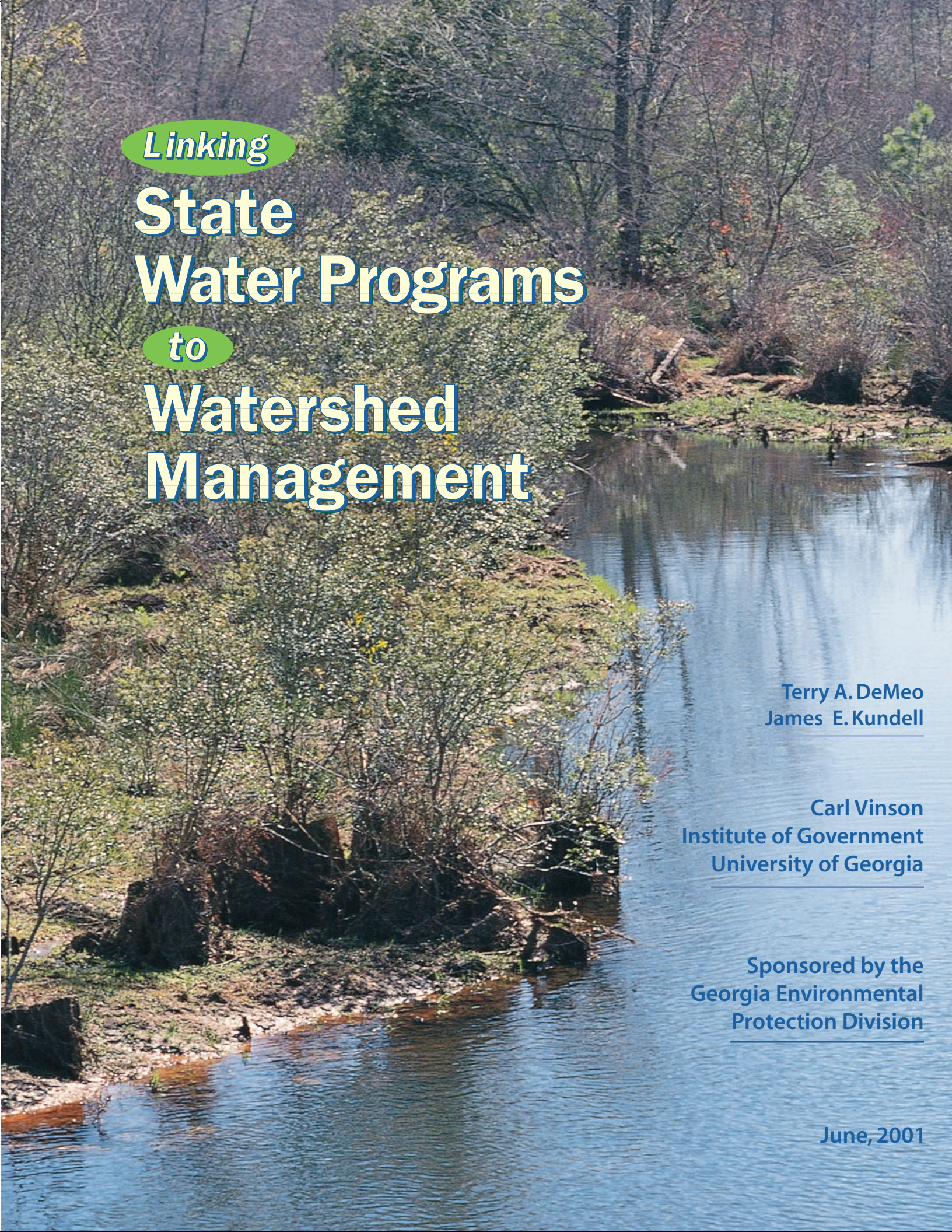

Linking State Water Programs to Watershed Management

Terry A. DeMeo
James E. Kundell

Carl Vinson
Institute of Government
University of Georgia

Sponsored by the
Georgia Environmental
Protection Division

June, 2001

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Editing: Inge Whittle
Design and production: Reid McCallister
Digital composition and layout: Lisa Carson
Proofreading: Norma Pettigrew
Publications manager: Joycelyn Trigg

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Foreword

Water resource decisions have traditionally been made to meet the specific objectives of individual programs. And water resource responsibilities have been implemented within the geographic confines of separate jurisdictions. In the physical world, however, water resource issues are linked to the geographic boundaries of the watershed; upstream actions affect the quantity and quality of downstream water resources.

Across the nation, the watershed concept is recognized as the most effective approach to managing and protecting water resources in the 21st century. Georgia water resource agencies have begun requiring the use of a watershed approach to meet the objectives of some state water programs and are encouraging the approach in others. This change of direction represents a challenging point in water management: moving from the previous sole program perspective to an integrated watershed approach.

This guidebook was developed to help in the transition toward a comprehensive watershed management approach. It provides guidance on integrating regulatory program objectives to meet increasingly frequent requirements, realize cost-efficiencies, and protect the state's waters from contamination. The guidebook describes a new and innovative way to help local governments achieve these objectives: the One-Stop Watershed Management Conference. In a face-to-face meeting with representatives of state water programs, local governments can design a watershed management program that addresses their specific needs and opportunities and also begins to coordinate actions within the watershed.

The authors of this work are Terry A. DeMeo, environmental policy specialist at the Carl Vinson Institute of Government, the University of Georgia; and Dr. James E. Kundell, senior public service associate at the Institute and policy director of the River Basin Science and Policy Center, the University of Georgia, who also serves as science advisor to the Georgia General Assembly.

Scientific understanding of water resource issues has increased exponentially over the last 40 years. Now we face the challenge of putting the pieces together into an integrated whole that achieves the greatest return on investment. We hope this guidebook contributes to a better understanding of the challenge and the approaches for its resolution.

Dr. C.R. (Mike) Swanson
Interim Director
June 2001

Preface

As they carry out their responsibilities, state water program managers have frequent contact with local government officials and water and wastewater permit holders. And, in the past few years, they have received two messages with increasing frequency:

- The regulated community is confused by state water programs that have similar but not the same requirements for a watershed approach.
- Local governments are frustrated by the fact that meeting the watershed requirements of one program does not guarantee satisfying the requirements of other water programs.

Responding to these messages, state water program managers with the Environmental Protection Division (EPD), Department of Community Affairs (DCA), and Department of Human Resources (DHR) began a process of identifying problems and exploring solutions. This process focused on enhancing communication, coordination, and integration among the water programs to meet three objectives:

- Administer each water program to meet all state programmatic requirements.
- Support local officials and others in the regulated community to help them meet multiple state program requirements.
- Support the state's river basin and watershed management approach.

The water program managers and a project team met seven times over a nine-month period and identified several strategies to meet these objectives. One strategy led to the development of this guidebook. A second is the concept of a One-Stop Watershed Management Conference (described in this guidebook). At the conference, the local government applicant and representatives of water programs would sit down together and identify the components of an integrated watershed management approach that links program requirements in order to reduce redundancies and increase cost-effectiveness. A third strategy involves establishing watershed coordinators who would become centralized sources of information on state water program requirements and issues and activities within the watershed.

The state water program managers who committed time and energy to this coordination process include the following:

Nap Caldwell, Water Resources Management, EPD

Larry Hedges, Nonpoint Source Program, EPD

Bill McLemore, Geologic Survey Branch, EPD
Deborah Miness, Office of Coordinated Planning, DCA
Clint Moye, TMDL Program, EPD
Steve Payne, Source Water Assessment and Protection Program, EPD
Bob Scott, Engineering and Technical Support, EPD
Scott Uhlich, Sewage Disposal Program, DHR
Ed Urheim, Drinking Water Permitting and Engineering, EPD
Mork Winn, Watershed Planning and Monitoring, EPD

The project team that coordinated the process includes Jim Kundell, Terry DeMeo, Deanna Ruffer, and Gail Cowie.

Introduction

Georgia manages water resources through programs that administer federal and state water laws and that satisfy state planning, health, and wildlife protection requirements. These federal and state laws were passed at different times and have different objectives, time requirements, data needs, and so forth. One of the greatest challenges facing local governments is integrating the multiple program requirements and planning processes to plan for and manage water resources.

The watershed concept is recognized as the most effective approach to managing and protecting water resources in the 21st century. It offers the best opportunity to seek and implement comprehensive solutions that are effective, efficient, and flexible. The watershed approach can help develop the information needed for informed local decision making and help build the local agreement that will support economic growth, promote water availability and quality, and protect fisheries and the health of the natural environment.

The Georgia Environmental Protection Division (EPD) takes the lead role in the state's water resource programs, but the Department of Community Affairs (DCA) and the Department of Human Resources (DHR) also administer water-related programs. EPD, like environmental agencies nationwide, has made a commitment to adopt the river basin or watershed concept to manage and protect water resources. Consequently more state water programs have begun including local governments in the watershed process by requiring permit holders to undertake a watershed management approach to satisfy water protection and planning requirements. This is not a new regulatory program but rather a strategic concept for applying existing programs more efficiently and effectively on a watershed level.

Purpose of the Guidebook

The purpose of this guidebook is twofold:

1. To reduce confusion about state water programs that have similar but not the same water protection and planning requirements.
2. To show where the programs can be linked to bring the protection and planning activities together into one watershed approach.

The first section of the guidebook provides general information on watersheds, watershed management, and water quality. It presents sev-

eral strong reasons for local governments to consider using a watershed management approach.

The second section briefly describes three types of state water programs:

- *Locally required*—those that require some sort of local watershed management activities.
- *State-initiated*—those the state is initiating but that also have a role for local watershed management activities.
- *Watershed-related*—those that can enhance local watershed management efforts or are indirectly related to the first two types.

The descriptions were designed as stand-alone overviews of the most important information on state water programs that are related to watershed management.

The third section of the guidebook shows where there are opportunities for linking state water program objectives and activities through a single watershed approach. It recommends the One-Stop Watershed Management Conference, a meeting with representatives of state water programs and the regulated community, as an innovative way to design a local watershed management program that meets multiple program requirements. This section also provides general guidance on the components of a comprehensive and integrated watershed management program.

The first step in implementing watershed-based water management is understanding what a watershed is, how it works and what part the local government and/or regulated community play in the watershed. Once this is established, the impact of pollution sources on water quality is more easily understood, and the strategies necessary to meet local government responsibilities for providing the public with clean safe water become more evident.

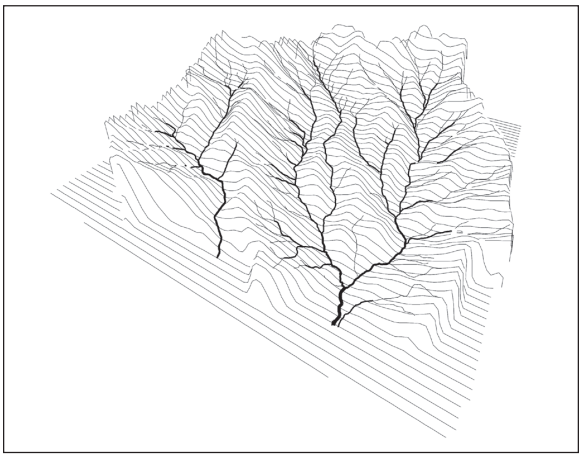


Figure 1.
Watershed Perspective Showing High-Elevation Ridge and Drainage Patterns (Coweeta and Dryman Fork Basins)

Coweeta LTER, University of Georgia, 2000

What Is a Watershed?

