at night.	Permit holders to ensure appropriate operating pressure on irrigation systems.
Minimize Outdoor Water Use	
Permit holders to replace older agricultural sprinkler packages on center pivot systems with more efficient/uniform package.	New agricultural water use permits to use most efficient irrigation practices.
Permit holders to convert set irrigation to drip irrigation systems.	Permit holders to install rain or moisture sensor shutoff devices on irrigation systems.
Permit holders to practice irrigation scheduling method.	
Permit holders to replace older in-efficient nozzles with high efficiency ones.	

Maximize Water Conservation through Management Planning	
Remove unproductive agricultural land from irrigation.	Applicants for new permits to submit a water conservation plan with application.

Agricultural Irrigation
Tiers Two and Three
Examples of Advanced or Aggressive Conservation Practices

Mandatory - All water withdrawal permit holders to perform regular water audits of irrigation systems.

Mandatory - Applicants for new, adjusted or renewed water withdrawal permits to attend workshops or training on water conservation and efficient use of water.

Mandatory - Permit holders to practice irrigation scheduling method.

Mandatory - Permit holders to replace older in-efficient fixtures with high efficiency ones.

Mandatory - Existing agricultural water users to use most efficient irrigation practices.

Mandatory - Remove unproductive agricultural land from irrigation.

Voluntary or mandatory - limit agricultural water irrigation use or increases in overall volume of water being withdrawn.

Voluntary or mandatory - agricultural water users to self-report monthly water usage.

Source: EPD. 2006. Minimizing withdrawals BAC discussion packet.

Golf Course Water Users
Tier One - Standard Water Conservation Practices

Voluntary	Mandatory
Conduct Water Audits	
Golf course water users to perform regular water audits of irrigation systems.	
Build Understanding of Conservation through Education and Outreach	
Applicants for new, adjusted or renewed water withdrawal permits to attend workshops or training on water conservation and efficient use of water.	
Meter Water Uses and Improving Use Reporting	
	New or altered water golf course permit holders to submit annual water use reports. Existing golf course water users to meter water uses not currently metered.
Reduce Water Loss	
New permit holders to irrigate only at night.	Permit holders to ensure appropriate operating pressure on irrigation systems.
Minimize Outdoor Water Use	
Permit holders to replace older irrigation sprinkler packages with more efficient/uniform package. Golf Course water users to convert set irrigation to drip irrigation systems.	New agricultural water use permits to use most efficient irrigation practices. Golf course users to install rain or moisture sensor shutoff devices on irrigation systems.

Maximize Water Conservation through Management Planning	
	Applicants for new permits to submit a water conservation plan with application.
Conduct Reuse Feasibility Studies	
Use reuse water for irrigation where available.	Applicants for new, altered or renewed water withdrawal permits are to conduct reuse feasibility studies.

Golf Course Water Users
Tiers Two and Three
Examples of Advanced or Aggressive Conservation Practices

Mandatory - Golf course water users to perform regular water audits of irrigation systems.

Mandatory - applicants for new, adjusted or renewed water withdrawal permits to attend workshops or training on water conservation and efficient use of water.

Mandatory - existing permit holders to replace older irrigation sprinkler packages with more efficient/uniform package.

Mandatory - use reuse water for industrial operations where available.

Source: EPD. 2006. Minimizing withdrawals BAC discussion packet.

Industrial Water Users and Power Providers
Tier One - Standard Water Conservation Practices

Voluntary	Mandatory
Conduct Water Audits	
	Conduct regular facility specific water audits to include: - In-process reuse capability (I.e. condensate recovery) - Cross-process reuse capability (I.e. using process water in other processes) - Reusing treated wastewater in house (end-of-pipe reuse) - Taking treated wastewater from another source
Build Understanding of Conservation through Education and Outreach	
Send management team and senior staff to workshops or training on water conservation and efficiency.	Distribute literature regarding water conservation to staff members.
Meter Water Uses and Improving Use Reporting	
Reuse water users to report reuse use and effectiveness regularly.	Industrial water users to meter all outdoor water use not currently metered. Permit holders to meter all uses of reuse water and report use
Reduce Water Loss	
Ensure appropriate operating pressure regulation on irrigation systems.	Adopt maintenance and repair program for pipelines, intakes and discharge structures.
Minimize Outdoor Water Use	
Install rain or moisture sensor shut off device on existing irrigation systems	Install rain or moisture sensor shut-off on new irrigation systems. Irrigate landscape only between 10:00pm and 10:00am

Maximize Water Conservation through Management Planning	
Practice dry clean up.	Regularly update water conservation plans to reflect new and changing circumstances/trends in water management.

Conduct Reuse Feasibility Studies	
Use reuse water for industrial operations where available.	Applicants for new, altered or renewed water withdrawal permits are to conduct reuse feasibility studies.

Maximize In-House Efficiency
Decrease down-time and minimize start-up (i.e. the time a plant is not operating).
Replace older in-door plumbing fixtures (toilets, faucets, showerheads) with more efficient ones.
Implement water-conservation practices identified in a system audit.
Limit or prohibit single-pass cooling systems in all facilities.

Industrial Water Users and Power Providers
Tiers Two and Three
Examples of Advanced or Aggressive Conservation Practices

Mandatory - install rain sensor shutoff devices on existing irrigation systems.

Mandatory - limit high quality water use for industrial operations; use reuse water.

Mandatory - Implement water-conservation practices identified in a system audit.

Mandatory - Limit or prohibit single-pass cooling systems in all facilities.

Mandatory - Replace older in-door plumbing fixtures (toilets, faucets, showerheads) with more efficient ones.

Voluntary or Mandatory - Sub-meter and report all in-house water uses

Source: EPD. 2006. Minimizing withdrawals BAC discussion packet.

Public and Private Water Providers
Tier One - Standard Water Conservation Practices

Voluntary	Mandatory
Conduct Water Audits	
Offer residential water audits (indoor and outdoor) residential customers.	Conduct regular water system audit (from withdrawal to meter)
Offer commercial, industrial and institutional customers water audits.	Require customers installing new irrigation systems to include a water budget with new system audit.
	Require commercial customers with irrigation systems to conduct regular irrigation system audits.
Build Understanding of Conservation through Education and Outreach	
Provide workshops/educational sessions to customers on designing, installing, and maintaining irrigation systems and ways to minimize outdoor watering.	Adopt water bills that reflect consumer usage (compared annually) and clearly stating which "conservation rate" in which they fall.
	Create a local or regional water conservation staff position to facilitate conservation activities.
	Implement water conservation education program in schools.
Meter Water Uses and Improving Use Reporting	
Meter existing multi-family residential buildings with individual meters.	Meter all water uses (current and future).
	Meter new multi-family residential buildings with individual meters.
	Meter all outdoor water uses not currently metered.
	Permit holders to meter all uses of reuse water and report use regularly.

Reduce Water Loss	
Ensure appropriate operating pressure regulation on irrigation systems.	Providers to adopt the new AWWA-indorsed International Water Association water loss program.
	Providers to calibrate meters regularly.
	Providers to adopt a meter replacement program.

