Georgia's Water Future: Evolving toward Sustainability?

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We all know of water as a force of change, altering the landscape through slow, steady erosion and episodic, powerful floods. In the State of Georgia, over the past five years, we have seen water act as a different kind of force. Water, or more precisely, concerns about pending scarcity of water, have acted as a force for institutional change. Due to an uncommon coincidence of factors, the state's water management institutions are now shifting toward forms that, on the face at least, are more consistent with sustainable use of water resources.

Compared with much of the world, the eastern United States is a water-rich region. Georgia, for example, receives an annual average of 50 inches of rain statewide. Unlike the western United States, eastern water management institutions, including Georgia's, were established and developed in a climate of plenty. Over the last four decades, water management decisions were largely made in response to specific issues or needs. Systematic evaluation of resources and planning for long-term use was limited and on local or, at best, regional scales.

In recent decades, however, population growth, economic expansion, and changes in technology have markedly increased demands on the state's water resources. At the same time, regional differences in water resources and the way they are used have become more dramatic. Evidence of stresses and adverse impacts on the water resources in three regions of the state has emerged. In southeast Georgia, groundwater withdrawals have contributed to saltwater intrusion and a decline in water quality in some portions of a major aquifer. In southwest Georgia, ground and surface water withdrawals have combined to alter surface water flows in some watersheds. And, in the Atlanta metropolitan region in north Georgia, questions have been raised about the impacts of poor water quality on the region's economic future as well as the long-term viability of its water sources. Concerns about all of these factors, in turn, have been exacerbated by a series of major droughts and interstate litigation over water resources.

By the late 1990s, these factors began to raise broad-based concerns about growing stresses on Georgia's water resources and the potential for long-term water scarcity in some areas of the state. A legislative study committee ultimately resulted in legislation that authorized water planning with a scope not before undertaken in Georgia.[1]

Similar dynamics are evident throughout the eastern United States, and states have responded to these challenges with a variety of approaches to statewide and regional water planning.[2] Florida's response is perhaps the most comprehensive, where the state's regional water management districts systematically update water supply assessments and prepare regional water supply plans. In 2001, for example, four of the regional planning areas had resources that were deemed insufficient to meet 20-year needs and were required to submit plans to achieve the necessary water resource development projects.[3] A recent update showed some plans have achieved remarkable success in increasing capacity, while others outline actions that, if taken, will provide the area with enough water in 2025.[4]

Other states in the southeast are considering or proposing statewide water and regional planning processes. In South Carolina, a bill authorizing statewide water planning was recently introduced in the South Carolina General Assembly.[5] Legislators and stakeholders in Alabama have been exploring the options for statewide water planning "like Georgia's" but a study committee recently concluded they do not have enough data to submit a plan this year.[6]

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Georgia's experience with statewide water planning may prove to be instructive for similar initiatives in other states. Georgia's planning effort has resulted in significant changes in the state's approach to water management, changes that may ultimately lead to more effective long-term management of the state's limited water resources. This paper outlines significant aspects of the statewide water planning process, summarizes changes in management that are now underway, and highlights characteristics that may contribute to long-term sustainability of resource use and management.

Statewide water planning: Bringing users to the table

Georgia's Comprehensive Statewide Water Management Planning Act was adopted in 2004.[7] The act established a process for development of a plan led by the state agencies with major responsibility for water management, followed by consideration and adoption by the Georgia General Assembly.

The act required extensive stakeholder involvement in development of the plan. To meet this statutory requirement, a broad-based technical and public input process was conducted from June 2005 to December 2007 (Table 1). This process was more extensive and intensive than seen in many statewide water planning initiatives, and proved to be critical to water planning on a scale not previously attempted in Georgia. The linchpin of the process was a series of stakeholder advisory committees.