A watershed is the area of land where rain or snow melt drains to a single stream, river, or lake. A watershed is like a bowl or cup. The lip of the cup (or watershed boundary) is the high-elevation ridge that causes water to drain into one watershed or another (figure 1).

Watersheds come in all shapes and sizes. A watershed can be a small area of land (a few acres) that drains to one tiny creek, or it can combine several small watersheds (hundreds of square miles) that drain

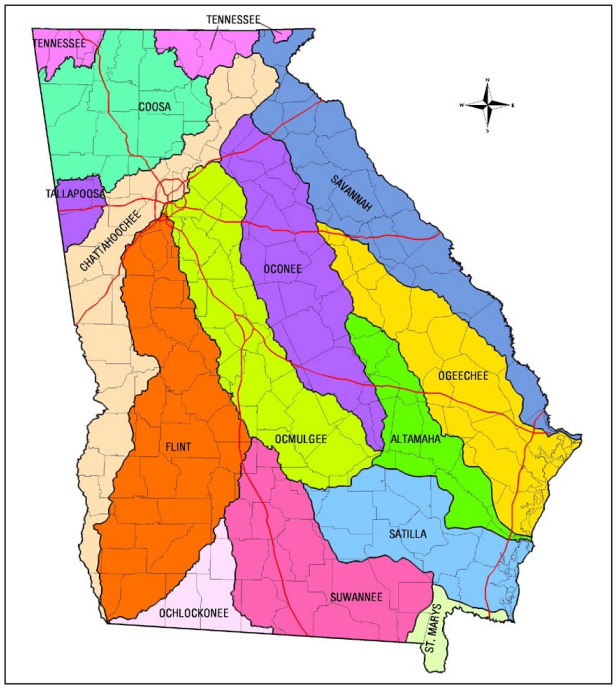
to a larger stream. River basins are larger areas of land that include many watersheds nested within its high-elevation ridge. All of the watersheds within a river basin eventually drain to the same river, lake, sea, or ocean.

Georgia has 14 major river basins that drain 70,150 miles of rivers and streams (figure 2). These 14 river basins are divided into 52 major watersheds (figure 3).

River basins and watersheds have names and number designations that are based on a hydrologic unit code (HUC). The HUC, also known as the river basin or watershed address, can range from 2 to 16 digits. The larger the HUC number, the smaller the watershed. For instance, the watersheds in figure 3 were delineated (mapped) at an 8 HUC scale. Maps of watersheds at a 12-digit HUC scale—the level at which, in many cases, the most effective water resource management and protection occurs—will be available in fall 2001.

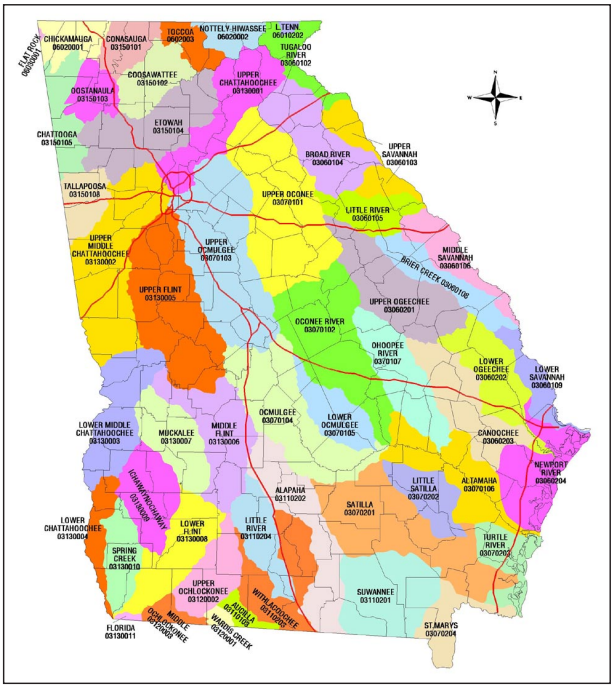
The area of land in a river basin or a watershed does not correspond to political boundaries. For instance, each of the 14 river basins cover parts of many counties, and most of the 52 watersheds cover parts of three or more counties and include a number of cities. But, regardless of location, every area of the state falls within at least 1 designated watershed and 1 river basin.

Figure 2. Georgia's 14 River Basins



Geologic Survey Branch, EPD

Figure 3. Georgia's 52 Major Watersheds



Geologic Survey Branch, EPD

Watershed management is complicated by the fact that the term *watershed* is used differently for different state water programs. For drinking water purposes, the watershed focus is on the land area upstream from the water intake. For wastewater purposes, the watershed area is the drainage basin of the existing and future service areas of the wastewater treatment plant. State water program requirements may apply to one of the HUC-defined watershed areas, a service delivery area, or jurisdictional boundaries.

One of the key challenges of watershed management is to develop collaborative and comprehensive approaches that work across jurisdictional boundaries and program requirements.

The important thing to remember is that water resource issues such as water supply, water quality, fish habitat, and environmental health are closely linked within watersheds. What happens in an upstream section of the watershed or river basin affects what happens downstream. One of the key challenges of watershed management is to develop collaborative and comprehensive approaches that work across jurisdictional boundaries and program requirements.

What Is Watershed Management?

Watershed management is the process of intentionally applying technical, political, and economic tools for the use, protection, and/or restoration of all of the water resources within the entire land area of a watershed. It integrates water supply, wastewater discharge, nonpoint runoff, groundwater and surface water conditions, and program requirements into a common approach for conducting planning, monitoring and analysis, and management and protection activities. This process differs from the traditional approach of managing on a program-, jurisdiction-, or ownership-specific basis. In contrast, the watershed management approach is based on

- a geographic focus on the water and land resources within the watershed,
- stakeholder involvement and partnerships with multiple agencies and other watershed jurisdictions, and
- continuous improvement to the watershed management program based on sound science.

A typical watershed management program has six integrated components: (1) project management, (2) stakeholder involvement, (3) watershed assessment, (4) watershed management plan development, (5) implementation of protection measures, and (6) monitoring results and program improvement (figure 4). Activities within each of these components are described in section 3. It is important to remember that watershed management goes beyond watershed assessment and planning

to actual implementation of protection actions and measurement of the success of those actions.

Watershed management activities are often undertaken to accomplish one or more of the following water quality objectives:

- To protect aquifers, streams, rivers, lakes, and wetlands from becoming contaminated or degraded.
- To maintain the current water quality of aquifers, streams, rivers, lakes, and wetlands.
- To restore aquifers, streams, rivers, lakes, and wetlands to an improved state of water quality.

Water Quality Standards

Georgia measures water quality using water-use classifications and water quality standards. All of Georgia's waters are classified for uses such as fishing, recreation, drinking water, wild river, scenic river, or coastal fishing. For each water-use classification, number-based standards establish the minimum safe level for that use.

Measuring water quality through a statewide monitoring program helps determine whether a body of water meets its standards. Monitoring combines physical, chemical, and biological measurements. The state's surface water monitoring program samples surface water and fish tissue for toxic substances; assesses point source effluent discharges and fish community structures; and monitors major lakes, biological communities, and facility compliance. The state's groundwater monitoring program measures trends in groundwater quality, samples public drinking water wells and groundwater at regulated facilities, and conducts specific studies on groundwater issues.

The water quality data from the statewide monitoring program and other sources help determine compliance with water quality standards,

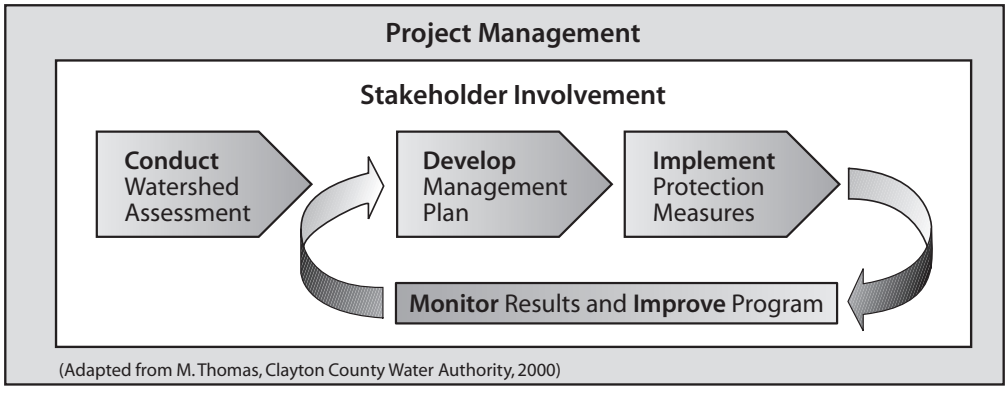


Figure 4. Typical Watershed Management Program with Six Integrated Components

determine degree of support of designated uses, and identify waters that have current or potential water quality impairment. Georgia is required to place waters that do not meet water quality standards and are not fully supporting their designated use on the federal Clean Water Act 305(b) list. Impaired water segments on the 305(b) list that do not have an identified recovery strategy leading to the attainment of water quality standards within two years are placed on the federal Clean Water Act 303(d) list (a subset of the 305(b) list). The descriptive and numeric water quality standards are the ruler that measures water quality health and violations. The 305(b) and 303(d) lists act as a report card that indicates water quality improvement or deterioration.

The descriptive and numeric water quality standards are the ruler that measures water quality health and violations. The 305(b) and 303(d) lists act as a report card that indicates water quality improvement or deterioration.

Reasons to Use a Watershed Management Approach

All of Georgia's 14 river basins contain some part of aquifers, streams, rivers, and/or lakes that do not meet water quality standards (figure 5). Point sources of pollution (discharges of local government and industrial wastewater) located along water bodies used to be the primary reason for most water quality violations. Today, however, the largest impacts on streams, rivers, and lakes (but not aquifers) result from nonpoint sources of pollution located within the entire watershed. Nonpoint sources of pollution (runoff from paved areas, fields, and lawns) are now the origin of over half of the pollutants entering the state's waters. Georgia's strategies to reduce water pollution have shifted from controlling only point sources of pollution to a broader watershed approach that addresses water quality impairments from both point and nonpoint sources.