Minimize Outdoor Water Use	
Providers to offer a rebate program for advanced irrigation controllers that have weather or soil moisture adjusted systems.	Providers to require rain or moisture sensor shut-off devices installed on all new landscape irrigation systems.
Providers to promote Georgia-friendly and water efficient landscaping.	Providers to meter all outdoor water uses that are not currently metered (including public uses.)
Providers to charge those who hold irrigation only accounts the highest tier amount per volume of water.	Providers to require golf course customers to comply with outdoor watering requirements around clubhouses.
Providers to work with city or county governments to adopt ordinances that prohibit wasteful use of outdoor water (such as watering impervious surfaces, runoff from landscaped property, etc)	

Maximize Water Conservation through Management Planning	
Providers to install dual-distribution (purple pipe) lines for irrigation purposes in new service areas.	Regularly update water conservation plans to reflect new and changing circumstances/trends in water management.
Providers to encourage grey water or rainwater harvesting as a substitute for potable irrigation water uses.	

Conduct Reuse Feasibility Studies	
Use reuse water as a substitute for potable irrigation purposes, where possible.	Applicants for new, altered or renewed water withdrawal permits are to conduct reuse feasibility studies.

Maximize In-House Efficiency
Providers to implement conservation-oriented practices identified in system audit.
Offer low flow fixture retrofit kits to residential users.
Offer rebates for the purchase of high water efficient clothes washing machines.
Offer rebates/vouchers for retrofitting older homes with the water-savings products (such as toilets and showerheads).
Offer fixture replacement program with direct installation of ultra-low flow toilets.
Require fixtures in older homes to meet codes for new buildings prior to new water service.
Offer food service operations with low-flow pre-rinse spray valves and installation.
Offer toilet retrofit program for industrial, commercial, and institutional customers.

Adopt Conservation-Oriented Rate Structures	
Implement seasonal surcharges to reduce peak demands.	Implement a tiered water conservation rate structure for residential customers.
Implement individualized tiered rate structure for all water use customers.	Adopt a rate structure for any reuse water used by customers.

Public and Private Water Providers
Tiers Two and Three
Examples of Advanced or Aggressive Conservation Practices

Mandatory - offer residential water audits (indoor and outdoor) residential customers.

Mandatory - offer commercial, industrial and institutional customers water audits.

Voluntary or Mandatory - calibrate meters annually.

Mandatory - Providers to require rain or moisture sensor shut-off devices installed on existing landscape irrigation systems.

Mandatory - providers to install dual-distribution (purple pipe) lines for irrigation purposes in new service areas.

Mandatory - providers to implement conservation-oriented practices identified in system audit.

Mandatory - implement 2-3 practices identified below:

- Offer low flow fixture retrofit kits to residential users.
- Offer rebates for the purchase of high water efficient clothes washing
- Offer rebates/vouchers for retrofitting older homes with the water-savings products (such as toilets and showerheads).
- Offer fixture replacement program with direct installation of ultra-low flow toilets.
- Offer toilet retrofit program for industrial, commercial, and institutional customers.

Mandatory - Require that fixtures in older homes to meet codes for new buildings prior to new water service.

Mandatory - offer food service operations with low-flow pre-rinse spray valves and installation.

Mandatory - install sub-meters on all multi-family residential units.

Source: EPD. 2006. Minimizing withdrawals BAC discussion packet.

MANAGEMENT OBJECTIVE #2:

Maximizing Returns to River Basins

The second management objective is Maximizing Returns to River Basins. Maintaining stream flows is a critical component of water management planning. Rivers require a broad spectrum of flow conditions, such as low flows, high flows, and floods. Variable flows are important for the movement of plants and animals upstream and downstream, the survival and reproduction of aquatic species, the salinity levels in coastal estuaries, and the natural processes that remove nutrients, toxins, and other pollutants.

Many factors affect stream flow. We have no control over some factors, such as climate, stream and aquifer interactions, ground cover, and the slope of land. This section focuses on three human factors that affect stream flow:

- **Interbasin Transfers**
- **Septic Systems**
- **Land Application Systems**

Maximizing water returns to basins provides the following benefits:

- Support human consumption and economic development
- Assimilate current and future pollutant loadings that come from point and nonpoint source pollution
- Produce electrical power by stream flow through turbines
- Support water-based recreational activities
- Maintain flow volume and historic flow patterns
- Support the health and diversity of native aquatic communities, which depend upon water quantity timing and water quality

EPD's Prototype Policy Framework

EPD's proposed policy framework is based on the following presumption: If water consumed upstream is managed so that the long-term patterns of downstream flow regimes are unaffected, then all reasonable opportunities to meet instream needs and downstream uses will be preserved. This framework is based on the "reasonable use" principle, which is foundational to Georgia's water allocation laws. The reasonable use principle requires full consideration of the

needs of downstream users when making upstream consumptive decisions.

The framework has three key components:

- Establish desired flow regimes in sub-basins
- Set a "safe allowable consumptive use" limit for sub-basins
- Manage interbasin transfers, septic systems, and land application system within sub-basins to conform to "safe allowable consumptive use"

Policies and Practices to Maximize Returns

EPD has identified the following four categories of actions that could be taken to maximize water returns and address potential flow impacts related to interbasin transfers (IBT), septic systems, and land application systems (LAS). State or cities that are using similar practices are noted in parentheses.

Policies and Practices to Maximize Returns	
Category 1: Require studies and monitoring to demonstrate returns to donor basins and assess long-term impacts on water resources.	
General	• For any activities that may result in loss of water from a donor basin, allow the director to require an environmental impact report that considers the impact of the activity on present and future water uses and water quality in the donor basin and that includes a plan to meet water supply needs in the donor basin for a minimum of 25 years (Connecticut)
For LAS	• Require applicants for LAS and/or the use of reclaimed water to demonstrate that the activity conserves water supplies, facilitates the indirect recharge of groundwater, and provides an alternative to discharging wastewater effluent to surface water (i.e., in areas where surface water quality is a limiting factor) (Maryland)
For Septic Systems	• For proposed developments using individual or community septic systems, require studies and analyses to confirm that the systems do not adversely affect water availability of ground or surface water now or in the future (Florida)
For IBT	• Require applicants for a permit that would result in an interbasin transfer to conduct an analysis of several concerns for the donor basin including, but not limited to: water for projected future needs; potential benefits of water lost from the transfer; correlation between ground and surface water and any harm that will result from the transfer; interference of planned uses; and alternative sources of water that would not result in a transfer (Oregon)
Category 2: Establish permitting requirements or standards for any activity that would result in a loss of water from the basin of origin.	
General	• Allow activities that will result in a loss of water from the basin of origin *only* when the activity is found necessary; is compatible with long-range water resource planning for the state; and is consistent with the state's water management goals and conservation and development plans (Connecticut) • Implement comprehensive watershed-based permitting that links water supply and wastewater discharge permits • To protect the natural resources impacted by the proposed activity, allow the General Assembly to attach terms and conditions to any permit that would result in a loss of water from the donor basin (Oregon)

