

SURFACE WATER

Issue Definition

Major rivers, reservoirs and lakes have historically been tapped as the primary public water supply by utilities throughout the U.S. While as many as two-thirds of public water systems use surface water nation-wide, only 20 percent of Florida's residents are served by such surface water supplies today. Regardless, the large bodies of water that we do use have been sustained either by Mother Nature or through the efforts of man by constructing dams and other structures altering the natural flow of streams.

The past practices have, at times, resulted in serious damage to our water bodies. Consequently, the use of surface water for public water supply must be looked at in a broader context of environmental sustainability, reliability, water quality, treatment and economic impact if it is to be a true alternative in Florida.

Background

Surface water supply has traditionally been the major source of public water supply throughout the U.S. Major rivers, reservoirs and lakes are primary sources of supply and treated by public utilities in many states. But in Florida, surface water sources for public water supply have been relatively few. Only about 50 of the state's 6,000 public water systems utilize surface waters as their source (only 20 provide surface water treatment at their utility with the others being consecutive systems that purchase treated water from these suppliers). Groundwater has historically been the major resource used throughout the state for public water supply primarily due to its easy accessibility and low cost.

However, due to the state's significant population growth some coastal regions in Florida are now experiencing salt-water intrusion while inland areas are experiencing adverse ecological affects. Consequently, the need for development of environmental and economical sustainable alternative water supply alternatives in Florida is critical.

The hydrology and geography of Florida present challenges for the development of surface water supplies. The peninsular Florida weather pattern provides abundant rainfall in the summer months, but limited rainfall in the winter and spring months rendering some surface waters non-sustainable on a continuous basis. This natural climate pattern and a series of droughts during the decade have contributed to a loss of our historically available and adequate supply of both ground and surface waters. It has also adversely affected the water quality of our sources. The lack of continuous and reliable surface water supply has increased our attention and efforts to provide storage to maintain a sustainable supply. A key component to the sustainability of surface water supply is the development of water storage facilities to capture and store water during rainy times for use during dry periods. However, the geography of Florida is relatively flat, limiting the traditional construction of reservoirs or manmade impoundments. Other storage alternatives or non traditional design needs to be explored.

Issue Criticality for Water Supply

It is essential to develop a diverse, resilient, and interconnected public water supply system that is sustainable, reliable, safe and affordable. The development of surface water in Florida as an alternative supply is emerging as a critical component of public water supply systems. When integrated with other supply sources the creation of a diversified system can be managed on a resource basis. While surface water can be maximized during wet season conditions and storage relied upon during normal dry season conditions, a mix of alternative supplies should be considered, such as use of storm water, reclaimed water, brackish ground waters, aquifer storage and recovery (ASR), and sea waters. Also during more serious drought conditions when surface water would not be available and when stored reserves may be inadequate, these other alternative sources can help meet public water supply needs. Perhaps water supply needs a more flexible and diverse portfolio.

The full development of surface water supply as an alternative is dependent on multiple issues including the following:

Watershed Issues

State law requires the establishment of Minimum Flows and Levels (MFL) to prevent significant harm to water bodies that may be affected by water withdrawals. Withdrawal of surface water for public water supply must be compatible with the established MFL for the water body. Additionally, *and more specific to individual withdrawals, applications for water use permits must demonstrate “no harm” from the particular activity.*

Total Maximum Daily Load (TMDL) is the maximum amount of a given pollutant that a water body can absorb and still maintain its designated uses (e.g., drinking, fishing, swimming, shellfish harvesting). Water withdrawal for public water supply may provide an opportunity for reduction of the total amount of a given pollutant in the water body. Cleaner water through collaborative efforts of controlled withdrawal may be of benefit to the water body.

Over past decades lands throughout the state were ditched and drained to speed the removal of water from the site. This practice has altered the quantity and timing of the flow in the associated water body, as well as water quality. Restoration efforts to restore specific lands may provide opportunity for restoration of a more natural freshwater flow regime, flood protection, improved water quality providing both environmental and alternative water supply benefits.

Raw Water Quality

Surface water plants must provide high level treatment, including filtration and high level disinfection. Treatments can further employ sedimentation, coagulation, filtration or one of many membrane treatments, carbon adsorption, and Ultra Violet, Ozone or a host of other disinfection processes. More importantly appropriate watershed protection and the development of land use regulations need to be established and implemented to assure that raw water quality is not adversely impacted.

Storage

Storage is more challenging due to the unique hydrogeology of Florida. Two storage options have emerged: ASR wells and off-stream reservoirs. Both have potential issues and benefits

including cost, water quality, water loss, salt water intrusion prevention, land use and technological feasibility. The key to sustainability of surface water supply is the development of water storage facilities to store water during rainy times for use during dry periods. The harvest of seasonally available surface water resources protects the environment by withdrawing a science based percentage of the flow when it is abundant. The stored water resource is then available to meet public supply needs during dry periods to minimize withdrawal and reserving low flows for sustaining the ecosystem.

Florida 2030 Vision

It is essential to develop a robust water supply system that is sustainable, reliable, safe and affordable. Surface water supply will be a critical component of a resilient, drought-resistant, and interconnected water supply system and should be considered with a mix of traditional and other alternative water supply options. Furthermore, the use of any such alternative supplies must include a strategy to develop reuse and conservation and to promote increased regionalization along with other water efficiency strategies. When integrated with other source alternatives, such as brackish groundwater, ASR, reclaimed water, storm water, the resources can be managed from a resource sustainability basis. Surface water sources can be maximized in wet season conditions and storage relied upon during normal dry season conditions, allowing for the rotation of groundwater and surface waters resources to 'rest' or recover.

Options and Path Forward to Achieve FL 2030 Vision

Prior to determining the availability of water from rivers for water supply, MFLs need to be established to identify and protect water supply needs of natural systems. For surface water supply, water diversions would occur during periods of high flow with the majority of the diversions occurring for relatively short periods. Therefore, suitable storage mechanisms such as off-stream surface water reservoirs and ASR systems are required to hold water during wet times of the year for later use in the dry season.

Issues for Consideration

- Provide regulatory incentives to encourage local governments and water suppliers to coordinate water supply projects to facilitate.
- Development of conjunctive water permitting rules and regulations to provide for the integration of diversified sources into a resource management plan.
- Florida Department of Environmental Protection, Water Management Districts (WMD) and other stakeholders need to develop strategies that promote the development of conjunctive water supply systems that integrate surface water sources with groundwater and other alternative sources.
- Provide incentive based funding programs, such as WMD cooperative funding, Senate Bill 444 funding and specific legislative initiatives for the development of surface water treatment projects.