# Creating a Sustainable Water Supply for Central Florida: A Regional Strategy

## Recommendations

December 10, 2010

Urban Land Institute Central Florida

CONNECTING OUR COMMUNITIES myregion.org

# About this report

To: The Congress of Regional Leaders

In 2005, regional leaders asked the question "How shall we grow?" The landmark report of the same title, published in 2007, challenged public, private and civic organizations to work together to implement a shared regional growth vision. In 2008-2009, we looked at transportation. Today, as this report describes, we look at our water supply and two goals: what we can do, as a region, to ensure an economical, sustainable water supply for generations to come; and how we can avoid litigation over water issues that does not produce one drop of water to meet future needs.

Over the past year, we surveyed more than 1,000 stakeholders, from concerned citizens to local and regional water authorities, and consulted with thought leaders around the country on best practices.

We identified several opportunities and challenges, chief among them:

1. How do we share our resources equitably throughout the seven-county Central Florida region?
2. How do we encourage conservation without creating hardship for utilities with consumption-based bonds and budgets?
3. How do we make efficient use of alternative, but often more expensive, water sources that will be needed as the availability of groundwater diminishes?

These are difficult questions that produce predictably passionate responses. But they are questions we must answer. Scientists say that based on our current resources and consumption trends, Central Florida's water demand is at or near the sustainable groundwater supply. The initial forecast from the three water management districts that manage water consumption in Central Florida is that groundwater is available in the region through 2013. That forecast is likely to be extended because of the lower population growth resulting from the economic recession. Regardless of the date, it takes seven to 10 years to bring alternative water sources on-line. That means the time for action is now.

It's hard to foresee a day when taps would run dry in Central Florida. But one only has to look to the costly legal battles in California and Colorado to understand why a cooperative regional water strategy is essential sooner rather than later.

The average Central Floridian uses 100 to 150 gallons per day—more than half of that to wash cars and water lawns. Conservation is critical. But conservation is not the entire solution.

Alternative water sources are available, but bringing them on-line will require a high level of regional cooperation and coordination. The water management districts warned this day would come. Now, thanks to the vision of the *Congress of Regional Leaders*, this issue is being addressed.

The following report represents our recommendations for a regional strategy to create an economically sustainable water supply, based on the data we have collected over the past year. This report focuses exclusively on water supply issues. The Steering Committee recognized the need for a future discussion on water quality issues, trends and regulations. I hope you will read this report and use it as a ready reference as you prepare for our common future and whenever you ask yourself the question "How shall we grow?"

Sincerely,

**Jim Sellen**
Vice Chair
ULI Central Florida District Council

## About the Urban Land Institute

The mission of the Urban Land Institute (ULI) is to provide leadership in the responsible use of land and in creating and sustaining thriving communities worldwide.

Founded in 1936, ULI has more than 30,000 members worldwide, representing the entire spectrum of land use and real estate development disciplines, working in private enterprise and public service. ULI is committed to:

- **Bringing leaders together**
- **Fostering collaboration**
- **Exploring land use and development issues**
- **Advancing policies and practices**
- **Sharing knowledge**
- **Creating a global network with local impact**

## About ULI Central Florida

ULI Central Florida is ULI at the local level. Through District Council–sponsored educational forums and events, ULI Central Florida offers an unbiased, nonpartisan, and open exchange of ideas impacting land use and the quality of life in Central Florida.

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Established in 1999 and led by a group of public, private and civic leaders, *myregion.org* is encouraging unprecedented regional cooperation among community leaders to create a coordinated, comprehensive plan for Central Florida's future. By creating a shared 50-year vision for the region, *myregion.org* and its community partners are ensuring Central Florida's place in the global economy and improving opportunities for generations to come.

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The *Congress of Regional Leaders* includes 16 elected officials representing city and county governments and the school boards of the seven Central Florida counties (Brevard, Lake, Orange, Osceola, Polk, Seminole, and Volusia).

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# Executive Summary

Turn the tap and clean water comes out. It goes without saying—almost. But what if water weren't as readily available? Today, more than 25 percent of the world's population lacks clean drinking water. Scientists say Central Florida is close to the point of exceeding sustainable groundwater resources.