For LAS	• In areas where reclaimed water is available, prohibit the use of potable water for non-potable uses that are not directly discharged back to a surface water source. Examples include irrigation for cemeteries, golf courses, parks, highway landscaped areas, and some industrial uses (California) • Allow LAS only in areas where there is 1) a demonstrated need for the application and where the LAS would offset the use of an existing or pre-determined water source (i.e. for irrigation purposes) or 2) a demonstrated water quality benefit of the application system (i.e. constructed wetlands) • Require that new LAS be sited within the watershed or drainage basin from which the water originated
For Septic Systems	• Create one statewide program for septic system regulation. Such a program could consider human health and environmental health conditions collectively • In localities that provide public sewer services, only issue permits for septic systems in areas where public sewer service is not feasible (Colorado)
For IBT	• Develop a permitting process specific to interbasin transfers • Condition any water withdrawal or discharge permit that would result in an interbasin transfer on specific considerations. Considerations could include the water quality of the gaining basin and the donor basin, water quantity necessary to meet current and future needs of the donor basin (instream and offstream), and level of water conservation activities implemented by the recipient of the transferred water, among others
Category 3: Establish local and/or regional actions to phase out activities that contribute to a net loss of water from the donor basin.	
For Septic Systems	• Encourage or require sewer tie-in for existing buildings or new developments within a certain distance of a sewer line (Gwinnett Co., Columbus, GA; Maine) • Encourage or require dry sewers in new developments • Coordinate development and infrastructure planning and decisions. Encourage or require that local infrastructure or facilities plans guide decisions regarding future sewer service expansions, installation of dry sewers, etc. • Allow local governments to prohibit development on septic systems in certain areas • Adopt and implement policies or local ordinances to prevent septic system failure. Ensure that owners of properties with septic systems monitor and regularly maintain individual or community septic systems to limit adverse affects on human health or water availability from ground or surface water sources • In areas approaching limitations on consumptive use, require local policies or ordinances that increase use of sewer service. Policies can include septic moratoria or sewer tie-in provisions for existing buildings and/or for new developments
For LAS	• Encourage or require that any new developments with dual-distribution line (i.e., purple pipe for reuse water) be located within the watershed or drainage basin from which the water originated
Category 4: In areas approaching limitations on consumptive use, allow or require direct augmentation of stream flow in the basin of origin	
General	• Allow water users to use reclaimed water to augment the flow of surface water systems (Washington). EPA allows reclaimed water to be discharged directly for purposes such 1) maintaining adequate flows for aquatic life and 2) for downstream use

Interbasin Transfers

An interbasin transfer (IBT) is the transfer of water from one river basin (known as the donor basin or basin-of-origin) into another basin (known as the receiving or gaining basin). This transfer results in a net loss of water for the donor basin and a net gain for the receiving basin.

The most common type of IBT in Georgia is when municipal water supply is withdrawn from one basin but the wastewater is discharged into a different basin. This happens when water utilities are serving populated areas within political, not hydrologic, boundaries. Another type is the wholesale transfer of treated water from one basin to another that is under stress, or having trouble meetings needs with its set amount of water.

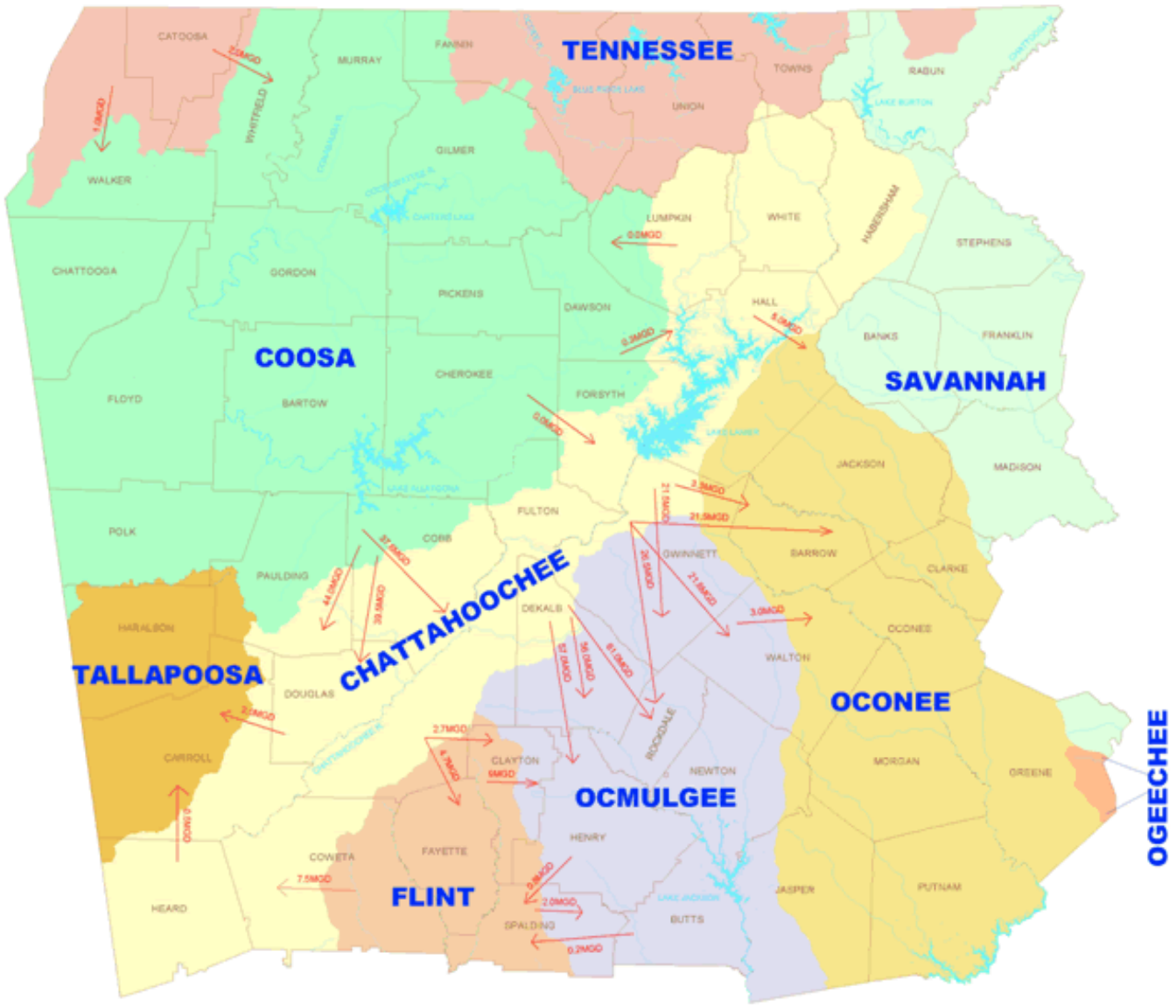
IBTs have implications for downstream users in the donor basin, which could be quite dramatic depending on the location and amount of withdrawal. IBTs can alter natural water flows and aquatic habitats, reduce a stream's ability to assimilate pollutants, and negatively impact downstream communities that need flows for economic, municipal, and recreational uses.

Most IBTs occur within the 16-county Metropolitan North Georgia Water Planning District. The District is spread over portions of five river basins – three flowing to the Gulf of Mexico (Chattahoochee, Etowah (sub-basin of Coosa), and Flint) and two flowing to the Atlantic Ocean (Oconee and Ocmulgee). There are water and wastewater transfers in and out of every basin in the District, with the majority moving out of the Chattahoochee. IBTs are common in counties situated on a ridge line between two or more basins, which is the case for 13 of 16 counties in the District (CVIOG 2006).

Charts and Maps

Map of IBTs in Northwest Georgia

NW Georgia Interbasin Water Transfers



2004 Interbasin Transfers of At Least 1 Million Gallons per Day (mgd)

Water System Transferring	*Basin Donor/Gaining*	*Net Annual Average (mgd)*
DeKalb County	Chattahoochee to Ocmulgee	40.3
Gwinnett County	Chattahoochee to Ocmulgee	19.9
City of Gainesville	Chattahoochee to Oconee	5.5
Gwinnett County	Chattahoochee to Oconee	1.0
City of Atlanta	Chattahoochee to Flint	4.6
Carroll Co. Water Auth.	Chattahoochee to Tallapoosa	2.3
Cobb Co. Water Auth.	Coosa to Chattahoochee	23.1
Clayton County	Flint to Ocmulgee	9.7
City of Griffin	Flint to Ocmulgee	7.2
Monroe Utility Network	Ocmulgee to Oconee	1.1

Source: Georgia EPD. 2006. Maximizing Returns BAC Discussion Packet.