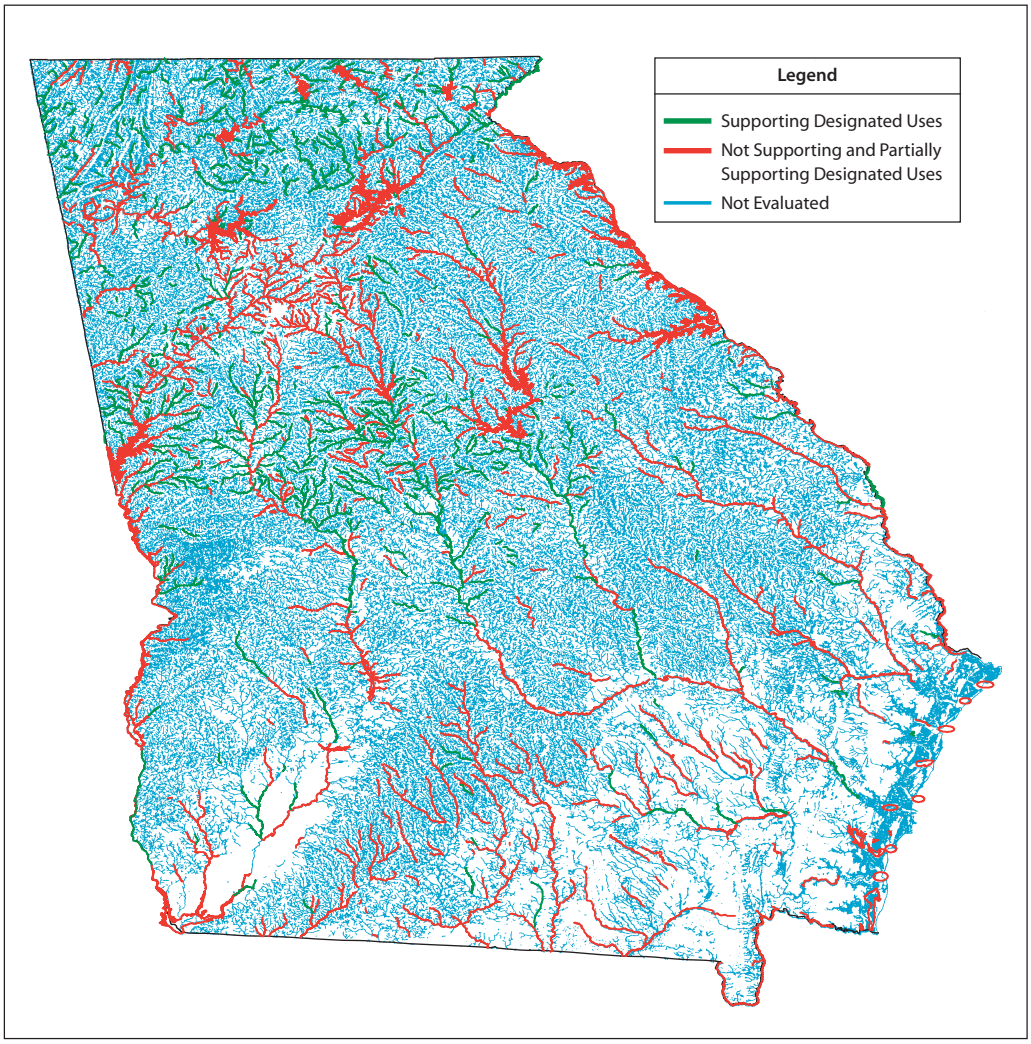
The three types of state water programs (those that require local watershed activities, involve state-initiated watershed activities, or support local watershed management) provide strategies to protect existing water quality and return polluted water bodies to water quality standards. Because there are streams, rivers, and lakes across the state that do not meet water quality standards, state water programs are beginning to apply a watershed approach to water management. In addition to increasingly frequent requirements for a watershed management approach in the state water programs, watershed management can increase cost-efficiencies in meeting water quality standards and protecting public health, safety, and welfare.

To Meet Watershed Management Requirements

Several state water programs now have watershed-related management requirements that local governments and others in the regulated com-

munity must meet. Some state programs require local watershed management activities, some are state-initiated but also have a role for local activities, and others can enhance local watershed management efforts. Various circumstances can result in *locally required* watershed assessments, protection plans, and/or protection programs:

- When a local government chooses to protect its water supply watershed with an alternative approach to the environmental planning criteria required in local comprehensive plans.
- When a local government, due to growth and development, needs to increase the hydraulic capacity of an existing water pollution control plant or proposes a new water pollution control plant requiring a wastewater permit or permit change.



Institute of Ecology, Natural Resources Spatial Analysis Lab (NRSAL), University of Georgia, June 2001

Figure 5.
State of Georgia 305(b)/303(d) Listed Water Bodies

- When a local government fits the criteria established under the 1999 federal Phase II Storm Water Program that requires development and approval of a local storm water management program by 2003.
- When river basin planning conducted by EPD indicates a problem in a specific watershed.

State-initiated watershed activities are conducted in the following situations:

- When a river basin management plan is developed or updated to link water resource issues and solutions in the basin.
- When a water segment appears on the 303(d) list because water quality standards are being violated and a total maximum daily load (TMDL) must be developed for the specific chemical or condition that caused the water body to violate water quality standards.
- When conducting a source water assessment and/or wellhead protection plan for drinking water systems (required by 2003) to identify potential sources of contamination of drinking water supplies.

Watershed-related state water programs or local circumstances that support the development of local watershed management programs include the following:

- When a local government, due to growth and development, needs to increase the withdrawal and treatment capacity of existing public surface water and/or groundwater supply systems or proposes a new public surface water or groundwater supply system and requires a water withdrawal permit and/or a drinking water permit.
- When the area is experiencing significant growth and needs to develop an erosion and sedimentation control plan to protect the water resources, even if no permits are required.
- When a jurisdiction is located in a flood-prone area of the state and finds that a floodplain management program will help safeguard life and property and meet storm water control objectives.
- When a jurisdiction has been notified that it is located within the watershed of another jurisdiction's water supply and is being asked to implement watershed protection measures, or a proposed regional reservoir requires cooperative multijurisdictional arrangements to ensure the protection of the watershed.

Increasingly, local governments must undertake a watershed management approach to meet program requirements for watershed assessments and protection plans. This approach places a greater emphasis on the resource itself and the achievement of water quality results rather than on administrative requirements. It helps provide the regulated community with a better understanding of water resource priorities for a given geographic area and how local government, industrial, and land use practices relate to those priorities. Local governments have authority over local land use practices and are responsible for streams, rivers, lakes, wetlands, and estuaries within their political jurisdictions. The bottom line is that water quality should be as good when water leaves the community as when it entered the community.

The bottom line is that water quality should be as good when water leaves the community as when it entered the community.

To Increase Cost-Effectiveness and Reduce Redundancies

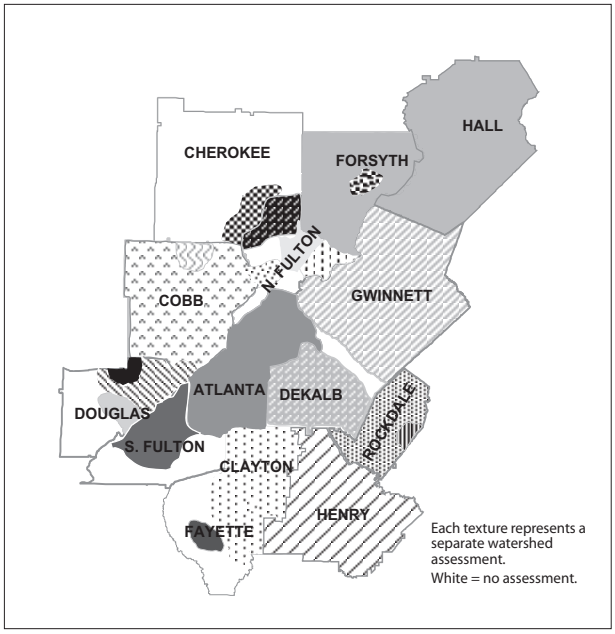
When a local government is faced with one of the watershed-related circumstances described in the previous section, it is often tempting to aim at meeting a minimum requirement to secure a permit or program approval. But, often this single-requirement approach is soon followed by having to undertake very similar watershed studies and activities to meet other permit or program requirements. Meeting multiple regulatory requirements through the use of a comprehensive watershed management approach can be more efficient and effective.

Meeting multiple regulatory requirements through the use of a comprehensive watershed management approach can be more efficient and effective.

Local governments can increase the cost-effectiveness of watershed studies and reduce duplication in two ways. The first way is to combine the current and near future requirements of all applicable programs into a multiple program approach. Much of the same kind of data must be collected for each of the different programs, whether it is permit driven, state initiated, or supportive of local watershed management. Sharing data among multiple programs is cost-effective because data collection is a major expense in watershed studies. By broadening the geographic scope slightly or by collecting a little more information, program requirements can be combined into one effort that eliminates duplicative fieldwork. Watershed assessments, management plans, and protection measures should be holistic and look at water as a resource, regardless of whether it is drinking water supply, treated wastewater discharge, or storm water runoff.

A second way to increase cost-effectiveness and reduce redundancies is to coordinate efforts with other governments within the watershed. Figure 6 illustrates the multiple watershed assessments under way

Figure 6. Watershed Assessments in the Atlanta Metro Area



Boston Consulting Group for the Clean Water Initiative, August 2000

in one geographic area—the Atlanta metro area. It may be appealing to approach watershed assessment from a service area or jurisdictional boundary point of view, but interjurisdictional cooperation can ensure maximum efficiency and protection. For instance, since watersheds often overlap jurisdictional boundaries, several communities may be sampling and implementing measures for the same areas (to meet the same requirements). Likewise, without a collaborative effort at the watershed level, there may be gaps in data (such as upstream pollution contributions), and enforcement and meaningful protection measures may not be implemented.

To Protect Public Health, Safety, and Welfare

The final reason to use a watershed management approach is the most important goal of all: to protect the health, safety, and welfare of the public. As previously mentioned, water quality standards are the minimum safe level for humans and aquatic plants and animals. Water quality violations typically result in negative consequences. These could be program or permit moratoriums; publicity from fish kills or from required notification of drinking water system violations; or civil and, in extreme cases, criminal liability. If water suppliers are legally vulnerable for supplying contaminated drinking water, it clearly is good business to protect water supplies from contamination today rather than risk liability action tomorrow.

The watershed management approach is the best way to determine water quality and to target protection strategies and enforcement actions. Watershed management programs that emphasize protection prevent water quality deterioration and guard public health and environmental quality—as well as the permit holder. Prevention is also many times cheaper than clean-up, remediation, or restoration.

Water issues are linked in the watershed: upstream actions affect the quantity and quality of downstream water resources. A watershed management approach is needed to meet increasingly frequent requirements, to realize cost-effective and comprehensive solutions, and to provide necessary protection. Such an approach should integrate all regulatory program requirements, include all appropriate local governments, and implement a consistent protection program throughout the entire watershed.

State Water Programs

This section describes the three types of state water programs (locally required, state-initiated and watershed-related) that require or involve local watershed management efforts. Each description includes an overview of

- the program function and requirements,
- necessary approvals,
- links to other state water programs having similar requirements and outcomes or data needs,
- the program's geographic area of concern, and
- contact information for the administering state agency.

