

DEVELOPING STATEWIDE WATER PLANS: NEEDS AND CHALLENGES

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Abstract. Many states have completed comprehensive water plans that address water supply, water quality and environmental needs. These are living documents that are periodically updated or given annual status reports. While the specific goals of these water plans are unique to each geography, they all share some common objectives such as providing for a reliable water supply, protecting water quality, enhancement of the natural environment, and ensuring quality of life for citizens. Preparation of these plans also shares some common challenges. These challenges have often included:

(1) institutional barriers; (2) costs; (3) water rights; (4) competition for water resources among urban, agriculture and the environment; and (5) public outreach and stakeholder involvement. Understanding these challenges and how they were resolved can be useful as the State of Georgia contemplates developing a statewide water plan. This paper will summarize the statewide water planning efforts in Texas, Florida, California, and Colorado. It will illustrate the needs for these plans and the challenges in developing them.

INTRODUCTION

Georgia is preparing to develop a Comprehensive Statewide Water Plan. Water plans from four other states suggest that there are many ways to approach water supply management. All four states face a water shortfall but each state has unique ways of approaching the problem that may, in part, be suitable for application to Georgia. Georgia may wish to review each state's approach particularly as it relates to funding, addressing environmental water supply, competition among users, public outreach and stakeholder involvement as it moves forward in developing its own statewide water plan.

TEXAS

In 1997, the Texas Legislature passed Senate Bill 1, a law that set water policy for meeting the water needs of a rapidly growing state. Sixteen planning regions were created across the state in order to overcome institutional

barriers; these were based on similarity of water sources, river basins and other factors. A Regional Water Planning Group in each of the 16 areas managed a study to identify water supplies and projected demands for the next fifty years assuming a record drought. The Regional Water Planning Groups have projected shortages of over 3 million acre-feet per year in Texas by 2050. Proposed water supply development and augmentation strategies included water conservation, development of surface and groundwater sources, implementation of wastewater reuse and desalination.

Over \$17 billion in improvements were recommended to resolve the projected water supply shortage. Current funding sources appear to be inadequate to address such a large cost. Texas is looking at a number of funding options including State Revolving Funds (SRFs), revenue bonds, and General Obligation (G.O.) bonds. In addition, the Texas Congressional Delegation requested a study on the potential for federal assistance with water supply in Texas.

The findings of the study of federal assistance are that the U.S. Army Corps of Engineers (Corps) cannot subsidize the construction of new water supply infrastructure. However, there are two approaches that may offer a solution. First, the Corps has the ability to reallocate space in its existing water reservoirs, using the space for water supply rather than some other purpose. The Federal government must be reimbursed for the full cost of that portion of the reservoir used for water supply; this is, in general, a "good deal" since an alternative supply may not be available or it may be very expensive. The Corps will only approve the reallocation of reservoir space if it is the least costly way to increase water supply.

Second, the Corps can be a participant in a "collaborative approach" or "shared vision planning". This approach means that the Corps, stakeholders, water utilities, and non-governmental organizations involved in water supply issues commit themselves to joint development of water supply solutions rather than proceeding individually in their roles as engineers and critics. The "shared vision planning" is important in Texas because transferring water from one area to another is possible from an engineering and economic standpoint

but difficult to achieve because of polarization of political and environmental viewpoints. Also, modifications to existing reservoir projects will require a Corps permit.

Other Federal agencies have an approach similar to “shared vision planning.” The permitting, delivery and level of Federal help might be improved by a Federal-state cooperative effort similar to the California Bay-Delta system known as CALFED. CALFED was initiated in 1994 to address environmental and water management problems including water supply. CALFED could serve as a model in terms of overcoming the fragmented Federal, state and local interests. Federal-state partnerships could streamline regulatory requirements for developing water supply through inter-district transfers, new storage and new conveyance infrastructure.

Unfortunately there is some uncertainty regarding the stability of long-term funding of the CALFED program. New federal priorities including the war in Iraq, global terrorism, and natural disasters may have put limits on funding the program similar to hesitancy in federal funding for Everglades restoration addressed below. In general, there has been a long-term decline in the amount of Federal grant assistance for local and regional water providers. Also, despite an increase in collaboration between agencies, it isn’t clear whether this collaboration will actually result in a streamlined regulatory process when it is time to move forward with water supply infrastructure construction.

FLORIDA

Similar to Texas, considerable competition exists for water in Florida. Forecasts of water withdrawals for the year 2020 show that Florida will need to increase its freshwater supplies from 7.2 billion gallons per day to 9.3 billion gallons per day in order to meet demands for Florida’s population increase. Population projections provided by the Department of Environmental Protection anticipate a 25 percent increase in Florida’s population, from 15.9 million residents in 2003 to approximately 21.8 million residents in 2020.