2004 Net Losses/Gains (by Basin)			
River Basin	*Amount Gained (mdg)*	*Amount Lost (mgd)*	*Net (mgd)*
Chattahoochee	23.1	73.6	-50.5
Coosa	0	23.1	-23.1
Flint	4.6	16.9	-12.4
Ocmulgee	77.1	1.1	76.0
Oconee	7.6	0	7.6
Tallapoosa	2.3	0	2.3

Source: Georgia EPD. 2006. Maximizing Returns BAC Discussion Packet.

Metropolitan North Georgia Water Planning District

Source: Metropolitan North Georgia Water Planning District 2006

Septic Systems

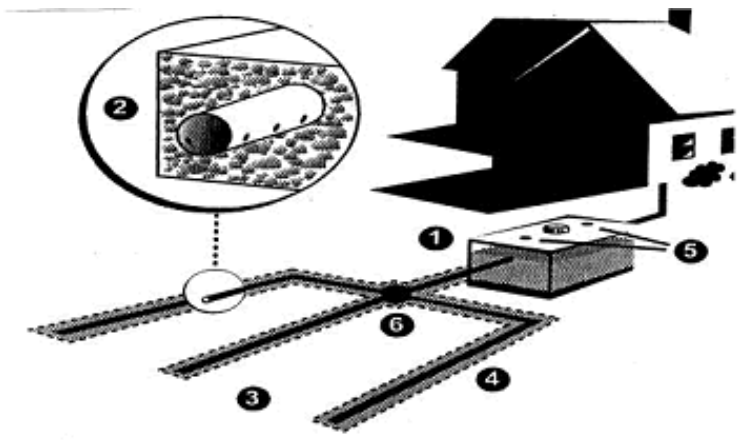
From the standpoint of maximizing returns, septic systems are a concern because there is no measurable return flow from septic systems back into the river. In contrast, with sewer systems, water withdrawn from a river or reservoir and used by home or businesses is treated at a treatment plant and put back into the river. With septic systems, the quantity and timing of the return flow is difficult to measure because the water from each individual house is filtered through soils in a drain field. Therefore, septic systems are considered a consumptive use because they reduce the amount of water returned to the water source.

How Septic Systems Function

Septic systems, or onsite sewage disposal systems, are relied on throughout Georgia as a means of disposing human waste. Septic systems have two treatment stages. The first stage takes place in an underground holding tank, where the separation and settlement of solids occurs. Over time, some solids decompose, and some remains in the bottom of the tank. The second stage occurs in the drain field, where the liquid effluent from the tank is naturally filtered in the soils of the drain field. This stage removes the remaining dissolved organic matter through natural bacteriological processes.

The remaining water slowly filters into aquifers below ground, and some reaches surface water through stream/aquifer interactions. Some water is sequestered in the soil and is evapotranspired through plants. Therefore, with septic systems, only a fraction of the water used is returned to the surface water source, and the water that does return only gets there after a lengthy time lag. The difference in water quantity and time lag could affect flow regimes.

Diagram of Typical Septic System



Source: GA DHR. 2002. A Homeowners Guide to On-site Sewage Management Systems

Septic Systems Statistics for Georgia:

- Currently, ~1.5 million housing units, or ~40% of houses, use septic systems, compared to the national average of 25% (West)
- It's estimated that ~50,000 houses are built using septic systems each year, which is ~50% of the total number of homes built annually (West)
- Current septic use in Georgia is estimated at 220 million gallons of water per day (EPD)
- Future septic use in Georgia is estimated to increase each year by 7.35 million gallons of water per day, a volume of water that could serve the indoor and outdoor water needs of an area serving 49,000 individuals. (EPD)
- Septic systems ingest ~1/4 of Metro Atlanta District's water supply (Shelton 2005)
- Gwinnett Co. has 92,000 septic systems, more than any county in Georgia (Frankston 2003). Nearly 30 million gallons of wastewater enter the soil daily in Gwinnett (Gwinnett Co. 2005)

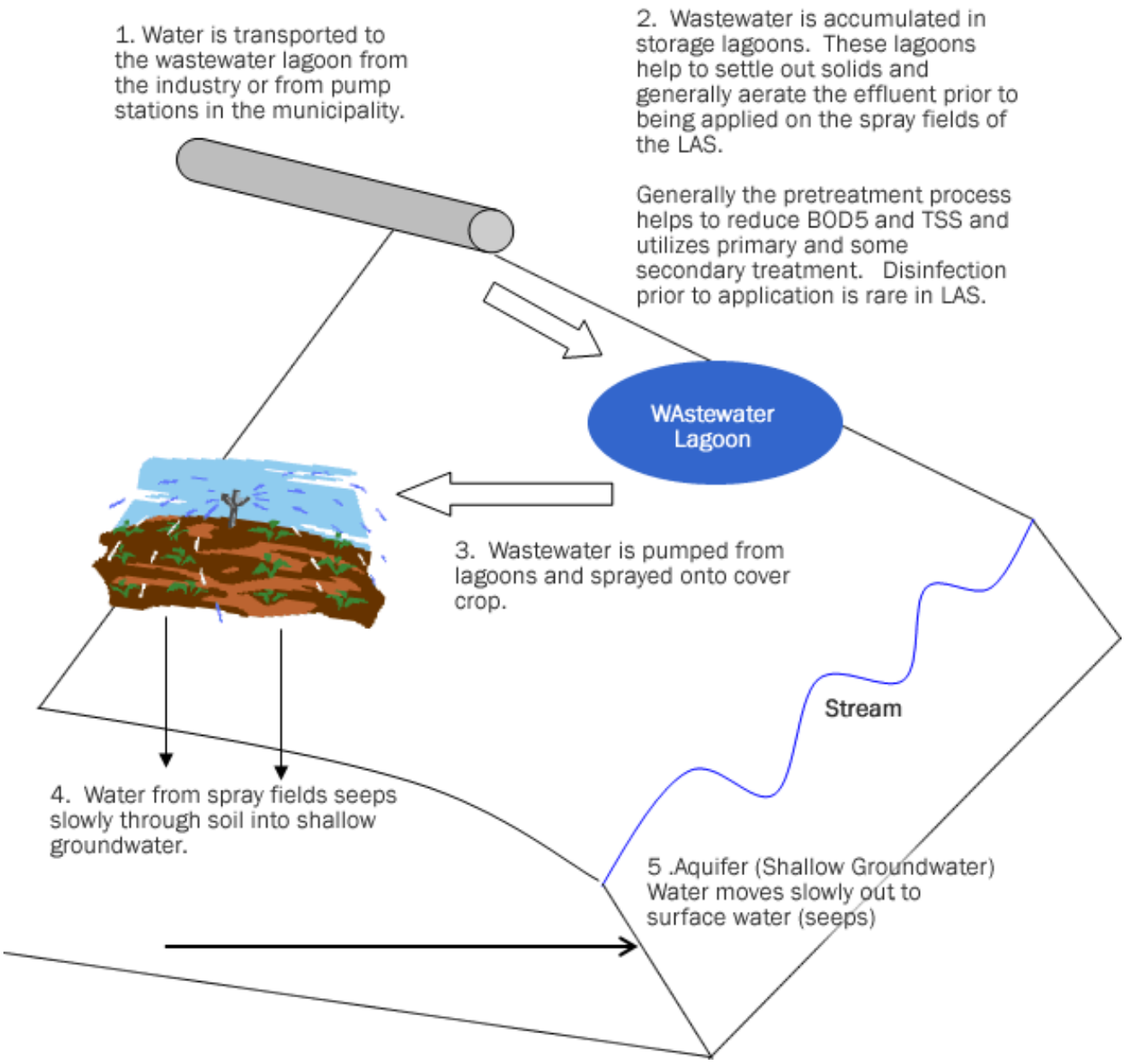
Land Application Systems

Land Application Systems (LAS) use the land to treat and recycle wastewater. In LAS, wastewater is first treated to remove solids and organic matter (primary and secondary treatment), and then applied to land where the soil filters nutrients, dissolved organics, and other contaminants. Over time, water seeps into groundwater or nearby surface water. LAS is beneficial for nonpotable uses, such as irrigation, wetlands restoration, groundwater recharge, commercial use, and industrial use.