The legal authority to carry out the water program requirements is listed by program in the appendix, which provides references to federal statutes and state statutes and regulations and a website address for further information.

The heading "Locally Required" identifies the state water programs that require completion of one or more of the watershed management activities at the local level. These include programs with regulatory responsibilities to protect or manage water supply watersheds; wastewater collection, treatment, and discharge; and storm water collection, treatment, and discharge. Although requirements for the permitted community are different between programs, each helps to ensure that water quality standards are met and the public's health is protected.

The water programs that are initiated and, for the most part, accomplished by the state are identified by the heading "State-Initiated." Each of the state-initiated programs has a role for local involvement including the river basin management planning program, total maximum daily load program (TMDL), and source water assessment and protection program—wellhead protection program. These programs can be good sources of information to support local efforts and to coordinate the local watershed approach with state efforts.

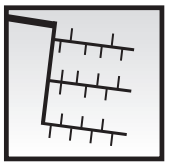
The heading "Watershed-Related" identifies the water programs that support the development of a local watershed management approach, with or without the need for a regulatory permit. The programs for water withdrawal, drinking water, on-site sewage management system, erosion and sedimentation control, floodplain management, coordinated planning, and service delivery strategy all lend themselves to supporting and enhancing local watershed management efforts. In ad-

dition, some of the watershed-related programs benefit other state water programs that do require a local watershed management approach.

The requirements for each state water program apply to a specific geographic area of concern. In the program descriptions, these geographic areas are represented graphically by the following symbols:

An area around the public drinking water well.

The upstream portion of the watershed.



The water or wastewater service area.

County or city jurisdiction.

Georgia's 14 river basin boundaries.

Water Supply Watershed Program

Locally Required

Function/Requirements

Local governments are required to protect their drinking water reservoirs or other public water supply intakes from contamination. The water supply watershed program is based on Part 5 environmental planning criteria to accommodate development in water supply watersheds and to manage water supply reservoirs while protecting the quality of public drinking water sources from existing and future contamination. The criteria describe the minimum steps necessary to protect drinking water quality, including setting impervious surface limits, designating buffer zones, prohibiting some types of activities, and establishing management practices. Local governments must develop and adopt water supply watershed protection ordinances that are based on these criteria, including reservoir management plans as necessary. If an approach to protecting the watershed other than the one described in the criteria is proposed, it must be supported by a locally developed watershed assessment.

Approvals

The Department of Community Affairs (DCA) formally notifies local governments by mail of the requirement to implement water supply watershed criteria. The local water supply watershed protection plan and/or protection ordinance must be submitted to DCA for approval. The reservoir management plan also must be submitted to DCA, which will then forward it to EPD for approval. Satisfying the water supply watershed program criteria allows local governments to maintain Qualified Local Government status and eligibility for certain state funding such as community development block grants, water and sewer loans, state revolving loans for construction of wastewater facilities, economic development grants, and greenspace grants.

Links to Other State Water Programs

- Evidence that the water supply watershed criteria have been addressed and protection ordinances and other measures have been implemented must be provided as part of the water withdrawal permitting process.
- Approved water supply watershed protection ordinances become incorporated into storm water permits in order to satisfy protection requirements.

Geographic Area of Concern

The upstream portion of the watershed from the drinking water intake in the water supply reservoir watershed.

- Implementation of approved water supply watershed protection ordinances and reservoir management plans will satisfy most of the source water assessment and protection program requirements.
- This program shares many of the same data collection and assessment and monitoring activities used in the wastewater permit, storm water permit, river basin management planning, total maximum daily load, and source water assessment and protection programs. It can be a good source of information to satisfy watershed management requirements in those programs.

Contact(s)

Coordinated Planning Program, DCA: (404) 679-3114.

Water Resources Management, Water Resources Branch, EPD: (404) 656-3094.

Wastewater Permit Program

Locally Required

Function/Requirements

Through the wastewater permit program, wastewater collection and treatment systems must receive a National Pollutant Discharge Elimination System (NPDES) permit to protect water quality, fish and wildlife, and human health from discharges into streams, rivers, and lakes. All local government, industrial, federal, or privately owned water pollution control facilities must meet planning, design, and operation standards to be permitted.

Presently, a watershed assessment is required for new or expanded wastewater permits. While an increase in wastewater treatment capacity will support additional growth, it will also add more effluent discharge to local water bodies. Communities must, therefore, plan for the impact that the additional effluent discharge and related growth will have on water quality by developing a watershed assessment and watershed resource protection plan.

Local governments are required to first assess the current status of the treatment facility service area and fix any related problems. Evaluating the watershed impacts of an expanded treatment area to address potential future problems is also required. Both current and future threats and remedies become conditions of the NPDES discharge permit or other enforceable watershed or water resources protection program requirements.

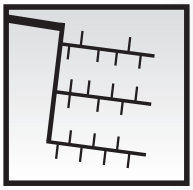
Approvals

Permit applications and completed watershed assessments must be submitted to EPD for approval. If a water body does not currently meet water quality standards and the local section of the stream, river, or lake appears on the 303(d) list of impaired waters, additional wastewater discharge permits will not be granted unless a total maximum daily load has been completed or the applicant can show through sampling and/or permit limits that discharges will not cause or contribute to further water quality impairments.

Links to Other State Water Programs

- Wastewater permits are linked to water withdrawal permit decisions because the two result in local land use changes that can affect water quality.
- If the jurisdiction has a water body on the 303(d) list, a total maximum daily load must be completed and implemented.

Geographic Area of Concern



The service area that may run inside and outside jurisdictional boundaries and/or the watershed.

- The program shares many of the same data collection and assessment and monitoring activities used in the water supply watershed, storm water permit, total maximum daily load, river basin management planning, and source water assessment and protection programs. It can be a good source of information to satisfy watershed management requirements in those programs.

Contact(s)

Engineering and Technical Support, Water Protection Branch, EPD:
(404) 675-6233.

Function/Requirements

Storm water discharges from some local governments, industrial facilities, and construction sites require a National Pollutant Discharge Elimination System storm water permit to protect water quality by eliminating or treating pollution-laden storm runoff. NPDES storm water permits for large- and medium-sized separate storm sewer systems were issued to local governments in 1994 and 1995 under Phase I of the program. In 1999, Phase II of the storm water program extended NPDES permit requirements to local governments with populations under 100,000 that are located in urbanized areas. In addition, EPD is required to evaluate local governments located outside urbanized areas with a population of at least 10,000 and a population density of at least 1,000 persons per square mile for potential permit coverage.

Local government NPDES storm water permit requirements include development of local storm water management programs and submission of annual reports to EPD on implementation of protection measures. The general NPDES permit also requires local governments to have adequate legal authority to implement and enforce the protection measures. Storm water management programs must be designed to reduce runoff pollution from commercial, industrial, and residential areas and to control illegal or improper discharges to the municipal storm sewer system. The programs also must include storm water monitoring and public education activities.

The industrial storm water permit program regulates discharges from 11 categories of industrial facilities including manufacturing; mining, oil, and gas operations; hazardous waste treatment, storage, or disposal; recycling; steam electric power generation; transportation; and facilities treating domestic sewage or sewage sludge. Over 2,900 industrial facilities in Georgia are currently covered under the general industrial NPDES storm water permit. Industrial storm water permit requirements include development and implementation of storm water pollution prevention plans that must be designed to reduce runoff pollution from manufacturing, processing, and materials storage areas.

The NPDES permit also regulates the discharge of storm water from construction activities to manage the quality of runoff and to help control erosion and sedimentation. Like the erosion and sedimentation control program, it emphasizes the use of structural and nonstructural engineering and conservation activities known as best

Storm Water Permit Program

Locally Required

Geographic Area of Concern

County or city jurisdiction within a watershed or overlapping watersheds.

management practices (BMPs) at construction sites where land-disturbing activities take place. The permit applies statewide, affecting construction activities that disturb more than five acres or tracts less than five acres that are part of a development that is larger than five acres. Phase II extends requirements to construction sites disturbing areas greater than or equal to one acre in size, but this requirement is currently under judicial review and its implementation has been delayed pending the results of that review.

Approvals

Local governments that meet the previously mentioned demographic and size criteria must develop and submit a storm water management program to EPD by March 2003 for approval. Thereafter, local governments must submit annual reports to EPD to remain in compliance with the general municipal NPDES storm water permit requirements.

Links to Other State Water Programs

- Phase II storm water permits do not have additional requirements beyond those required for Phase I. Much of the data collection and water quality determinations required under Phase I are the same as in the water supply watershed, wastewater permit, river basin management planning, total maximum daily load, and source water assessment and protection programs. Information gathered in these programs can be used to satisfy watershed management requirements in other programs.
- Storm water permits can incorporate aspects of approved water supply watershed protection plans to satisfy protection requirements.
- The storm water permit program has significant ties to the erosion and sedimentation control program, including design specifications that will prevent runoff during certain intensities of storms and a citizen lawsuit provision. The local erosion and sedimentation control program will continue to issue land-disturbance permits to local developers and can continue to control local inspection of erosion and sedimentation control practices.

Contact(s)

Nonpoint Source, Water Protection Branch, EPD: (404) 675-6240.

River Basin Management Planning Program

State-Initiated

Function/Requirements

The river basin management planning program represents Georgia's commitment to manage and protect water resources on a river basin or watershed level. It is an approach for assessing and prioritizing water resource issues, developing solutions, and identifying cooperative actions to improve water quality, enhance aquatic habitat, and provide a dependable water supply on a river basin level.

The river basin management planning program requires EPD to develop river basin management plans for 14 rivers in Georgia. The river basins have been grouped into five planning units and, to date, river basin plans have been completed for the Chattahoochee, Flint, Coosa, Oconee, and Tallapoosa Rivers. More basin plans will be completed in the coming years, and each of the five basin groupings will be updated on a five-year rotation.

River basins in Georgia are too large for specific and cooperative management activities. They provide the geographic level for regional management plans, but the smaller watershed areas are where actions like water quality monitoring, land use and nonpoint source pollution assessment, issue identification and prioritization, data management, and implementation of watershed protection measures take place. However, EPD will begin to revisit the issuance of state water program permits basinwide when the river basin management plans are updated.

Approvals

EPD submits the river basin management plans to the Board of the Department of Natural Resources for approval.

Links to Other State Water Programs

- The program shares many of the same data collection and assessment and monitoring activities used in the water supply watershed, wastewater permit, storm water permit, total maximum daily load, and source water assessment and protection programs. It can be a good source of information to satisfy watershed management requirements in those programs.

Contact(s)

Watershed Planning and Monitoring, Water Protection Branch, EPD:
(404) 675-6236.

Geographic Area of Concern

Georgia's 14 river basin boundaries.