Advisory committee composition and process

The Comprehensive Statewide Water Management Planning Act established guiding policy for the statewide water plan: "*Georgia manages water resources in a sustainable manner to support the state's economy, to protect public health and natural systems, and enhance the quality of life for all citizens*" (emphasis added).[8] This statement required a broad planning scope, one that considered a wide range of potentially competing water uses: 1) offstream or extractive uses, where water is withdrawn and transported for human consumption, used in industrial processes, or applied for agricultural production, among others; and 2) instream uses that occur within the banks of a water body — assimilation of wastewater, recreation, hydrolelectric production, and support of fish, wildlife, and other ecosystem services.

The breadth of this planning scope required equally broad involvement in the advisory committee process. A desire to tap a wide range of interests was a fundamental premise in defining the advisory committees and determining their composition and process.

Differing geographic interests were involved through seven Basin Advisory Committees (BAC). Six of the seven were organized along river basin boundaries, with each committee's geographic boundaries encompassing one or more of the state's fourteen major river basins (Figure 1). A seventh committee represented the geographical area of the Metropolitan North Georgia Water Planning District, which was created by state legislation in 2001.

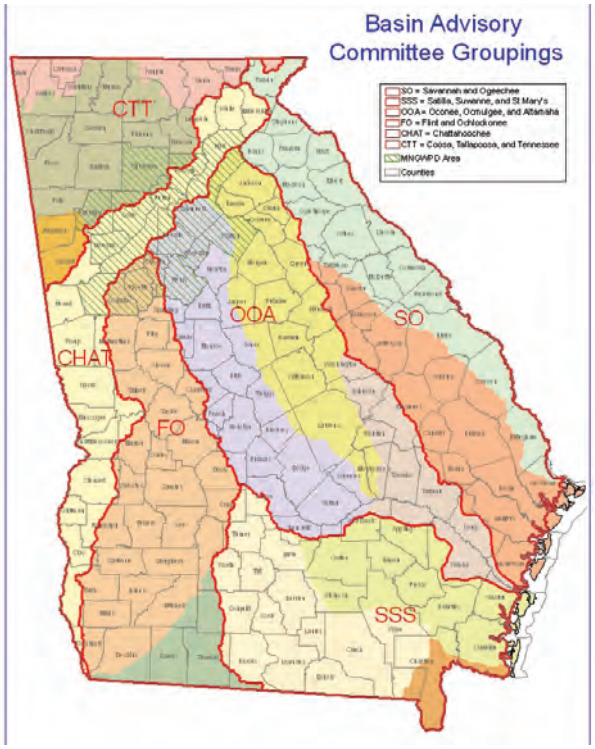
BAC members included representatives of local governments, business interests, agricultural concerns, environmental advocates, and other non-governmental organizations.[9] These committees were convened to provide structured regional perspectives and input on water management objectives and potential policy tools and/or options. The BAC were not asked to reach consensus on specific issues. The primary goal of the committees was to build a better understanding of divergent opinions and interests in the state's water resources. Attempting to reach consensus as a product may have precluded reaching this goal and, instead, members were simply asked to provide input from a diverse range of perspectives on proposed management objectives and policy decisions. The convening state agency worked with a wide range of statewide organizations, from economic developers to canoeing enthusiasts, to identify candidates for each BAC.

A Statewide Advisory Committee (SAC) brought together representatives of organizations that had statewide interests and constituencies, in order to

Table 1. Technical and public involvement process

Component	Description
Advisory committees	
— Technical	Four committees with a total of 45 members and 10 meetings
— Basin	Seven committees with a total of 187 members and 42 meetings
— Statewide	One committee with a total of 32 members and 8 meeting
Town hall meetings	Three rounds of meetings held around the state for a total of 22 meetings with attendance over 2700
Public meetings	Two rounds of public meetings/hearings around the state for a total of 18 meetings with attendance over 1000
Web-based review and comment on draft plans	Approximately 600 comments through an interactive website and 400 comment letters received by mail

Figure 1. Basin Advisory Committees used in development of Georgia's 2008 State Water Plan



provide structured statewide perspectives on water management policy tools and/or options. SAC participants were asked to speak for their entire organization, members of which occasionally had different and/or competing interests in various parts of the state. Membership on the SAC replicated the diversity seen in the BAC membership, with leaders from the environmental, business, industry, recreation, and agricultural sectors, and city and county government associations. Again, the intention of the SAC was not to build consensus, but to gather input from a broad range of perspectives to determine the correct course for water management in the state.