From the standpoint of maximizing returns, when water is applied to land, it takes longer to return to the water source. Some of the water is consumed through evaporation and transpiration. The loss of water can result in lower stream flows. LAS can also contribute to nonpoint source pollution.

- Illustration of Land Application Systems
- List of LAS of at least 1 million gallons per day
- Map of LAS Sites in Georgia

Illustration of Land Application System (LAS)

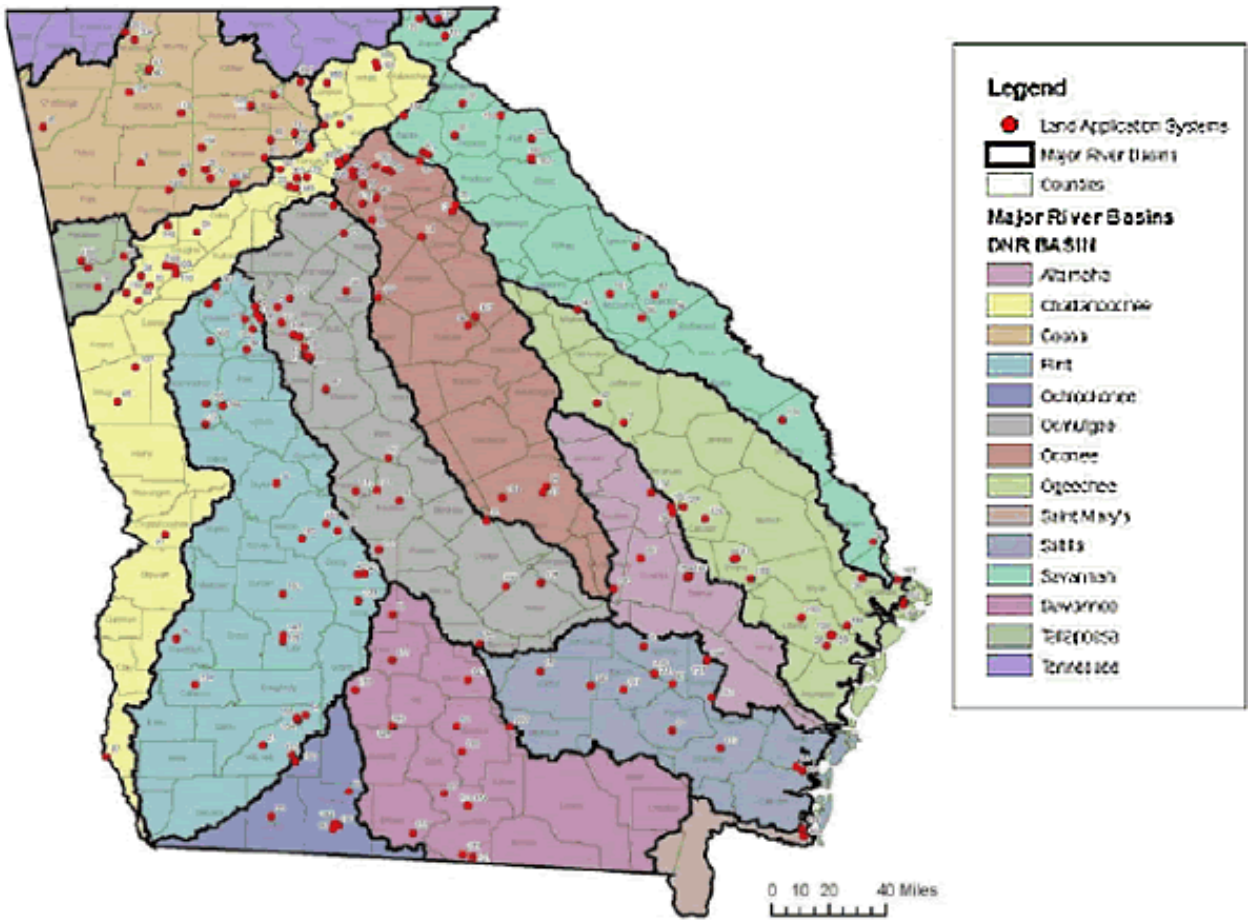


List of LAS of at least 1 million gallons per day (mgd)

Name	County	Flow (mgd)	River Basin	Total Basin LAS Permitted Flow (mgd)
Swainsboro LAS	Emanuel	1.86	Altamaha	3.66
Vidalia LAS	Toombs	1.8		
Forsyth Co. Fowler & James Cr. WRFS	Forsyth	1.25	Chattahoochee	1.25

Dalton Utilities	Whitfield	40	Coosa	44
Cherokee Co. WSA Rose Cr.	Cherokee	4		
Camilla LAS	Mitchell	3.1	Flint	7.45
Griffin Shoal LAS	Spalding	2.25		
Clayton Co. Shoal Cr.	Clayton	1.1		
Fairburn	Fulton	1		
Cairo LAS	Grady	2.5	Ochlockonee	4
Pelham LAS	Mitchell	1.5		
Covington	Newton	4.8	Ocmulgee	12.6
Winding River Development	Houston	2		
Henry Co. Walnut Creek Reclamation Facility	Henry	4		
Newton Co. Water & Sewage Authority	Newton	1.8		
Winder LAS	Barrow	1.65	Oconee	1.65
Skidaway Isl. Utilities	Chatham	1.25	Ogeechee	2.25
Metter	Candler	1		
Baxley LAS	Appling	1.4	Satilla	1.4
Savannah Reuse LAS	Chatham	2	Savannah	4.75
Hartwell LAS	Hart	1.75		
Effingham Co. South	Effingham	1		
Lowndes Co. South Lowndes Regional	Lowndes	2	Suwanee	5.68
Quitman	Brooks	1.5		
Sylvester LAS	Worth	1.18		
Nashville	Berrien	1		
Carrollton	Carroll	7	Tallapoosa	7
Clayton Co. Huie LAS	Clayton	19.5	Upper Ocmulgee	22.1
Henry Co. Indian Creek	Henry	1.5		
Henry Co. Springdale LAS	Henry	1.1		
			TOTAL	**117.79**

Land Application Systems Map



Source: Georgia EPD. 2006. Maximizing Returns BAC Discussion Packet.

MANAGEMENT OBJECTIVE #3:

Meeting Instream & Offstream Needs

The public meetings for this Management Objective begin late June.
Information will be posted soon. Please check back.

MANAGEMENT OBJECTIVE #4:

Protecting Water Quality

The public meetings for this Management Objective begin in August.
Information will be posted soon. Please check back.