Total Maximum Daily Load Program

State-Initiated

Function/Requirements

The total maximum daily load (TMDL) program requires the development of a "pollution budget" for all impaired streams, rivers, and lakes on the 303(d) list in order to restore water quality to minimum standards. The TMDL is the total amount of a specific pollutant a water body can receive without violating state water quality standards. A formula establishes the allowable amount of pollutants from local government and industrial discharges (point sources) and pollutants that flow into the water body from the land surface (nonpoint sources) given a specific margin of safety. The formula is illustrated as follows:

TMDL = Point Source Pollution Load + Nonpoint Source Load + Safety Factor

Point sources of pollution are those activities regulated under the wastewater permit program. Nonpoint pollution can include those sources of contaminants covered in the storm water permit and erosion and sedimentation control programs, as well as failing septic tanks or runoff from agricultural or other land use practices.

The U.S. Environmental Protection Agency (EPA) and the Georgia Environmental Protection Division (EPD) are under court order to develop TMDLs for all impaired waters in Georgia by 2005. Developed in partnership with local governments, agricultural and industrial representatives, and others, the TMDL will identify sources of specific pollutants within the watershed of the impaired stream, river, or lake and determine how much of the total load is caused by each type of pollution source. The TMDL is also required to show where pollution loadings will be reduced so that the stream, river, or lake will meet water quality standards.

Approvals

TMDL development is the responsibility of EPD and EPA. EPA provides final review and is responsible for approval of each TMDL.

Links to Other State Water Programs

- Well over three-fourths of the TMDLs targeted for development involve streams and rivers that violate water quality standards due to nonpoint source pollution. Implementation of TMDL plans will be directly linked to meeting requirments for storm water, erosion and sedimentation, and on-site sewage management.

Geographic Area of Concern

The upstream portion of the watershed of the impaired stream, river, or lake.

- Where a final TMDL suggests reduced loads from an existing wastewater treatment facility, EPD will reopen the wastewater permit and propose changes to implement the TMDL within 18 months.
- A TMDL must be completed if expansion of existing or new wastewater permit applications propose discharging the same pollutant(s) for which the receiving water is on the 303(d) list unless the wastewater permit applicant shows through sampling and/or permit limits that discharges will not cause or contribute to further water quality impairments.
- Many of the watershed assessment activities required for the development of TMDLs will be the same as or similar to those conducted for the drinking water permit, wastewater and storm water permit, river basin management planning, and source water assessment and protection programs. Data can be shared between programs, and objectives should be aligned to reduce competing efforts.
- Monitoring for effectiveness of TMDLs may overlap with monitoring conducted for the wastewater and storm water permit, river basin management planning, and source water assessment and protection programs.

Contact

Watershed Planning and Monitoring, Water Protection Branch,
EPD: (404) 675-1752.

Source Water Assessment and Protection Program—Wellhead Protection

State-Initiated

Function/Requirements

The source water assessment and protection program requires every public drinking water system in Georgia (providing treated water to 15 or more connections or to at least 25 people) to have a source water assessment plan (SWAP) in place by 2003 to protect surface sources of drinking water from contamination. The plans must identify potential pollution sources upstream of the surface water intake and within the wellhead protection area for groundwater supplies. In most cases, the watershed assessment area will be delineated by EPD and that information provided to the local government. Based on the assessments, the plans must also identify source water protection priorities, recommendations for protecting the drinking water source (such as BMPs), and schedules to implement the protection measures.

In addition, wellhead protection plans must be developed to protect groundwater sources of local governmentally owned public water systems against contamination. After the protection plan is developed, local governments can implement a wellhead protection program through an ordinance prohibiting certain land use activities within the inner management zone of the wellhead protection area that may threaten drinking water quality.

SWAP requirements for nongovernmental public water systems that use groundwater sources will be met using EPD's Monitoring Waiver Initiative Program (MWIP). The MWIP is similar to the wellhead protection program in terms of assessing groundwater sources for potential contamination. Contamination risk assessment takes into account the local and regional geology, the water system's monitoring history, and the number and type of potential pollution sources within the monitoring waiver review area.

Approvals

Many of the source water assessments will be developed by Regional Development Centers, EPD, or consultants, but local governments will be asked to participate in the development of assessments and to coordinate protection actions with the plan. Local governments also can conduct watershed studies to supplement the SWAPs or to verify watershed conditions.

EPD's Geologic Survey Branch expects to prepare wellhead protection plans for all existing local governmentally owned community water system wells by 2003. When an application for a new well

Geographic Area of Concern

The upstream portion of the watershed from the drinking water intake for surface water sources.

An area around the public drinking water well known as the wellhead protection area.

is received, the Geologic Survey Branch delineates a preliminary wellhead protection area and carries out a potential pollution source inventory. EPD also conducts the monitoring waiver review for non-governmental public water systems using groundwater sources of drinking water.

Links to Other State Water Programs

- Existing public water supply wells must have a wellhead protection plan to renew groundwater drinking water permits. For new local governmentally owned community water system wells, a preliminary wellhead protection plan must be prepared before a drinking water source water approval permit will be issued.
- Requirements for the SWAP effort are similar to watershed assessment activities required for other programs such as the wastewater permit, storm water permit, river basin management planning, and total maximum daily load programs. SWAP assessments can be a good source of information to satisfy watershed management requirements in those programs.
- Local governments that have already implemented water supply watershed plans may have satisfied the implementation requirements for protection measures under SWAP.

Contact(s)

Drinking Water Compliance, Water Resources Branch, EPD: (404) 651-5168 or (404) 656-4807.

Geologic Survey Branch, EPD: (404) 656-3214.

Water Withdrawal Permit Program

Function/Requirements

The water withdrawal permit program ensures water quality and proper management of water resources by requiring a permit for all surface water and groundwater withdrawals of 100,000 gallons or more per day on a monthly average. Any person who diverts surface water by more than 100,000 gallons per day as it flows off his/her property must also obtain a permit. In addition, any person who plans to construct an impoundment that will reduce the flow of surface water by more than 100,000 gallons per day downstream of the impoundment is required to obtain a permit. Agricultural groundwater and surface water users of more than 100,000 gallons per day on a monthly average are also required to obtain permits.

Approvals

Any individual, local government, governmental agency, industry, authority, or military installation that meets the withdrawal standards mentioned above must submit a permit application to EPD for approval prior to withdrawing, diverting, or impounding water.

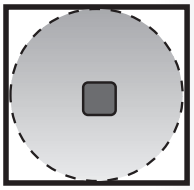
Links to Other State Water Programs

- Water withdrawal decisions are linked to the combined effect of other permit programs and the impact of land use changes on water quality. Water withdrawal applications are coordinated with the wastewater, storm water, and drinking permit programs and the source water assessment and service-delivery strategy programs. Withdrawal permits may be delayed until applicable watershed assessments and/or other requirements have been satisfactorily completed for these programs.
- Evidence that the water supply watershed program requirements have been addressed and the appropriate ordinances and protection measures have been implemented must be provided as part of the water withdrawal permitting process.

Contact(s)

Water Resources Management, Water Resources Branch, EPD: (404) 656-3094.

Geographic Areas of Concern



An area around the public drinking water well known as the wellhead protection area.

The upstream portion of the watershed from the water intake for surface water sources.

Watershed-Related

Drinking Water Permit Program

Watershed-Related

Function/Requirements

Any individual, local government, corporation, or authority that treats and distributes drinking water to 15 or more connections or to at least 25 people must have a permit to operate. The operating permits ensure disinfection and purification of drinking water to safe standards for human consumption.

As of September 1999, 2,594 public water systems were permitted to operate. About 80 percent of Georgia's population obtains its drinking water from surface water sources, although only 223 of the total number of systems use surface water sources. Of the 2,594 public water systems, 2,371 use groundwater as the source of drinking water, about 20 percent of the state's population. Many of these surface water and groundwater public drinking water systems are owned and operated by nongovernmental entities such as private water companies, homeowner associations, and trailer parks but are required to meet the same permit and program requirements.

Approvals

Any individual, local government, corporation, or authority that provides drinking water to 15 or more connections or to at least 25 people must submit a permit application to EPD for approval prior to treating and distributing waters. Local governmentally owned community water systems that provide groundwater sources of drinking water must also have a Geologic Survey Branch completed wellhead protection plan, as described in the source water assessment and protection program, prior to issuance of the drinking water permit.

Links to Other State Water Programs

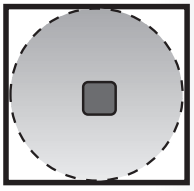
- The drinking water permit primarily concerns the design and operational capacity of the treatment facility, but permit decisions are linked to satisfaction of the water withdrawal permit requirements.
- Groundwater sources in the drinking water permit are directly linked to completion of the wellhead protection component of the source water assessment and protection program for local governmentally owned public water systems.

Contact(s)

Drinking Water Permitting and Engineering, Water Resources Branch, EPD: (404) 656-2750.

Geographic Area of Concern

The upstream portion of the watershed for the water intake for surface water sources.



An area around the public drinking water well known as the wellhead protection area for groundwater sources.

Function/Requirements

The on-site sewage management system program regulates what are commonly called septic tanks to prevent discharge of wastewater effluent. Discharge of effluent from leaking and poorly designed or installed septic tanks creates a potential health risk for humans who may come into contact with the wastes. The discharge may also move into surface water and groundwater sources of drinking water, creating a situation that violates water quality standards and threatens public health. Three primary ways to help avoid health risks are installing septic tanks and their drain fields away from drinking water sources, installing the systems in soils that allow a good rate of percolation of the treated wastewater, and maintaining existing systems by having them pumped every 3–5 years.

Septic tanks usually serve one or more homes but may be used for other types of buildings such as schools, restaurants, churches, and offices. The Environmental Health Section of the Division of Public Health in the Department of Human Resources (DHR) is responsible for adopting and administering statewide regulations for the design and installation of on-site sewage systems. Permitting and inspection of these systems is handled through each county board of health, which serves as the local representative of the Division of Public Health.

Larger residential, community, and industrial septic systems serving 20 or more persons per day (with the capacity to handle 2,000 or more gallons per day of wastewater) are now considered Class V Underground Injection Systems. After July 1, 2001, construction and operation of Class V septic systems require a permit from EPD.

Approvals

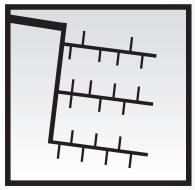
An application to install an on-site sewage management system must be submitted to the local county health department by the builder/developer for approval. The application must include information concerning the peak daily waste flow, wastewater characteristics, soil characteristics, plans, and specifications including the location and design of the proposed septic tank system. A state-certified on-site sewage system contractor must install all septic tank systems. DHR must approve alternative or experimental on-site sewage management system designs prior to use.

EPD's Geologic Survey Branch will review Class V septic system applications for groundwater contamination concerns, and approval

On-Site Sewage Management System Program

Watershed-Related

Geographic Area of Concern



The service area (specific building sites) that may run inside and outside jurisdictional boundaries and/or the watershed.

will be issued under a general, statewide land application system permit. Coverage under the permit will be automatically granted if the DHR verifies with EPD, through an annual inventory of new and existing systems, that the systems meet requirements. These requirements include written determination by a state-certified registered geologist or engineer that the system does not threaten the quality of a groundwater source of drinking water and is not within the inner management zone of any existing wellhead protection area.