In order to gain as much input as possible in the time available, advisory committee meetings were led by professional, neutral facilitators. Each meeting focused on specific water management objectives or practices (e.g., meeting instream and offstream needs for water, maintaining water quality). BAC meetings on each set of topics preceded the SAC meetings on those topics.

Prior to each meeting, committee members received a discussion paper prepared by agency staff.[10] BAC meetings were structured to provide basic information on the topic and then garner opinions and comments on proposed policy options. Facilitators provided reports summarizing the discussion that occurred at the BAC meetings, which were, in turn, used to revise the proposed policy options for the SAC's consideration.

Input from the BAC often highlighted the topics or policy options that were particularly controversial. This input helped shape the agendas for the SAC meetings. In addition, because SAC members were primarily professional staff from statewide organizations, the committee could delve into specific proposals in greater detail. For example, due to the extensive amount of comment and concern over interbasin transfers and surface storage in the BAC meetings, those topics were given additional time and addressed at a separate SAC meeting. Similarly, a computer model designed to estimate the amount of water available for use without adversely affecting downstream interests, a critical element of water planning, received detailed attention in SAC meetings.

Advisory committee outcomes

One of the challenges that faced the advisory committees was meetings were not designed to build consensus on a given topic. Instead, facilitators solicited a variety of opinions on each management objective to help shape an acceptable management plan. Creation of the management plan reflected Georgia's need to change its framework for water management, turning from managing under conditions of plenty to managing finite capacities of water resources. With such broad representation on each committee, a goal of gathering information from divergent perspectives, and given competing interests for water resources, the possibility of reaching consensus on all objectives was low.

Despite this challenge, a mail survey sent to basin advisory committee members indicated a high level of satisfaction among participants. The survey was distributed to all basin advisory committee members approximately eight months after the process was completed and 35 percent of participants responded.[11]

Respondents indicated overwhelming satisfaction with the process itself. Of the survey respondents, 66 percent were mostly or very satisfied with the overall process. This result indicates BAC members were comfortable not seeking consensus. Simply having the opportunity to express their opinions about the management objectives, and exchange views with members from other sectors, was satisfactory for the majority of respondents.

Respondents overwhelmingly agreed the composition of their BAC was reflective of their region. More than 92 percent reported the membership balance on their specific BAC brought together the diverse interests in their watershed. However, there was frustration expressed in the lack of attendance on occasion and the tendency of some members to bring extreme views to the table.

Survey respondents reported the facilitated meetings were conducive to open and honest communications with 88 percent either agreeing or mostly agreeing with this statement. This statistic reflects an appreciation for the structure of the meetings and participants' ability to express their opinions and to hear those of others.

Members were allowed and expected to disagree, but that generally did not derail the discussions or impact respondents' ability to freely express their opinions.

The policy options proposed by agency staff were revised in response to multiple rounds of input from the advisory committees, and the working documents changed considerably over the 18-month course of advisory committee meetings. Among other specifics, discussion at advisory committee meetings emphasized the need for flexibility to adapt to differing circumstances in different regions of the state. Many also felt it was critical to maintain a full range of management practices as future options. At the same time, advisory committee members stressed the need for actions to ensure equity among different users, across different regions and river basins, and between upstream and downstream interests. Finally, advisory committee members strongly urged action be taken to fill information and data gaps *before* significant policy commitments are made. Revisions of staff proposals included provisions intended to address these major concerns as well as a number of specific issues.

This evolution in the content of the plan is reflected in responses to a final survey question about impact. BAC members who responded to the survey generally felt their input, meaning their comments and discussions about the water management objectives, was reflected in the final state water management plan. Sixty percent of respondents reported the BAC process had some or considerable impact on the final plan. Respondents generally felt the final management plan was responsive to the comments received and their comments and opinions were integrated into the final plan.