Florida developed its original Florida Water Plan in 1995 pursuant to Chapter 373.036 F.S. and recently revised it in 2001 as a severe drought was affecting the state. The primary purpose of the plan is to help the Florida Department of Environmental Protection (FDEP) and the various departments and offices of the FDEP organize their responsibilities and focus on the state’s highest water priorities. As a policy document, the plan:

- Identifies what FDEP regards as the priority water issues.
- States FDEP’s main strategies for addressing the priority issues.
- Focuses on accountability and performance measures.
- Emphasizes the use of watershed management to achieve the FDEP’s water resource protection goals,

and aids in the statewide development and coordination of the watershed management approach.

- Emphasizes the best use of current information technology to set priorities, assess effectiveness, and improve public access to data pertaining to protection activities identified in the plan.
- Seeks to strengthen partnerships with the water management districts and other parties.

What the plan does not do is describe the routine implementation of water programs in the state or to dictate the roles of the water management districts in Florida which carry out the primary mission of water supply management. Water management in Florida is carried out by five semi-autonomous water management districts created by the Water Resources Act of 1972. These districts are divided up based on surface water basins. Water in Florida is owned by the state and is allocated using a reasonable-beneficial principal. Water use permits are similar to “leases” of water by entities on a temporary basis; after permit expiration the water returns to the state.

These five districts are responsible for the management of water and land-related resources, water use, storm water management, development of surface water storage such as reservoirs and underground wells, the preservation of natural resources, fish and wildlife as well as the promotion of health, safety and general welfare. Funding for the water management districts comes from ad valorem taxes on real estate. These funds are additionally supplemented by other state and federal funds.

Water supply planning for the water management districts is generally dictated by the Florida legislature in Chapter 373, F.S. Each of the water management districts is required to develop a water management plan for water resources within its region. The district plans cover a 20 year horizon and are submitted to the FDEP which has general supervisory responsibility over the water management districts. On a routine basis, the water management districts may not necessarily consult the state plan but their performance in meeting the goals of the state plan is monitored by the FDEP through performance measures.

Florida has found that water demands in this fast growing state outstrip its available water supply, particularly in south and central Florida. Water is relatively abundant in the northern part of the state. Florida’s water shortage problems are primarily tied to adequate storage and distribution. Eighty percent of the population and public consumption of water is south of I-4, and approximately 80 percent of the water resources are north of I-4.

Water shortages first became common in the Tampa area and “water wars” were common during the 1980s and 1990s between Hillsboro, Pinellas and Pasco counties. Finally, utilities were taken over by Tampa Bay Water, a regional water supply authority, and a regional water system developed with considerable infrastructure

continuing to be built. Funding for a large ocean-water desalination facility was provided in large part by the Southwest Florida Water Management District. Tampa Bay Water has also built a large reservoir and surface water treatment plant to compliment its groundwater sources where pumpage is being reduced.

In the southern part of the State, the South Florida Water Management District has entered into an agreement with the Federal government to restore the Everglades. The original precursor to the water management district, the Central and Southern Florida Flood Control Project, was a federal-state partnership that was largely but not completely turned over to the state of Florida. Congress enacted the Comprehensive Everglades Restoration Plan (known as "CERP") under the Water Resources Development Act of 2000 as a framework for modifications to the Central and Southern Florida Project that are needed to restore the South Florida ecosystem while providing for other water-related needs of the region including water supply and flood protection. While intended to be a 50:50 partnership, the Federal government has not contributed at expected levels, particularly by comparison with the State of Florida. For this reason and because of the time-consuming Federal approval process for some 60 projects, the District has decided to push forward without Federal cooperation in the "Acceler8" initiative which will construct eight selected projects by 2010.

East central Florida including the Orlando area is also experiencing a significant deficit in meeting future water demands. A tremendous effort is underway to implement use of reclaimed water and to examine the feasibility of alternative water supplies such as desalination and aquifer storage and recovery. A major initiative of the St. Johns River Water Management District is to construct a major surface water treatment plant on the St. Johns River.

Because of the scarcity of water in primarily coastal areas and concerns by communities in water-rich area that water-poor areas would attempt to take their water, the Florida legislature passed a "local sources first" law. This law provides for the transfer of water across hydrologic boundaries, but only on the condition that the transfer does not diminish the availability of water for the present and future needs of the sending area. It also requires that the receiving area must have exhausted all "reasonable" local sources and options.

In addition, water authorities created under state law have become popular as a defensive mechanism to better protect available water supplies from more populated areas. Water authorities are also being set up to develop new water supplies and redistribute water so that it is more available in water short areas.