Links to Other State Water Programs

- The on-site sewage management program may be linked to meeting total maximum daily load objectives. The total maximum daily load program is required to determine all sources of pollution to water bodies that are on the 303(d) list and to reduce the total inputs including those from faulty septic tank systems, if any.
- Septic tank installation is restricted in the inner management zone of an existing wellhead protection area under the source water assessment and protection program to prohibit contamination of groundwater sources of drinking water.
- Septic tank installation is restricted by the Part 5 environmental planning criteria that local comprehensive plans must address under the coordinated planning program. There are minimum lot size restrictions for septic tank and drain field installation in significant groundwater recharge areas of the state. In addition, the river corridor protection criteria prohibit the installation of septic tanks and drain fields in buffer areas and also set minimum lot size restrictions.
- The floodplain management program prevents the placement of septic tanks in flood prone areas to help protect water supplies.

Contact(s)

Engineering and Technical Support, Water Protection Branch, EPD: (404) 675-6233.

Environmental Health Section, Division of Public Health, DHR: (404) 657-6534.

Geologic Survey Branch: (404) 656-3214.

Erosion and Sedimentation Control Program

Function/Requirements

The erosion and sedimentation control program is a statewide program to protect and conserve air, land, and water resources. The program regulates land-disturbing activities that might result in the erosion of soil from a construction site or the movement of sediments into waters of the state. The program also prohibits land-disturbing activities within 25 feet of warm water streams or 50 feet of trout streams without a variance granted by the director of EPD.

The erosion and sedimentation control program allows local governments to take primary responsibility for implementation by adopting and enforcing erosion and sedimentation control ordinances. Where local ordinances have not been adopted and certified, EPD is responsible for permitting, inspection, compliance, and enforcement of the program. The erosion and sedimentation control program requires that a permit be issued for land-disturbing activities such as clearing, grading, excavating, or filling of land, with certain exemptions. To receive a permit, an applicant must submit an erosion and sedimentation control plan to the issuing authority that incorporates specific BMPs.

If an erosion and sedimentation violation is suspected, a report of the incident is made to the local government body that issued the permit. If the activity occurs in a locality that has not been certified to issue permits, reports are made to the EPD regional office. Complaints are first addressed by the local issuing agency, if one exists. If not resolved, the complaint is then referred to the appropriate Georgia Soil and Water Conservation District. If the situation remains unresolved after the appropriate district has exhausted its local remedy, the complaint is referred to EPD.

Approvals

Local ordinances are reviewed by EPD and, if approved, the local government is granted the authority to issue and enforce permits for land-disturbing activities. If the local government fails to adequately administer its erosion and sedimentation control ordinance, EPD may remove the local government's authority to issue permits for land-disturbing activities and to implement the local program requirements.

Geographic Area of Concern

County or city jurisdiction.

Links to Other State Water Programs

- Program objectives and management practices are similar in the erosion and sedimentation control and storm water permit programs. Design specifications that prevent runoff during certain intensities of storms can be shared between the programs. In addition, a citizen lawsuit provision in the storm water program may be used to aid in the enforcement of the erosion and sedimentation control program.
- Meeting erosion and sedimentation control program requirements will be directly linked to the TMDL program because well over half of the TMDL water quality violations are due to sediment-related nonpoint sources of pollution.

Contact(s)

Nonpoint Source, Water Protection Branch, EPD: (404) 675-6240.

Floodplain Management Program

Function/Requirements

The Floodplain Management Program assists local governments in understanding, implementing, and maintaining compliance with the criteria of the National Flood Insurance Program (NFIP). The NFIP is a voluntary federal benefits program for jurisdictions with identified flood hazard areas. It requires participating communities to adopt and enforce local zoning ordinances and building codes designed to reduce losses by regulating development in flood hazard areas.

The NFIP criteria also require new and upgraded water supply systems in flood-prone areas to be designed to minimize or eliminate infiltration of floodwaters into the system. These measures help protect drinking water supplies by preventing the location of septic tanks in flood-prone areas and by removing significant threats to the drinking water supplies from flood-borne contaminants. Participating communities that implement these and other flood damage reduction measures are eligible for previously unavailable flood insurance coverage.

Approvals

Voluntary program participation.

Links to Other State Water Programs

- Although the floodplain program is primarily concerned with the amount of flood water, it has similar water quality objectives as the storm water permit, surface water drinking water permit, and on-site sewage management programs.
- The floodplain management program may share the same floodplain development restrictions and buffer zone protection measures as the water supply watershed program.

Contact(s)

Water Resources Management, Water Resources Branch, EPD: (404) 656-6382.

Geographic Area of Concern

County or city jurisdiction flood hazard areas.

Function/Requirements

The coordinated planning program guides local governments in planning for the future and communicating with neighboring jurisdictions regarding those plans. The program (also known as the local government comprehensive planning program) sets minimum planning standards and procedures for developing and adopting local comprehensive plans. The plans must address five topical elements: economic development, natural and historic resources, community facilities and services, housing, and land use. Plans must also include population information, such as trends in growth and demographic characteristics, so that the five elements can be considered in light of current and future needs.

In addition, comprehensive plans must address Part 5 environmental planning criteria designed to protect and conserve critical environmental resources. Plans must determine if any of the critical environmental resources exist within the local government's jurisdiction and, if so, whether all or part of the Part 5 environmental planning criteria will be implemented through local protection measures. Of the five types of environmentally sensitive areas (water supply watersheds, protected river corridors, wetlands, significant groundwater recharge areas, and protected mountains), only the water supply watershed criteria focus on watershed management. Therefore, it is the only program description that has been included in this guidebook.

Approvals

Local governments submit comprehensive plans and local protection ordinances to DCA for review and approval. The Part 5 environmental planning criteria must be part of each local government's comprehensive plan and implementing ordinances in order to meet the minimum standards. Satisfaction of the coordinated planning program responsibilities allows local governments to maintain Qualified Local Government status and eligibility for certain state funding such as community development block grants, water and sewer loans, state revolving loans for construction of wastewater facilities, economic development grants, and greenspace grants.

Links to Other State Water Programs

- The significant groundwater recharge areas and river corridor protection areas identified in local comprehensive plans directly

Coordinated Planning Program

Watershed-Related

Geographic Area of Concern

County or city jurisdiction.

link the coordinated planning program to the on-site sewage management program by establishing larger lot size requirements for the installation of septic tank systems.

- Local comprehensive plans provide valuable information on current and anticipated conditions and activities in the watershed. In particular, comprehensive plans will likely include the most current and complete set of existing data on local natural resources, land use, facilities and infrastructure, and population demands.
- Comprehensive plans should be consulted as part of the watershed assessment component of the water supply watershed, wastewater permit, storm water permit, total maximum daily load, and source water assessment and protection programs.

Contact(s)

Office of Coordinated Planning, DCA: (404) 679-3114.

Function/Requirements

Through the service delivery strategy program, local governments are required to develop and adopt a service delivery strategy that defines jurisdictional responsibility for delivery of current and anticipated water and wastewater services, among other services. The strategy is intended to be a plan of action to minimize governmental service duplication, overlap, and competition by defining delivery responsibilities among city and county governments. Strategies must also eliminate conflicts between city and county land use plans and ensure that water and sewer extensions are consistent with local land use plans. Although the deadline for submitting service delivery strategies was June 1, 1999, local governments must review and revise their strategy at certain times and under certain circumstances. These include

- comprehensive plan updates,
- changes in service delivery or revenue distributions, and/or
- changes in the local government status such as creation, abolition, or consolidation.

Approvals

Counties are required to submit the adopted and revised strategies to DCA for review and verification. State grants and loans, environmental permits, and Department of Transportation permits will not be issued to any local government or authority that is not included in a DCA-verified service delivery strategy.

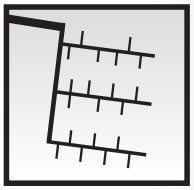
Links to Other State Water Programs

- The service delivery strategy program is directly linked to all state water programs that require permits or provide financial assistance, including the drinking water, wastewater, storm water, and water withdrawal programs. A DCA-verified strategy is required before a permit can be issued to a provider of the service under review or to a project or activity in an area not included in a verified strategy.
- The program is linked to the coordinated planning program through the land use element of comprehensive plans and the environmental planning criteria.
- A service delivery strategy may contain the most up-to-date information on specific water and wastewater services such as intakes, outfalls, and capacity. As such, it is an important source

Service Delivery Strategy Program

Watershed-Related

Geographic Area of Concern



The service area within county boundaries that may run inside and/or outside the watershed.

of existing data in meeting requirements of the wastewater and storm water permit, total maximum daily load, and source water assessment and protection programs. In addition, it is a source of data for developing watershed management components, including assessments, management plans, and protection strategies.

Contact(s)

Office of Coordinated Planning, DCA: (404) 679-3114.

A Comprehensive and Integrated Watershed Approach

For local governments to address their water-related responsibilities, they must interact with several state water programs. Each of the state water programs has requirements that may relate to or overlap with other state program requirements within a watershed. Some local governments are already involved in a watershed management approach that was triggered by one or more of the previously mentioned programs. Many other local governments will soon have to start a watershed approach. Starting dates depend on the community's size, population growth, drinking water source, known water quality impairments, and other factors. Coordination and communication between the state water programs and local officials can lead to more efficient and more effective management of water-related responsibilities.

State Water Programs: Links and Overlaps

Some state water programs are directly linked: approval of one program is dependent on compliance with another. The darkened boxes in table 1 show the programs that are directly linked. Programs are indirectly linked when specific activities required of one program provide opportunities for satisfying similar activities in another (shown in the table as open boxes). For example, if two programs require the development of a protection plan, a document written to include the components of both programs provides an opportunity to save time and money. Likewise, data collection and monitoring activities can be overlapped to satisfy requirements for more than one state water program.

The state water programs might overlap in one or more of the following elements:

- program outcomes (permit, assessment, plan, ordinance, or protection actions)
- geographic area of concern in the watershed
- data collection requirements (sampling, monitoring, or modeling)
- water quality determinations (identifying pollution source(s) and determining the susceptibility of the water supply to contamination)
- timing considerations

State water programs and program elements are listed in table 2, showing which programs share exactly the same or similar elements.