Central Florida has enjoyed an abundant supply of clean, affordable water from the Floridan aquifer, one of the world's largest sources of fresh groundwater, which lies deep underneath most of Florida as well as parts of Georgia, Alabama and South Carolina. However, a 2008 study by the St. Johns River, South Florida and Southwest Florida water management districts, which all oversee water use in parts of Central Florida, found that the availability of sustainable quantities of groundwater in Central Florida is insufficient on a regional basis to meet future demands. Under current water management regulations, groundwater allocations have been limited to the amount of water estimated to sufficiently meet the area's water demands through 2013. Even with the economic downturn resulting in lower-than-expected population growth, those allocations will likely only provide sufficient water for a few additional years beyond 2013. The water management districts are now evaluating groundwater regulatory limits as part of required rulemaking, and it is probable that long-term sustainable levels of groundwater withdrawal may be lower than now set in existing regulations.

> ***"The problem we face is how we should plan together as a region to conserve, reuse, and equitably apportion our water resources"***

Doing without water is not an option. Our quality of life, however, does not require the 100-to-150-plus gallons per capita, per day that Central Floridians currently consume.

### It's everybody's water

Seeking to avoid the kinds of turf wars that have led to costly water ownership litigation in other parts of the United States, the *Congress of Regional Leaders* – an organization of elected officials representing city and county governments and the school boards of Brevard, Lake, Orange, Osceola, Polk, Seminole and Volusia counties – retained ULI Central Florida and *myregion.org* to develop a regional water strategy. The stakeholder-driven, consensus-based project outcomes will assist Central Florida's elected officials and other decision-makers in planning and implementing equitable and mutually beneficial policies and strategies across the region. The project will also increase awareness of the water challenges in Central Florida and be a catalyst for change by building alliances across regional boundaries.

The project is being conducted in two phases. The first, the subject of this white paper, addresses water supply, demand and conservation. The second will focus on how to regionally address these challenges in an economically sustainable way.

## Problem Statement

Early in the process, it was determined that a consensus "problem statement" should be drafted as a way to communicate and measure the success of the project. It reads as follows:

> *"Although adequate sources of water in the form of groundwater, surface water (including seawater), and reuse water are available to meet Central Florida's future needs, each of these sources has limitations on its ability to provide an environmentally sound and economically sustainable water supply.*
>
> *The problem we face is how we should plan together as a region to conserve, reuse, and equitably apportion our water resources at a quality level sufficient to protect the environment and meet future population, business and industry, recreational and agricultural demands."*

## Context

In 2006 and 2007, *myregion.org* and nine partner organizations asked nearly 20,000 Central Floridians the question, "How Shall We Grow?" Through a series of "community conversations" looking at four possible development scenarios, the message was clear: Development trends threatened Central Florida's livability, environmental quality and competitive standing.

Participants embraced a different future focused on "4 Cs" – conservation, countryside, centers and corridors; a future in which Central Florida consumes less land, preserves more precious environmental resources, creates more distinctive places to live, and provides more choices for how people travel.

A critical issue emerged: How do we meet the water needs of future growth while protecting the environment?

Separately, in 2008, the three water management districts governing water use in the region – St. Johns River, Southwest Florida and South Florida – issued a joint statement for the Central Florida Coordination Area (CFCA) that sustainable quantities of groundwater were

### Central Florida Coordination Area (CFCA)

The St. Johns River, South Florida and Southwest Florida water management districts have concluded that sustainable quantities of groundwater in central Florida are insufficient to meet all future public water supply demands and that there is an immediate need to develop and implement supplemental water supply projects.

To address these issues, the three water management districts developed an action plan for formal coordination and communication where the boundaries of the three districts come together and where permitting actions in one district can impact water resources and water users throughout the area.

The CFCA includes: Seminole, Orange and Osceola counties, and south Lake County within the St. Johns River Water Management District; Orange, Osceola and Polk counties within the South Florida Water Management District; and Polk County within the Southwest Florida Water Management District.

insufficient to meet additional water demands beyond 2013 and that aggressive conservation, use of reclaimed water, and development of alternative water supplies were essential.