Results: Georgia's 2008 statewide water plan

In January 2008, a final Comprehensive Statewide Water Management Plan was submitted to the Georgia General Assembly. It was adopted by over 75 percent of the vote in both houses of the legislature and signed into law by the governor in February 2008. The high level of support among elected officials was due, in part, to the breadth of engagement and support built through the broad-based technical and public input process.

The final plan has three major elements that build toward more sustainable management of the state's water resources. The first is a series of resource assessments focused on water quantity and water quality. Assessments will be conducted following major hydrologic boundaries to evaluate, in a consistent manner statewide, the water available for use and the capacity to assimilate wastewater.

Water quantity assessments will estimate the capacity of individual water sources to provide water for use in a certain area while supporting other uses downstream or from that same aquifer. For surface water sources, the emphasis is on avoiding significant deviations from historic flow patterns and so, protecting downstream users. Water quality assessments will look from a watershed perspective at wastewater treatment levels that are required to protect water quality. These assessments are the first step in moving away from the first-come, first-serve system for permitting water withdrawals and wastewater discharges that has developed over the past few decades.

Resource assessments, in turn, provide the starting point for regional water planning, the second critical step in the evolution of Georgia's water management institutions. In a guiding policy statement, the State Water Plan recognizes the following: "*The characteristics of water resources and water users vary significantly in differing regions across Georgia. Protecting the ability of the state's water resources to meet needs for water supply and assimilation of wastewater will require regional, resource-based plans that identify the management practices appropriate to the resources and users in each region.*"

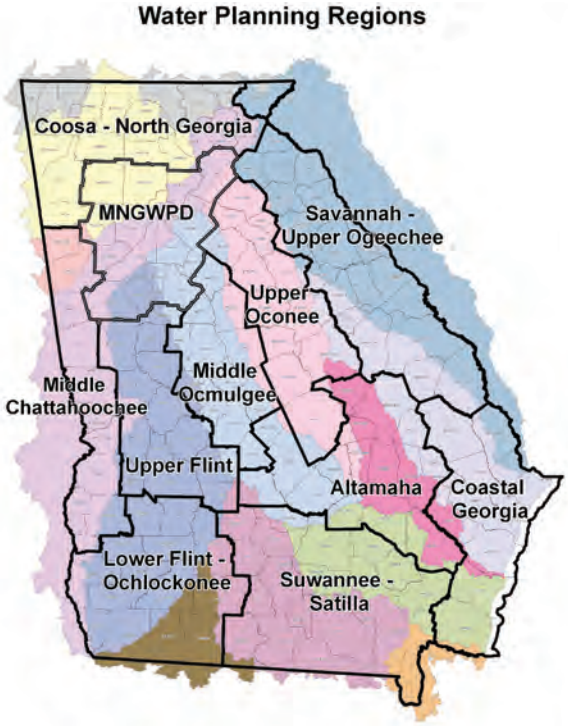
The State Plan then lays out a framework for development of regional plans that will span the entire state (Figure 2). As noted above, one regional water planning district was created in 2001, out of concern for growing demand and increasing stresses on water resources in the Atlanta metro area. The State Water Plan extends regional planning to all areas of the state, including those that do not yet have evidence of resource stress. It establishes ten Water Planning Councils to guide development of regional plans. Members are to be appointed by the governor, lieutenant governor, and speaker of the house and, collectively, councils are to be broadly representative of the water-related interests in the region.

Through regional planning, water management practices will be selected, specified, and laid out for implementation. The State Water Plan provides guidance on use of practices to manage water quality as well as water supply, including water conservation, surface water storage, interbasin transfers, and management of nonpoint source pollution, among others. Implementation of regional plans will primarily occur through actions at the local level and, once regional plans are adopted, state law requires water withdrawal permits and state grants and loans be consistent with their provisions.

Finally, state law and the State Water Plan require periodic review and revision of plans on a three to five year cycle. Regional plans are to include benchmarks for assessment of plan effectiveness and identification of necessary revisions. Periodic review and revision of the state plan and the regional plans enables adaptive responses to changes in water use, forecasted demands, and resource conditions.