One of the problems in Florida is that there has not been enough integration of water supply and land use planning. Clearly there must be some limitation on the amount of growth that can reasonably occur based on the availability and cost of water. However, the quantification of

available water is elusive. At this time, local governments are planning future population growth without embracing the limitations of available water. The Florida legislature has indicated that local governments must take water management district water supply plans into consideration but consistency with the water supply plans is not a requirement. Local government land use decisions can come into conflict at the time of water use permitting for public supply when the water management district indicates that alternative water supply development may be necessary.

CALIFORNIA

In a way, the state of California presents a water supply and usage picture that is similar to Florida. In California about 70 percent of the stream flow lies north of Sacramento, and nearly 80 percent of the demand for water supplies originates in the southern regions of the state. Differing from Florida, more than 50 percent of the water consumed in southern California is imported from outside that region. The most pressing problem in California, as in Florida, is that sources of water supply do not align geographically with areas of demand.

Water planning in California since the 1950s has been framed by the first California Water Plan which was published by the California Department of Water Resources. Since then the California Department of Water Resources has prepared seven updates known as the Bulletin 160 series. The Water Code of California now requires the water plan to be updated every five years with the last one produced in 1998. An update entitled "California Water Plan – Update 2004" began in 2003 and a final report is scheduled for April, 2005.

The California Water Plan is the master plan which guides the orderly and coordinated control, protection, development, management, conservation and efficient utilization of the state's water resources. The recommended actions of the water plan will prepare California for a population of approximately 48 million by 2030 while considering problems related to extreme hydrologic events, global climate change, and protecting and enhancing the environment. It doesn't constitute approval for the construction of specific projects or the transfer of water. It doesn't provide for financial assistance by the state without further action by the legislature. The plan is also not to be construed as a prohibition of development of the state's water resources.

Public outreach is a challenge in California because of the large population of the state. The Department of Water Resources expanded the public forum for preparing the 2004 update to the water plan by including a 65 member advisory committee, a 350 member extended review forum, and a group of 2,000 interested members of the public.

The 2004 update (still in progress) of the California Water Plan:

- Presents actions that if implemented with assure adequate and sustainable water of suitable quality for all beneficial uses to the year 2030.
- Recommends ways to support local and regional planners to develop integrated resource plans and coordinate land use planning with water planning and management.
- Recommends ways to strengthen the state's public funding to protect and develop the water resources as a public trust.
- Outlines a process to improve water planning to make future updates more precise.
- Identifies needed science as well as research.
- Recommends ways to promote equity in state water planning, management and funding.

In the plan, regional reports have been prepared for each of the state's 10 hydrologic regions plus 2 overlay areas, the Sacramento-San Joaquin Delta and Mountain counties. Each report identifies major challenges, current programs and projects and the regional water status during each of three key years: a wet year, an average year, and the driest year.

The water plan addresses the uncertainties facing California in the next 25 years and describes three different future scenarios (rather than a "likely scenario"):

- Current Trends Continued – based on existing water usage trends
- Resource Sustainability – based on California becoming more efficient in using water while growing its economy and restoring the environment
- Resource Intensive – based on a highly productive California respectful of the environment; it assumes more people and lower water use efficiency

Perhaps unique to California, a significant linkage exists between water and energy management in California. Pumping, treating, and distributing water and wastewater consume approximately 10 percent of the State's total electricity. The State Water Project is the largest single user of electricity in the state.

The state of California sees its role as not only preparing the California Water Plan to guide development of the state's water resources but carrying on many other essential operations. These include operating and maintaining the State Water Project and forming public-private partnerships to implement regional programs and agreements with other states. The state must also participate in major regional initiatives with the Federal government such as the CALFED Bay-Delta Program. The state must also lead the effort to identify and prioritize funding strategies to finance regional and statewide water planning, programs, and infrastructure, and decide when to use public investments from state and Federal sources. The state also needs to continue to provide regulatory oversight to protect the environment as well as the health and welfare of the public.

Of note, California has employed a consolidated water allocation approach, called the California Drought Emergency Bank (Bank) during recent years in response to drought conditions in the state. This water bank is a statewide centralized water transfer mechanism. State law had been ineffective in implementing such transfers prior to the Bank, and, as a result, transfers had been costly and time-consuming, that led to the question as to whether transfers were administratively possible at all. The Bank was established and implemented by the Governor who appointed a "drought action team" and, with few exceptions the Bank has become the exclusive mechanism to transfer water. Operating under the requirements of a prior-appropriation state, the Bank served as an agency for the allocation of water resources by buying water from willing sellers and then reselling the water to interested users. This system has worked very well to move water to needed locations during drought periods.