Citizens Action Plan

Your input matters! Citizen participation in the water planning process is critical to having a plan that reflects the interests of a broad group of Georgians. EPD is providing opportunities for public involvement, so it is very important that you take advantage of them and have a voice in how Georgia's waters are managed.

This section addresses the following topics:

- Personal Action Plan for Getting Involved
- Strength in Numbers: Joining an Organized Effort
- Tips and Tools for Public Participation
- Contact Information
- Meeting Schedule

Personal Action Plan for Getting Involved

A good starting point is developing a checklist of activities that you will undertake. This list could be separated by time. For example, you could make a list of tasks with 3 separate categories: one for right now, one for the next six months, and one for the next year. See a Sample Personal Action Plan.

It's important to be realistic and select activities that you can and will do. You don't want to develop a large list that is difficult to accomplish because you will likely get overwhelmed and discouraged. Even choosing one activity can make a difference.

Here are examples of personal actions and helpful tips.

Steps to take now:

See the Sample Personal Action Plan

Join EPD's email list to receive information as items are posted on the official statewide water planning website

Frequently visit the Online Citizen's Guide

- New information will be posted as it is made available

Attend as many meetings as possible

- Including Water Council meetings, Statewide Advisory Committee meetings, Basin Advisory Committees meetings, and Town Hall meetings
- Meeting Schedule

Join an organized effort

- If you can't participate as much as you like, contribute money to help the organization of your choice

Steps to take as water planning recommendations are made public:

Closely examine the recommendations in the proposed plan

- Comment on recommendations that your particularly like and dislike
- Contact information for the people who need to hear your comments

Send e-mail or public comment about Georgia's Statewide Water Planning

Help spread the word about the planning recommendations by involving the media:

- Write to a newspaper, radio station, or TV station about issues
- Include issues that you like and dislike
- Media is a great way to disseminate basic information about the issues, explain significance of the plan and specific issues, and ways to participate

Plan to speak at a Water Council meeting or a Town Hall meeting

- All public meetings are open to the public
- Town Hall meetings are specifically for hearing public input on proposed recommendations
- Do your homework:
  - Research facts and prepare your statement in advance
- Use your own testimony:
  - Stick to your own personal, firsthand experiences
  - Be honest and accurate
- Recommend ways for resolving the issue:
  - How would you deal with it if you were the public official?

Phone, write, or visit your legislator or a Water Council member about an issue

- Remember: Reelection is a top priority for any elected official. Legislators have the ultimate decision-making authority for this water plan, and as few as 10 letters can have a huge impact on how a legislator votes! Your input matters!
- Individual letters usually get more traction than a petition signed by many people or an email. Most legislators will respond to a written letter.
- Stick to your own personal, firsthand experiences; use your own testimony

Arrange a local meeting on an issue that might negatively impact your community

Telephone friends and persuade them to act!

Strength in Numbers:

Joining an Organized Effort

Community groups function as pathways of recruitment for public participation. They can reduce costs associated with participation and increase the likelihood that action will be successful. It is easier to join a group than to participate individually, and individuals have a better chance of being heard when they organize in interest groups or coalitions and put pressure on decision makers.

An example of a coalition that is actively working on the statewide water planning process is the Georgia Water Coalition. The Georgia Water Coalition is a group of 131 organizations, associations, and businesses that have members from the following communities: conservation, business, recreational, academic, religious, hunting and fishing, agricultural, forest landowners, and homeowners' associations.

Actions for Organizations:

See the Sample Action Plan for Organizations

Use newsletters to keep members informed

- Newsletters can summarize critical planning issues, alert the public to take action, and provide a list of upcoming meetings or events

Organize media and letter writing campaign to Water Council and legislators

- The Water Council and the General Assembly have all decision-making authority

Tips and Tools for Public Participation

Tips:

Become involved early and stay active!

Seek expert advice

- There are many places to seek expert advice on water issues.
- Federal and state agencies have a great deal of information, and most of it can be accessed by the public.
- Universities are also a great resources. For example, the University of Georgia's River Basin Center and Carl Vinson Institute of Government have many online publications about water management issues that are written by scientists, economists, lawyers, and policy experts.

Getting information from EPD or other public agencies

- The Open Records Act gives Georgians the right to review information and data, such as permits and

contamination levels in water. Certain records are exempted from public disclosure, but the majority can be accessed. This applies to state agencies, cities, counties, and school districts.
- To access information: call or request in writing
- Try calling first – it's the quickest and easiest way. Some agencies require you to submit a request in writing, so call to find out.

Toolkit:

Writing Press Releases and Letters to the Editor

Effective press releases and letters to the editor are often published and can be very influential. Even if letters are not published, they let editors know what issues are important to readers and will likely incorporate coverage of that issue. Timing, content, and delivery are critical components of press releases and letters.

The following links will help you develop effective press releases and letters:

- Press Release Content Basics
- 10 Essential Tips to Writing Press Releases
- Press Release Template
- Tips for Writing Letters to the Editor
  (PDF download)

Speaking and Writing Letters to Public Officials

Speaking with and writing persuasive letters to public officials are useful and effective ways of reaching and establishing contacts.

The following links will help you speak or write to your public officials:

- 20/20 Vision's Tools for Citizens
- League of Women Voter's Tips for Contacting and Talking with Public Officials
  (PDF download)

Contact Information

Georgia EPD and The Water Council
2 Martin Luther King Jr. Drive
Suite 1152, East Tower
Atlanta, GA 30334
Telephone: 404.656.4713 or 888.373.5947 (toll-free throughout Georgia)
Email the Water Council (arnettia_murphy@gaepd.org)

General Assembly
All contact information available on General Assembly website

Send e-mail or public comment about Georgia's Statewide Water Planning (derrick_williams@dnr.state.ga.us)

Sample: Personal Action Plan

To do: NOW	Visit Online Citizen's Guide and EPD's website frequently and have an understanding of the water issues
	Attend a local BAC Meeting
To do: Within 6 months	Closely study proposed water planning policies as they are made public
	Plan to speak at a Town Hall meeting this summer
To do: Within 1 year	Plan to speak at a Water Council meeting and let them know about proposed policies I like and dislike
	If there are proposed policies that I really dislike that would negatively impact my community: • Send a Letter to the Editor • Write a letter or call my legislators and encourage friends to do the same

Sample: Action Plan for Organizations

To do: NOW	Encourage members to visit Online Citizen's Guide and EPD's website frequently and have an understanding of the water issues
	Put a link on my organization's website to the Online Citizen's Guide
	Start including regular articles about the Water Plan and planning process in my newsletter
	Encourage members attend a local BAC Meeting
To do: Within 6 months	Organize a meeting prior to the closet Town Hall meeting to explain the proposed policies
	Encourage a member to speak on the organization's behalf at a Town Hall meeting this summer
To do: Within 1 year	Encourage a member to speak at a Water Council meeting and let them know about proposed policies that our organization likes and dislikes
	If there are recommendations that we really dislike that would negatively impact our community: • Send a Letter to the Editor • Organize a media and letter writing campaign • Encourage members to contact their legislators

Additional Resources

Georgia Water Planning

Georgia EPD Statewide Water Planning
Georgia Water Council

Agencies with Water-Related Interests

Georgia Department of Community Affairs (DCA)
Georgia Department of Natural Resources (DNR)
-Coastal Resources Division
-Environmental Protection Division
-Pollution Prevention & Assistance Division
-Wildlife Resources
Georgia Environmental Facilities Authority (GEFA)
Georgia Soil and Water Conservation Commission (SWCC)
U.S. Environmental Protection Agency, Water
USGS Georgia Water Science Center