Table 1. State Water Program Links

State Water Programs	Water Supply Watershed	Waste-water Permit	Storm Water Permit	River Basin Management	Total Maximum Daily Load	Source Water Assessment and Protection—Wellhead Protection	Water With-drawal Permit	Drinking Water Permit	On-Site Sewage Management System	Erosion and Sedimenta-tion Control	Floodplain Manage-ment	Coordi-nated Planning	Service Delivery Strategy
Locally Required													
Water Supply Watershed		□	□	□	□	□	■				□	□	
Wastewater Permit	□		□	□	■	□	■					□	■
Storm Water Permit	□	□		□	■	□	■			□	□	□	■
State-Initiated													
River Basin Management Planning	□	□	□		□	□							
Total Maximum Daily Load	□	■	■	□		□		□	□	■		□	□
Source Water Assessment and Protection—Wellhead Protection	□	□	□	□	□			■	□			□	□
Watershed-Related													
Water Withdrawal Permit	■	■	■					■					■
Drinking Water Permit					□	■	■				□		■
On-Site Sewage Management System					□	□					□	□	
Erosion and Sedimentation Control			□		■								
Floodplain Management	□		□					□	□				
Coordinated Planning	□	□	□		□	□			□				■
Service Delivery Strategy		■	■		□	□	■	■				■	

■ Directly linked □ Indirectly linked

When state water program requirements include approval or compliance with another program, there is a direct link between the programs and an obvious reason to accomplish both. Integrating various program components can reduce redundancies and increase cost-effectiveness and also usually results in better information, supporting a more comprehensive approach to managing water-related responsibilities.

The One-Stop Watershed Management Conference

The One-Stop Watershed Management Conference was developed to identify the components of an integrated and comprehensive watershed management approach that is unique to the needs and circumstances of an individual community. It is an innovative concept to increase coordination and communication between the regulated community and state water programs. The conference process can be arranged in two ways:

1. When an application for one of the state programs is received, a representative of EPD or DCA will arrange a One-Stop Watershed Management Conference with the applicant and representatives of relevant state water programs.
2. An applicant can call a representative of an EPD or DCA state water program and request a conference before submitting the permit application.

The conference can help applicants understand the full breadth of state water programs, increase their ability to identify related requirements that can be simultaneously addressed or, at a minimum, coordinated. Conference discussions explore how the state water programs can be integrated into a creative, site-specific, cost-effective, and comprehensive watershed management approach. Discussions should address how the applicant or local government can

- combine local actions required by a state water program with other program requirements;
- combine local actions with state-initiated activities occurring within or overlapping the watershed that provide opportunities to coordinate, accomplish additional watershed management elements, reduce duplication, or realize cost savings; and
- combine other water-related program elements that help strengthen and enhance a local watershed management program.

Figure 7 presents questions to explore in the conference to help determine how the current requirements can be linked with other key programs and to design a comprehensive watershed approach.

Table 2. State Water Program Overlaps

		Program Elements				
	State Water Programs	**Outcomes**	**Area of Concern**	**Data**	**Water Quality**	**Timing**
Locally Required	Water Supply Watersheds	Assessment Plan Ordinance Action	The upstream portion of the watershed	Chemical Physical (habitat) Biological Stream flows/volumes	Inventory pollution source Identify impairments Identify potential threats Characterize water quality	Five-year cycle
	Wastewater Permit Program	Assessment Plan Permit	The water or wastewater service area	Chemical Physical (habitat) Biological Stream flows/volumes	Inventory pollution source Identify impairments Identify potential threats Characterize water quality	Appl. for new or expanded permit
	Storm Water Permit Program	Plan Permit Reports	County or city jurisdiction	Chemical Physical (habitat) Stream flows/volumes Predictive modeling	Inventory pollution source Identify impairments Identify potential threats Characterize water quality	2003
State-Initiated	River Basin Management Planning Program	Plan	Georgia's 14 river basin boundaries	Chemical* Physical (habitat)* Biological* Stream flows/volumes*		Five-year cycle
	Total Maximum Daily Load Program	Plan	The upstream portion of the watershed	Chemical* Physical (habitat)* Biological*	Inventory pollution source* Identify impairments* Identify potential threats* Characterize water quality*	2005
	Source Water Assessment and Protection Program—Wellhead Protection	Assessment Plan Actions	The upstream portion of the watershed and/or an area around the public drinking water well	Chemical* Physical (habitat)* Biological* Cryptosporidium*	Inventory pollution source* Identify impairments* Identify potential threats*	2003
Watershed-Related	Water Withdrawal Permit Program	Permit	Area around the public drinking water well The upstream portion of the watershed	Stream flows/volumes	Inventory pollution source Identify impairments Identify potential threats Characterize water quality	Appl. for new or expanded permit
	Drinking Water Permit Program	Permit	The upstream portion of the watershed and/or an area around the public drinking water well	Chemical Physical (habitat) Biological Cryptosporidium*	Characterize water quality	Appl. for new or expanded permit
	On-Site Sewage Management System Program	Permits	The water or wastewater service area	Peak wastewater flows	Characterize wastewater Characterize soils	Appl. for installation and operation permits
	Erosion and Sedimentation Control Program	Ordinance	County or city jurisdiction	Chemical* Physical (habitat)* Biological* Cryptosporidium* Stream flow/volumes*	Inventory pollution source* Identify impairments* Identify potential threats* Characterize water quality*	Issuance of land-disturbance permits
	Floodplain Management Program	Ordinance	County or city jurisdiction			Participation in NFIP
	Coordinated Planning Program	Plan Ordinance	County or city jurisdiction	Environmental planning criteria Land use Demographics		Five-year cycle
	Service Delivery Strategy Program	Plan	The water or wastewater service area	Facilities		Ten-year cycle in service delivery

* Responsibility of the state

Figure 7. One-Stop Watershed Management Conference Checklist

- ❑ Do you have a drinking water intake?
- ❑ What is the drinking water supply source (surface water or groundwater)?
- ❑ What are the anticipated needs for additional water supply, and what might be the supply source?
- ❑ What amount/volume of treated water is currently being discharged and where?
- ❑ What is the anticipated wastewater capacity need, and where might it be discharged?
- ❑ Does the local government have water bodies on the 303(d) list or other water quality violations?
- ❑ What water quality standards are violated, and what are the target standards?
- ❑ What are the current demographics and land uses, and what are the demographic and land use projections for the future?
- ❑ Are there community water service limitations or opportunities?
- ❑ What programs have permit renewal or plan submission requirements coming up soon?
- ❑ What are the short- and long-term data needs (collection, monitoring, and other fieldwork) that could satisfy multiple permit and planning purposes?
- ❑ What additional data or information is needed to evaluate current conditions and to estimate future effects of major sources of background, point, and nonpoint pollution under current and various future management scenarios?
- ❑ What is the best approach to conducting the scientific data collection, analysis, and modeling and monitoring to meet requirements and to ensure that the information is usable by the widest audience and for the longest time period?
- ❑ How should water quality issues or watershed activities be prioritized so the most savings can be realized during monitoring and protection activities?
- ❑ Are there previous watershed protection and management efforts in place?
- ❑ Are there ongoing planning efforts and regulatory processes relevant to the scope of watershed management?
- ❑ When and in what form should reports be submitted?

A Comprehensive Watershed Management Approach

A comprehensive watershed management approach can result in significant efficiencies in effort and water resource protection. Although there is currently no standard approach that must be followed, portions of a watershed approach are required or suggested by individual state water programs. The lack of a standard watershed management approach allows for development of flexible, site-specific watershed programs, but it may also cause confusion about where to start and how to proceed.

A typical watershed management program has six integrated components, each of which involves many activities and steps. The following component descriptions do not provide policy on minimum watershed management requirements; instead, they offer an approach to

begin the thought process and trigger questions about an individual situation. A local watershed management approach may be more easily understood and accomplished if it focuses on the specific pollutants that violate water quality standards and the actions necessary to protect, comply with, or restore the designated use of the stream, river, or lake.

Project Management

Immediate and ongoing coordination of watershed management actions is critical. Typically, the permit holder/local government has a large role in project management because it is responsible for fulfilling state program requirements. A local government facing a regulatory requirement may want to be the sole coordinator, but often a consulting firm is retained to provide at least some of the project management services. Project management may be best accomplished by sharing the tasks and responsibility. For instance, budget implementation and final oversight may remain a local government responsibility while the day-to-day management of the process may be assigned to a consultant. Regardless of how the responsibilities are divided, any entity with project management functions should identify a contact person to act as an information conduit.

Project Management Activities to Initiate the Process

Identify (map) the watershed of concern and indicate

- political jurisdictions, pertinent authorities, and organizations within the watershed(s);
- physical characteristics, land use, and population information;
- facilities and activities that can affect or are affected by water quality or quantity; and
- service areas and areas that warrant special water quality protection measures.

Determine goals and objectives and prioritize issues and subbasins.

Establish a clear planning framework and develop a work plan to achieve objectives, including a schedule and budget.

Define roles and responsibilities of local and regional entities and consultants (if used) and identify resources for watershed management.

Establish common data collection and data management protocols to

- assess funding, staffing, and technical requirements;
- yield more usable information and facilitate data sharing; and
- permit use of the data over time by multiple entities.

Develop a stakeholder involvement and education process.

Stakeholder Involvement

In order to achieve stakeholder involvement, a project manager must provide opportunities and information for full and equal participation in the watershed management process. The stakeholders should comprise all parties affected by or interested in the watershed management program including local governmental departments; the general public; watershed jurisdictions; regional, state and federal agencies; business concerns; and civic, special interest, and environmental groups.

Stakeholder involvement may be provided by an advisory committee that represents all interests. But, regardless of the method, stakeholder participation throughout the process can help identify a broader range of issues and solutions, building the local agreement needed to implement protection actions. Stakeholder involvement can also help identify watershed management activities currently under way or completed and other opportunities for increasing efficiencies and eliminating duplication.

Watershed Assessment

Watershed assessment involves determining the health of the watershed waters through the collection and analysis of chemical, physical, and biological data. Comprehensive watershed assessments include comparing actual water quality with state standards during both dry- and wet-weather conditions and identifying potential threats to drinking water sources. If the data do not already exist, short-term studies and monitoring are necessary to provide the needed information. The information can help verify violations of the water quality standards, determine threats from current and potential contamination sources, and determine the degree of habitat degradation. All of this information is necessary for establishing protection, management, and restoration priorities. Since the activities in the watershed assessment component are technical and science based, they are nearly always contracted to a consultant, although some of Georgia's larger communities have accomplished these activities with in-house expertise.

Data collection and assessment are an expensive aspect of the watershed management process. The greatest differences in terminology and methodology preferences among the state water programs occur in this component. Meeting reqirements without addressing these differences can cost local governments and the permitted community a great deal of money. Coordinating the data collection, monitoring, and fieldwork of watershed studies can reduce the duplication of efforts and also help prevent overstudy of a watershed site that yields minimal understanding and little, if any, practical effect on water quality.

Key Concepts in Watershed Assessment

Rank waters for data collection based on the level of risk associated with specific issues and the quality of existing information.

Prior to undertaking new studies, develop a workable, effective data collection or monitoring plan or protocol specifying objectives, techniques, and end points of data collection.

Divide studies into three phases to ensure that the appropriate data are collected and evaluated to determine whether a problem exists and whether corrective action is needed. These phases are

- use of existing information to the greatest extent possible;
- new, short-term studies critical for understanding trends in physical, chemical, and biological characteristics that can be completed within the planning time frame; and
- long-term monitoring to fill data gaps and inform the adaptive management component of the watershed process.

Evaluate data collected to ensure that it indicates a further course of action.

Report results.