COLORADO

Colorado also has some very close similarities with California and Florida in that the location of most of the water supply is different from the location of most of the water demand. The majority of urban and agricultural water demand occurs in the front range, where communities such as Denver are located. The majority of water supplies are located in the western slope of the state, where very small and rural communities exist. Balancing the needs of urban demands with agricultural water use and water needed for the environment and recreation has always been the challenge in Colorado.

In Colorado, all water is managed under the legal framework of the Prior Appropriation Doctrine, which has served its citizens well for over a century of growth and prosperity. Although it will continue to be the foundation for water administration and allocation for the foreseeable future, new forces and continued growth will likely require some new approaches to water management.

By 2000, Colorado was plunged into what would become the most serious droughts the state has ever faced since well before it became a state. By 2002, major reservoirs in the state were at record lows, and few have fully recovered. During this extended drought, municipal water providers all across the state were forced to implement fairly strict water use restrictions. Agriculture was also severely impacted by this drought, with significant cutbacks in water allocations. The environment and recreation also suffered as stream flows and lake levels were at record lows.

With the approval of the 2003 General Assembly, the Colorado Water Conservation Board (CWCB) commissioned Colorado's Statewide Water Supply Initiative (SWSI). Sensitive about a top-down, command and control approach, SWSI was not to be a statewide water plan in the strictest definition. Instead, SWSI took a grass roots, bottom-up approach. Specifically, SWSI

determined:

- How much water the state would likely need by 2030
- What was being planned by water providers to meet the current and future water demand
- How big, if any, was the “gap” between projected water demand and planned water supply projects
- What additional options were available to close the gap between supply and demand

SWSI’s mission was to identify and explore all possible solutions to meeting current and future demands under worst case drought conditions. These possible solutions included water conservation, rehabilitation of existing water supply facilities, and new water projects such as reservoirs, groundwater, and recycled water.

One of SWSI’s most ambitious tasks was to involve the major stakeholders within each of its eight river basins across the state. This occurred through facilitated meetings where urban, agricultural, environmental and recreational interests were present. Stakeholders were allowed to present their views on water management issues and SWSI itself. Stakeholders also helped develop a series of management objectives for SWSI that included:

- Sustainably meeting urban and agricultural water demands
- Optimizing existing and future water supplies
- Enhancing recreational opportunities
- Providing for environmental enhancement
- Promoting cost effectiveness
- Protecting cultural values
- Providing for operational flexibility
- Complying with all applicable laws, regulations and water rights

These management objectives were used to guide evaluations of potential water supply options as well as to develop policy guidelines. Stakeholders were also given the opportunity to comment on the entire SWSI process including calculations and evaluations.

SWSI was completed in 18 months, under an ambitious schedule and dozens of meetings across the state. Some of the major findings of the process included:

- Significant population growth, together with agricultural needs and an increased focus on the environment and recreation will intensify the competition for water
- Water supplies are not where demands are; localized shortages exist, especially in the headwater areas
- Water projects that local municipal and industrial water providers are implementing or planning to implement have the ability to meet 80% of Colorado’s urban water needs through 2030
- In-basin solutions can help resolve the remaining 20% gap, but there will be tradeoffs and impacts to other users—especially agriculture and the environment

- Water conservation is important and being aggressively implemented by some urban providers, but new conservation alone cannot meet anticipated gaps
- Beyond 2030, few water providers have identified new water supplies—thereby requiring more aggressive solutions
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CONCLUSIONS

Although each of the state water planning efforts explored in this paper was unique, there are some interesting similarities that can be useful as Georgia contemplates its statewide water planning.

First, involvement of stakeholders makes for a more acceptable and successful plan. Stakeholders in this context usually represent major water providers and special interests such as environmental, agricultural, and recreational. They should be engaged early on and through out the planning process.

Second, it is important to understand the hydrology and potential water demands. Decision support tools, databases, and other inventory methods should be invested in and maintained for efficient information sharing and analysis.

Third, it is important to understand state and local water laws and regulations. Water rights and allocations are often the most difficult issue facing statewide plans.

Fourth, it is desirable that state planning is done to complement local and regional planning, rather than take a top-down approach. This collaboration ensures that the plan is acceptable to the many stakeholders in the state.

Fifth, to the extent that remaining gaps or shortfalls exist between projected demands and planned water supplies, the state should facilitate ways in which barriers to project implementation can be eliminated. This will be unique to each state, but may include commissioning studies, providing funding or seeking funding partnerships, low-interest loans, coordination between local and regional interests, and assisting with regulatory issues.

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