Regional Initiatives

Metropolitan North Georgia Water Planning District
Northwest Georgia Regional Water Resources Partnership
Flint River Basin Plan
Coastal Sound Science Initiative

Riverkeepers

Altamaha Riverkeeper
Chattahoochee Riverkeeper
Coosa River Basin Initiative
Ocmulgee Riverkeeper
Ogeechee-Canoochee Riverkeeper
Satilla Riverkeeper
Savannah Riverkeeper
Upper Chattahoochee Riverkeeper

Academic

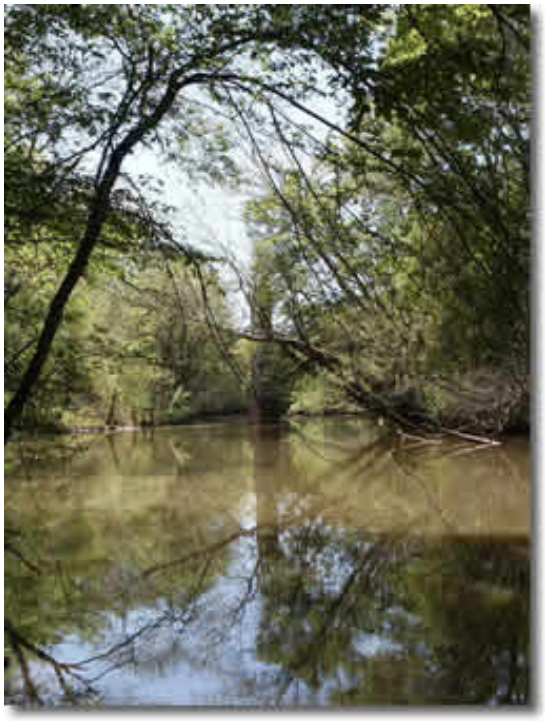
UGA River Basin Center
UGA Carl Vinson Institute of Government, Environmental Program

Statewide Nongovernmental Organizations

Association of County Commissioners of Georgia
The Garden Club of Georgia, Inc
Georgia Agribusiness Council
Georgia Agricultural Commodity Commission for Peanuts
Georgia Association of Water Professionals (formerly GW&PCA)
Georgia Chapter of the American Water Resources Association (GA WRA)
Georgia Conservancy
Georgia Environmental Council
Georgia Farm Bureau
Georgia Golf Course Superintendents Association
Georgia Municipal Association
Georgia Public Policy Foundation
Georgia River Network
Georgia Water Coalition
Georgia Water Wise Council
Georgia Wildlife Federation
The Nature Conservancy, Georgia Chapter
Plumbing & Mechanical Association of Georgia
Sierra Club, Georgia Chapter
Southern Alliance for Clean Energy
Southface

If you would like to add your organization to this list of contacts, click here to send an email.

Please Provide Us With Feedback!



Name:

Email:

How did you find the website?

Did you find this guide useful? **Yes** ○ **No** ○

Would you like us to contact you with more information?
Yes ○ **No** ○

Please provide suggestions for ways to improve this website:

Send Clear

Acknowledgements

Special thanks to the following organizations for their input into this website.

- **Georgia Wildlife Federation**
- **UGA River Basin Center**

- Athens Land Trust
- Coosa River Basin Initiative
- Ens & Outs, Unitarian Universalist Congregation of Atlanta
- Garden Club of Georgia
- Georgia Forestry Association
- Georgia ForestWatch
- Georgia River Network
- Georgia PIRG
- Ogeechee-Canoochee Riverkeeper
- Satilla Riverkeeper
- Sustainable Business Partners
- The Rain Harvest Company, Inc.
- Trout Unlimited, Georgia Chapter

Glossary of Water-related Terms

a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w | x | y | z

acre-foot: amount of water that would cover an acre of land to a level of one foot in depth; 325,851 gallons

aquifer: a geologic formation that contains sufficient saturated materials to be capable of storing water and transmitting water to a well

aquifer storage and recovery (ASR): the intentional addition of water to an aquifer through direct injection

baseline data/ information: starting point

basin-of-origin: river basin where water is withdrawn from for an interbasin transfer

basin-of-receipt (or receiving basin): river basin that receives the water in an interbasin transfer

best management practices (BMPs): a collection of methods, procedures, techniques, or use of technology that are widely accepted as beneficial in achieving specific or general goals

commercial (or institutional) water use: water used for motels, restaurants, office buildings, and other commercial facilities and institutions; The water may be obtained from a public water supply or may be self supplied.

conservation measures/ practices: specific activities and programs to be implemented by water users, water managers, state officials, and/or water providers

conservation pricing: any of a variety of rate structures for water pricing that encourages customers to reduce water use

conservation targets: goals for reducing water waste, loss, and/or use

consumptive water use: water use that results in a reduction in the amount of water from its withdrawal point to its discharge point, usually as a result of evaporation or use of the water by crops or products; Georgia EPD considers agricultural irrigation 100% consumptive

demand management: mechanisms generally implemented by governments or utilities to reduce water demand

declining (or decreasing) block rate: tiered rate structure for water pricing in which the lowest tier of use has the highest cost per gallon and the highest tier of use has the lowest cost per gallon

discharge point: location at which effluent is released after use into a receiving stream or infiltration bed

distribution: process of conveying water from a water supplier's points of withdrawal or treatment through the distribution system to the user or another water supplier. Water is "released" from the public water supplier into the distribution system and "delivered" to users.

diversion: point of withdrawal from surface water

drainage basin: an area of land where all surface water drains to a particular river or stream

effluent: water, wastewater, or other liquid that has been collected for treatment

end use: the place where water is being used; Single-family residences, multi-family residences, public parks or recreation areas, and industries are examples are end users

evapotranspiration: the collective loss of water through transpiration from plants and evaporation from land and water surfaces

flat rate: rate structure for water pricing that is the same for each customer, regardless of the amount of water used; the price per gallon decreases as consumption increases

floodplain: area of land along the margins of rivers and streams that is covered with water when the river or stream floods; Floodplain soils typically consist of sediments deposited by floods.

flow regime: rate of water flow past a given point in a stream over any 12-month period of time; usually measured in cubic feet per second (cfs) or million gallons per day (mgd)

gpd: gallons per day; a standard measurement of water withdrawal and use

gpcd: gallons per capita per day; measurement of how individuals and households are using water on a daily basis and generally where potable water is being used

gray water: untreated water from sinks, dishwashers, or clothes washers in households or small businesses. Gray water may be used for irrigation or certain industrial purposes

groundwater: water under the surface of the earth in a saturated geologic structure. Groundwater does not include water flowing in underground streams with ascertainable beds and banks

groundwater mining: overpumping (or overdrafting) groundwater such that withdrawals exceed recharge over time

household (or residential, domestic) water use: water for household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens; includes single and multi-family dwellings

hydrology: science of water, including the study of the properties, distribution, and effects of water on the earth's surface

- **impervious**: surface through which water cannot pass. Roads, driveways, parking lots, and buildings create impervious surfaces in watersheds.

in-house efficiency: improving the way water is used in homes, factories, businesses, and other end uses for non-discretionary purposes

inclining (or increasing) block rate: tiered structure for water pricing in which the lowest tier of use has the lowest cost per gallon and the highest tier of use has the highest cost per gallon

industrial use: a non-irrigation use of water not supplied by a city, town, or private water company, including animal industry use

information targets: targets that enhance understanding about water use and conservation efforts

instream flow: water in rivers and streams. Certain levels of flow are required for aquatic habitat, recreation, navigation, and waste assimilation

instream use: water that is used, but not withdrawn, from a surface-water source, or a groundwater source, for hydroelectric-power generation, navigation, water quality improvement or waste assimilation, fish propagation, wildlife preservation, recreation, and ecosystem maintenance, which includes freshwater circulation to estuaries and maintenance of riparian vegetation and floodplain wetlands

interbasin transfer: movement of water across a river basin divide or drainage; see basin-of-origin; basin-of-receipt

irrigation water use: artificial application of water on lands to assist in the growth of crops or pasture including in greenhouses. Irrigation water use may also include application of water to maintain vegetative growth in recreational lands such as parks and golf courses.