Ensure that the assessment process is broadly inclusive and uses stakeholder input.

Consider implementation at every stage of the assessment process.

The watershed assessment information is used to evaluate current and predicted future water quality problems. It should include water quality models (predictive tools) to demonstrate how water quality standards can and will be met in the watershed. Such predictions should include forecasted trends in land use changes and the predicted effects of protection recommendations. This and other watershed assessment information form the basis on which to recommend short- and long-term solutions in the watershed management plan.

The Watershed Management Plan

The watershed management plan is a strategy document that recommends and prioritizes protection measures to solve water quality issues identified in the assessment process. A key aspect of watershed planning is integrating the management plan with other local, multijurisdictional, regional, river basin, state, and even multistate planning processes, if applicable. This integration can be achieved by using traditional planning techniques including

- issue identification,
- analysis of cause and effect,
- evaluation of alternative solutions using specified criteria,

- recommendation of preferred short-term and long-term actions,
- an implementation program to ensure achievement of desired objectives, and
- reporting mechanisms.

The water management planning component is also frequently contracted to a consultant but can be accomplished in-house if there are adequate staff resources and expertise.

The watershed management plan should focus on technical, political, and educational solutions that will protect or restore water quality standards. It may provide opportunities to protect water supplies, green space, and riparian corridors and improve stream habitat, property values, and quality of life.

The political feasibility of implementing each solution sould be evaluated based on legal authority and institutional capacity. The legal authority evaluation could include

- identification of all local governments with authority over land use and development activities within the watershed,
- evaluation of each local government's codes and other regulations to determine if adequate authority exists to implement a plan for each entity, and
- identification of areas where additional legal authority is needed.

Institutional evaluation of capacity includes identifying organizations capable of making implementation commitments, identifying potential funding sources, and considering secondary plans in case certain elements cannot be implemented as expected.

Key Concepts in Watershed Planning

Establish goals for the entire watershed, although the local government(s) may choose to focus resources on problem solving in specific areas.

Establish a longer-term process for finding answers and improving solutions. A watershed plan does not need to offer all the answers.

Distinguish clearly between

- agreement on facts and
- agreement on the implications of facts and potential solutions.

Ensure that the planning process is broadly inclusive and uses stakeholder input.

Consider implementation at every stage of the planning process.

Implementation of Protection Measures

Watershed management must go beyond the study of watershed health (in the assessment component) and the development of a plan to actual implementation of protection measures and the monitoring of their effectiveness. All aspects of the implementation component must be considered from the start for watershed management to be successful. For instance, selection of an implementation committee and formal agreements with entities that accept implementation responsibilities should be considered when organizing the project management phase.

Funding will clearly be one of the key aspects of implementation. The watershed management program will contain a variety of activities that may be funded in part by state and federal grants and loans, but it is likely that local funding will be necessary for a portion of the costs. However, by taking a comprehensive watershed management approach, a local government may lower its total expenditures.

Monitoring and Improving the Program: Adaptive Management

The final component of watershed management is actually an ongoing process based on the concept of adaptive management. The adaptive-management process establishes procedures for monitoring the results or measuring the success of the protection or restoration activities that were implemented. It verifies the effectiveness of the actions taken. The adaptive-management process allows for continual and flexible improvement to the watershed management program based on better information collected over time and on changing social, economic, and environmental needs and priorities.

The six watershed management components—project management, stakeholder involvement, watershed assessment, a watershed management plan, implementation of protection measures, and program monitoring and improvement—provide a framework for achieving water quality goals. The components also support a comprehensive approach to integrating water program requirements, reducing duplicative efforts, and realizing cost savings.

Conclusion

With a legacy of water resource decisions made program by program and water resource responsibilities implemented jurisdiction by jurisdiction, a change in approach is required to manage water effectively. Actions must be taken to protect water quality, to protect the watershed, and to plan for the future. To manage water resources efficiently, these actions must be brought together in a comprehensive approach that involves all of the state water programs and all of the stakeholders in the watershed.

Increasingly, state water programs consider the impact that water resource decisions have on land use changes. Therefore, local water quality responsibilities are more frequently connected to land use responsibilities, even when water and land use are managed by two different local government departments or when the permit holder is not a local government and has no land use control. This split in responsibility and authority makes communication and coordination between governmental departments and between permit holders and those with local land use authority critical.

Communication and coordination at the local-regional level are just as important in a watershed approach. The many different regional arrangements in the state make local-regional coordination challenging. Currently, there are 5 EPD districts, 16 Regional Development Centers, 19 DHR health districts and 159 boards of health, 159 counties, 527 cities, and 52 major watersheds. Even though regional coordination may be difficult, it is critical to help establish consistent watershed-wide protection standards that do not hinder local development potential.

Communication and coordination with the public and business community are also important. They help build the local agreement that will support watershed-wide protection measures, educate stakeholders about their role in protecting important water resources, and can provide the information and tools to make investment-based business decisions.

The One-Stop Watershed Management Conference is an innovative way to design a comprehensive watershed management approach that integrates and coordinates the water quality and the watershed protection and planning objectives of the multiple state water programs. While this local-state interaction is a good first step, communication and coordination at all levels are just as important and are key hallmarks of a comprehensive watershed management approach.

Appendix. Federal Statutes, State Statutes, and State Regulations Relating to Watershed Management

Program	Federal Statute	State Statute	State Regulations (GA. COMP. R. and REGS.)
Water Supply Watershed Program		Promulgation of Minimum Standards and Procedures for Protection of Natural Resources, Environment, and Vital Areas of the State, O.C.G.A. §12-2-8 (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	Criteria for Water Supply Watersheds r. §391-3-16-.01 (1999) www.ganet.org/rules/index.cgi?base=391/3/16/01
Wastewater Permit Program	Clean Water Act 33 U.S.C. §§1342(a), (b) (2000) www.epa.gov/epahome/laws.htm	Georgia Water Quality Control Act O.C.G.A. §12-5-30(a) (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	Rules for Water Quality Control r. §391-3-6-.06(3)(a) (2001) www.ganet.org/rules/index.cgi?base=391/3/6/06
Storm Water Permit Program	Clean Water Act 33 U.S.C. §§1342(b), (p) (2000) www.epa.gov/epahome/laws.htm	Georgia Water Quality Control Act O.C.G.A. §12-5-30(a) (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	Rules for Water Quality Control r. §391-3-6-.16(3) (2001) www.ganet.org/rules/index.cgi?base=391/3/6/16
River Basin Management Program		Georgia River Basin Management Planning Act O.C.G.A. §12-5-520 et seq. (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	
Total Maximum Daily Load (TMDL) Program	Clean Water Act 33 U.S.C. §1313(d) , §1315(b) (2000) www.epa.gov/epahome/laws.htm		
Source Water Assessment and Protection Program—Wellhead Protection	Safe Drinking Water Act 42 U.S.C. §300j-13 (2000) www4.law.cornell.edu/uscode/42/00j-13.html 42 U.S.C. §300h-7 (2000) www4.law.cornell.edu/uscode/42/300h-7.html		Rules for Safe Drinking Water Act r. §391-3-5-.40 (1999) www.ganet.org/rules/index.cgi?base=391/3/5/40
Water Withdrawal Permit Program		Groundwater Use Act O.C.G.A. §12-5-96 (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm Georgia Water Quality Control Act O.C.G.A. §12-5-31 (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	Rule for Groundwater Use r. §391-3-2-.03 (1999) www.ganet.org/rules/index.cgi?base=391/3/2/03 Rules for Water Quality Control r. §391-3-6-.07 (2001) www.ganet.org/rules/index.cgi?base=391/3/6/07
Drinking Water Permit Program	Safe Drinking Water Act 42 U.S.C. §300g-2 (2000) www4.law.cornell.edu/uscode/42/300g-2.html	Georgia Safe Drinking Water Act O.C.G.A. §12-5-179 (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	Rules for Safe Drinking Water r. §391-3-5-.17 (1999) www.ganet.org/rules/index.cgi?base=391/3/5/17
On-Site Sewage Management System		Standards for Individual Sewage Management Systems O.C.G.A. §31-2-7 (2000) Georgia Water Quality Control Act O.C.G.A. §12-5-30(f) (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	Rules for On-Site Sewage Management Systems r. §290-5-26 (2000) www.ganet.org/rules/index.cgi?base=290/5/26 Rules for Environmental Planning Criteria r. §391-3-16-.02 (1999) www.ganet.org/rules/index.cgi?base=391/3/16
Erosion and Sedimentation Control Program		Erosion and Sedimentation Control Act O.C.G.A. §12-7-1 et. seq. (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	Rules for Erosion and Sedimentation Control r. §391-3-7-.04 (2001) www.ganet.org/rules/index.cgi?base=391/3/7/04
Floodplain Management Program	Clean Water Act 33 U.S.C. §701b-12 (2000) www.epa.gov/epahome/laws.htm		
Coordinated Planning Program		Georgia Planning Act O.C.G.A. §50-8-7.1(b) (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	Minimum Local Planning Standards r. §110-12-1-.04 (1999) www.ganet.org/rules/index.cgi?base=110/12/1/04 Rules for Environmental Planning Criteria r. §391-3-16 (1999) www.ganet.org/rules/index.cgi?base=391/3/16
Service Delivery Strategy Program		Service Delivery Strategy Act O.C.G.A. §36-70-1 et seq (2000) www.ganet.state.ga.us/services/ocode/ocgsearch.htm	

State Water Program Contacts

GEORGIA ENVIRONMENTAL PROTECTION DIVISION <http://www.ganet.org/dnr/environ/>

Water Resources Branch

Drinking Water Permitting and Engineering	Water Resources Management	Drinking Water Compliance
Drinking Water Permit Program: (404) 656-2750	Water Supply Watershed Program: (404) 656-3094 Water Withdrawal Permit Program: (404) 656-3094 Floodplain Management Program: (404) 656-6382	Source Water Assessment and Protection Program—Wellhead Protection: (404) 651-5168

Water Protection Branch

Engineering and Technical Support	Nonpoint Source	Watershed Planning and Monitoring
Wastewater Permit Program: (404) 675-6233 On-Site Sewage Management System—Class V Wells—Program: (404) 675-6233	Storm Water Permit Program: (404) 675-6240 Erosion and Sedimentation Control Program: (404) 675-6240	River Basin Management Planning Program: (404) 675-6236 Total Maximum Daily Load (TMDL) Program: (404) 675-1752

Geologic Survey Branch

Source Water Assessment and Protection Program—Wellhead Protection: (404) 656-3214

On-Site Sewage Management System—Class V Wells—Program: (404) 656-3214

GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS <http://www.dca.state.ga.us/>

Water Supply Watershed Program (404) 679-3114

Coordinated Planning Program: (404) 679-3114

Service Delivery Strategy Program: (404) 679-3114

GEORGIA DEPARTMENT OF HUMAN RESOURCES <http://www.health.state.ga.us/programs/envservices/index.shtml>

On-Site Sewage Management System Program: (404) 657-6534

The University of Georgia

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