Resource assessments are currently underway. Preparation of regional plans is expected to begin in earnest in spring 2009, following appointment of the

Figure 2. Water planning regions defined pursuant to Georgia's 2008 State Water Plan
Water planning regions are outlined in black; the state's major river basins are shown in color



regional Water Planning Councils. It is expected the first set of regional plans developed under the State Water Plan will be adopted in 2011.

Conclusions: Managing water for current and future generations

Increasing and competing demands for resources mean the water management challenges of Georgia's future are likely to be much more complex than those of today. Meeting these challenges will require more sophisticated management and use of multiple water sources, not just the cleanest, easiest, or cheapest.

The 2008 State Water Plan provides a blueprint that may, when fully implemented, help the state meet those challenges. It is designed to provide a flexible framework for regional water planning and to move toward sustainable management of water resources over a large area with diverse resources and widely varied interests.

The State Plan, and the process that produced it, have three fundamental characteristics that have been prescribed for more effective, long-term management of natural resources:[12]

- *Greater participation by resource users*. While public involvement during plan development had an immediate purpose (ensuring the plan submitted to the General Assembly was supported and therefore adoptable), it also served the purpose of building longer-term engagement with water users. This objective was accomplished by provision of multiple forums for input, by significant revision to the draft plan in response to public comment, and by specification of the regional planning framework.

  Creation of regional water planning councils, in turn, institutionalizes a set of new seats at the water management table. Stakeholder representatives can bring local knowledge into decision making. Interests with new seats at the table range from those in the large and medium urban areas in the northern and central part of the state, to those in the extensive agricultural areas in south Georgia, to those in the rapidly-growing counties along the coast.

- *Expanded communication and coordination in use of shared resources*. The plan structures interactions between regions and communities that share water resources and provides a framework for identifying regional solutions to water management challenges. In theory, at least, this framework will increase the recognition of water sources as shared resources: upstream, downstream, across state lines, and within and between regions.

- *Improved information on resource conditions and resource use*. The plan explicitly recognizes we cannot effectively manage what we do not measure, underscoring the importance of resource assessments and increased investment in information regarding resource capacity and conditions. Results of assessments, with on-going monitoring as regional plans are implemented, will enhance the information base available for future revisions of plans and the management practices they specify.

Together, these characteristics build toward adaptive management, a cyclical learning process based on monitoring and improved understanding of resource conditions and review and revision of management approaches.[13] And, they also build toward adaptive governance: governmental decision making about resources that involves affected parties in order to find an informed and stable consensus.[14] Accomplishing both, however, will require a long-term commitment and significant investment of public resources.[15]

Furthermore, the approach to regional planning currently being implemented in Georgia faces two fundamental challenges, which other states undertaking such efforts also face. The first is the ongoing challenge of involving the broad spectrum of water users and the representativeness of those at the table.[16] Participants saw the advisory committees that created the State Plan as reasonably representative, but questions have been

raised about whether this will prove to be true of the recently-appointed regional water planning councils.[17]

The second is the geography of regional planning. While resource assessments are to be conducted following hydrologic boundaries, regional planning for use of those resources will follow jurisdictional (county) lines rather than watershed lines. This approach reflects the reality of managing a system with natural and engineered features, but effectively marrying the two different geographies remains a challenge in regional planning.

For now, the long-run prognosis for changes in Georgia's water management institutions and the long-term outcomes that may result remain open questions. But, the experiment has been engaged, changes are underway, and the results will certainly bear watching.

ENDNOTES

1. The authors of this paper were actively involved in the statewide water planning process. As a policy adviser with the agency that led plan development, G. Cowie was among the core staff responsible for the project. As contractors to that agency, L. Askew and C. Tobin coordinated facilitation of the Basin Advisory Committees, were principal facilitators for the Statewide Advisory Committee, and assisted with public meetings.