- **municipal use**: non-irrigation uses of water supplied by a city, town, or private utility
- **nonpoint source pollution**: pollution originating from diffuse water sources rather than a single location such as a pipe. Polluted runoff from roads, fields, or lawns is a type of nonpoint source pollution.
- **offstream uses**: water withdrawn or diverted from a source and transported to a place of use; includes public supply, commercial, industrial, mining, irrigation, and thermoelectric
- **peak (water) demand**: the point(s) of greatest water use experienced by a water supply system. Peaks can be measured daily, monthly, and annually

per capita (water) use: the amount of water used by one person, usually expressed in terms of per capita per day (pcd), or how much water one person uses in one day

permitted capacity: the total amount of water use allowed by a sector or an individual withdrawal

potable water: water that is suitable for drinking, cooking, and household needs

pressure reducer (or regulator): a device used to reduce the water pressure in a water transmission pipe

public wastewater system: wastewater collected from users or groups of users, conveyed to a wastewater treatment plant and released as return flow into the hydrologic environment or sent back to users as reclaimed wastewater

public water system: water withdrawn by public and private water systems and delivered to users or groups of users. Public water systems provide water for a variety of uses, such as domestic, commercial, industrial, thermoelectric power, and public water use

rain sensor: a device that automatically shuts off an irrigation systems in the event of a rain event

recharge: the natural or artificial (intentional) addition of water to an aquifer

reclaimed water: wastewater that has received treatment to urban water reuse standards and meets specified treatment criteria. Reclaimed water is generally treated to non-potable standards.

release: water discharged by a user or group of users into a wastewater-collection system

reuse: the beneficial use of previously used and treated water (reclaimed wastewater) as a substitute for another generally higher quality water source. Direct reuse is the use of treated water before it is disposed or discharged into a watercourse, lake, or other body of water. Indirect reuse uses a watercourse or body of water for transport of return flows as part of a reuse project.

reuse feasibility studies: assessments of the feasibility of using reclaimed water to help minimize water withdrawals

riparian: of or situated on the banks of a river or stream. Pertaining to anything connected with or immediately adjacent to a river or stream.

runoff: portion of rainfall that flows along the surface of the land. The amount of water that becomes runoff varies with topography, soils, and geology.

safe allowable consumptive use: the amount of water that can be consumed to the extent that present and future instream needs and offstream demands downstream of the use area are met

safe yield: the maximum amount of surface or groundwater that can be withdrawn over time without damaging the resource; or, the amount of groundwater that can be withdrawn without exceeding the recharge rate

saltwater intrusion (or encroachment): the movement of saline water into a fresh groundwater or surface water body

seasonal rate: rate structure for water pricing in which the price per gallon of is uniformly higher during periods of peak seasonal demand, typically during the summer months due to landscape irrigation. Rates during the remaining months of the year are uniform

seasonal surcharges: excess-use charges added to the base water rate during peak water use periods

septic system: refers to a buried tank for the separation in the absence of oxygen of solids, grease, and liquid components of wastewater. The liquid fraction from the septic tank is discharged to a drain field for disposal.

sliding scale: used to demonstrate the relationship between the characteristics of a water resource and some measure of response from those using the resource

source management: the amount of water we take from a water body and the amount used for specific purposes

submeter: a water meter that measures unit water use within a larger service connection, such as a process within an industrial facility or an apartment within a larger complex

subsidence: the settling or lowering of the surface of the land which may result from the overdraft of groundwater

surface water: floodwater and waters flowing in streams, ravines, defined underground channels, and water in lakes, ponds, and springs on the surfaces

transpiration: the loss of water through a membrane or pores of a living organism (plant)

toilet displacement device: a device (typically a brick, bottle, or bag) used to displace water in a toilet tank in order to reduce the volume used for flushing

unaccounted-for water: water that is treated for delivery by a water utility but not billed (water that is lost by leakage, theft, or is unmetered)

uniform rate: rate structure for water pricing in which the rates are the same for all customers and all levels of consumption: the per-gallon price of water remains constant

unmetered water: water that is delivered by a water utility but not measured for billing

wastewater: used water or drainage from homes, businesses, industries, and institutions

wastewater collection: process of conveying wastewater form users through a wastewater-collection system (sewer system) to a wastewater-treatment facility. Wastewater is released by the user into the collection system and received by the treatment facility.

wastewater treatment: the processing of wastewater for the removal or reduction of contained solids or other undesirable constituents

water audit: an onsite assessment of water use, including hardware and equipment that uses or delivers water, landscaping and water management practices, and other factors, for the purpose of assessing the potential for improving water use efficiency

water banking: a method for allocating currently unused water to future water needs

water budget: a water allocation based on established water efficiency standards. Water budgets may be established for agricultural, industrial, and other uses.

water conservation: beneficial reduction in water use, water waste, and/or water loss

water conservation goals: specific or programmatic goals, under the water conservation management objectives, that all water users can work toward to reduce water usage

water conservation practices: specific activities and measures to be implemented by water users, water managers, state officials, or water providers

water conservation targets: goals for reducing water waste, loss, and/or use

water consumption: water use that results in a reduction in the amount of water from its withdrawal point to its discharge point

water efficiency: achieving a water use function with the minimal amount of water possible

water reclamation: the treatment of wastewater to make it reusable, generally for nonpotable purposes

water reuse: the beneficial use of previously used and treated water (reclaimed wastewater) as a substitute for another generally higher quality water source. Direct reuse is the use of treated water before it is disposed

or discharged into a watercourse, lake, or other body of water. Indirect reuse uses a watercourse or body of water for transport of return flows as part of a reuse project.

water supply: all of the processes that are involved in obtaining water for the user before use; includes withdrawal, water treatment, and distribution

water transfer: artificial movement of water from one area to another

water use: (1) water actually used or consumed for a specific purpose, such as for domestic use, irrigation, or industrial processing; (2) more broadly, water use pertains to human interaction with and influence on the hydrologic cycle, and includes elements such as water withdrawal, distribution, consumptive use, wastewater collection, and return flow

water use and conservation profiles: used to account for statewide water usage and to estimate potential water savings from standard water conservation practices

water withdrawal: water taken from a natural or manmade water body

watershed: an area of land from which water drains into a particular stream or river. The total area of land above a given point on a river or stream that contributes surface water flow at that point.

well: a manmade opening in the earth through which water may be withdrawn or obtained from beneath the surface of the earth, with certain exceptions

withdrawal: removal of surface or groundwater from the natural hydrologic system for use, including public water supply, industry, commercial, household, irrigation, livestock, thermoelectric power generation, and water uses

Xeriscape™: a trademarked term used to describe the selection, planting, and care of low-water-use landscape plants, shrubs, and trees