2. See, for example, Pennsylvania Department of Environmental Protection, *Pennsylvania State Water Plan*, www.depweb.state.pa.us/watershedmgmt/lib/watershedmgmt/state_water_plan/background/2007_06_swp_update_info_sheet.pdf (accessed March 19, 2009) and Virginia Department of Environmental Quality, *State Water Plan*, www.deq.state.va.us/watersupplyplanning/statwat.html (accessed March 19, 2009). \

3. Florida Department of Environmental Protection, *Annual Status Report on Regional Water Supply Planning and Water Resource Development Work Programs 2003*, http://www.dep.state.fl.us/water/waterpolicy/docs/RWSP_ASR_2003.pdf (accessed March 19, 2009).

4. Florida Department of Environmental Protection, *Learning from the Drought, Annual Status Report on Regional Water Planning, August 2008*, http://www.dep.state.fl.us/WATER/waterpolicy/docs/learning-from-drought-final-report.pdf (accessed March 19, 2009).

5. South Carolina General Assembly, 118th Session, 2009-2010, H. 3132, http://www.scstatehouse.gov/sess118_2009-2010/bills/3132.htm (accessed March 19, 2009).

6. *International Business Times*, "Alabama State Legislators to Begin Writing Water Plan," http://www.ibtimes.com/articles/20080724/alabama-legislators-to-begin-writing-water-plan.htm (accessed March19, 2009) and the *Huntsville Times*, "More Water Data Needed for Plan, Panel Chief Says," http://www.al.com/news/huntsvilletimes/local.ssf?/base/news/1233137751314120.xml&coll=1 (accessed March19, 2009).

7. Official Code of Georgia Annotated §12-5-520 et. seq.

8. Official Code of Georgia Annotated §12-5-522

9. See Georgia Environmental Protection Division, Acknowledgements, "June 28, 2007 Draft of Georgia's Water Resources: A Blueprint for the Future," http://www.georgiawatercouncil.org/Documents/plan.html for a full list of members (accessed February 10, 2009)

10. Georgia Environmental Protection Division, *Georgia Statewide Water Planning: State Water Plan Development: 2005-2008*, http://www.georgiawaterplanning.org/Documents/background.html (accessed February 10, 2009).

11. Mail survey designed and conducted by L. Askew, C.Tobin, and R. Rawls, Fanning Institute, University of Georgia.

12. See, for example, Judith Innes, Sarah Connick, and David Booker, "Informality as a Planning Strategy," *Journal of the American Planning Association* 73, no. 2 (2007): 195-210; Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (New York: Cambridge University Press, 1990); Sandra Postel and Brian Richter, *Rivers for Life: Managing Water for People and Nature* (Washington, DC: Island Press, 2003); and Joanna Burger, Elinor Ostrom, Richard B. Norgaard, David Policansky, and Bernard D. Goldstein (eds.), *Protecting the Commons: A Framework for Resource Management in the Americas* (Washington, DC: Island Press, 2001).

13. Kai N. Lee, *Compass and Gyroscope: Integrating Science and Politics for the Environment* (Washington, DC: Island Press, 1993); Steven E. Daniels and Gregg B. Walker, *Working Through Environmental Conflict: The Collaborative Learning Approach* (Westport, CT: Praeger, 2001); and John T. Scholz and Bruce Stiftel (eds.), *Adaptive Governance and Water Conflict: New Institutions for Collaborative Planning* (Washington, DC: Resources for the Future, 2005).

14. Lawrence Susskind, "Resource Planning, Dispute Resolution, and Adaptive Governance" in *Adaptive Governance and Water Conflict: New Institutions for Collaborative Planning*, ed. John T. Scholz and Bruce Stiftel, 142 (Washington, DC: Resources for the Future, 2005).

15. Paul Sabatier, Will Focht, Mark Lubell, Zev Trachtenberg, Arnold Vedlitz, and Marty Matlock (eds.), *Swimming Upstream: Collaborative Approaches to Watershed Management* (Cambridge, MA: MIT Press, 2005).

16. Thomas Dietz and Paul C. Stern (eds.), *Public Participation in Environmental Assessment and Decision Making*, (Washington, DC: National Academies Press, 2008).

17. See, for example, *Athens Banner-Herald* editorial "Regional water councils will need close watching," www.onlineathens.com/stories/021709/opi_389644614.shtml (accessed March 19, 2009).