With the limitations on groundwater supply forecast after 2013 and the high potential for conflict over the remaining supply, the *Congress of Regional Leaders* made water its top priority and adopted two overarching goals:

1. **Create a regional water strategy for Central Florida**
2. **Avoid the use of any public money to litigate over water.**

In early 2009, the *Congress of Regional Leaders* unanimously agreed to retain ULI Central Florida and *myregion.org* to address these goals through the process and timetable described in this report.

In July 2009, *myregion.org* and ULI Central Florida assembled a Steering Committee of public and private-sector subject matter experts from Brevard, Lake, Orange, Osceola, Polk, Seminole and Volusia counties.

The committee conducted a series of stakeholder meetings in each of those counties between September 2009 and January 2010 to identify both common concerns and jurisdictional differences. Thousands of citizens voiced their opinions. While specific issues varied by county, a strong consensus emerged.

In July 2010, ULI Central Florida and *myregion.org* convened a blue-ribbon panel of water experts from around the country to share best practices and work with regional water leaders to draft recommendations to present to the *Congress of Regional Leaders*.

The information gleaned from the stakeholder meetings was compiled in a briefing book and used as a basis for discussion for this regional water strategy workshop and panel.

In August 2010, the group convened again for a half-day to polish its recommendations, which are the subject of this white paper. The bottom line:

1. **Water is undervalued.**
2. **Water users will not be able to use groundwater from the Floridan aquifer to supply all future needs without causing unacceptable environmental impacts.**
3. **Conservation must be an essential part of any regional water use strategy.**
4. **Alternative water sources are available, but at a much higher cost. Tapping them economically will require a substantial investment and a coordinated regional effort.**

The challenges ahead: How to reduce consumption to keep water demand within the capacity of our lowest-cost water resources, while building the infrastructure required to sustain us in the future; and how to accomplish this without placing an undue financial burden on utilities.

## Results

Actual workshop recommendations are covered, in detail, in the body of this report. Here are some highlights:

### Conservation/Education

- Focus on **outcome-based, cost-effective** conservation practices for all water-use categories, including self-supply, such as Florida-friendly landscaping, soil moisture sensors, and low-flow toilets.
- Implement and adequately fund **Conserve Florida** as a statewide clearinghouse for best management practices and data collection.
- **Provide consumption data** to water users to allow them to better monitor use and to encourage conservation.
- Develop a **coordinated communication campaign,** capitalizing on past efforts, to promote changes in behavior, with the goal of eliminating waste in water consumption.
- **Educate policy-makers and the public** with science-based information to help them understand and appreciate the value of water.

### Economics and Pricing

- Benchmark utility rates to **quantify correlation between price and consumption**.
- Use a tiered pricing structure to discourage excessive use and encourage conservation.
- Include **cost incentives for end-user conservation investments** in water utility budgets.
- Explore **collaborative funding for regional water supply development**.
- Dedicate a **percentage of water management district ad valorem revenues** for conservation/alternative supply projects.

### Alternative Water Supply

- Create **regional connectivity**, wherever possible, to maximize the efficient and cost-effective use of all available water sources.
- Continue to require **congruent land use/water use planning** so that utilities, local governments and water management districts work together to ensure concurrency and consistency.
- Develop **consistent, inclusive regional water use/planning policies,** keeping a regional focus.

## Summary Statement

As the steering committee reviewed the scientific data and policy opinions compiled over the past year, an overarching strategy emerged. The Floridan aquifer alone is not sufficient to meet Central Florida's future water needs. While conservation may buy a little more time, it typically takes seven to 10 years to place a new water source on-line, and this is longer than the current projected availability of new groundwater development.

Policy-makers and the public need to be educated on the consequences of failing to act. Designing and building an interconnected regional water supply that taps all available alternative water sources will require time and resources. Regional leadership is essential to effectively address these regional water supply issues.

Additional water resources will come at a higher cost than the inexpensive groundwater Central Floridians have come to expect.

That cost can be mitigated through a combination of voluntary conservation, retrofit incentives, and tiered pricing designed to discourage waste. This all-of-the-above versus an *á la carte* approach, in the committee's opinion, represents Central Florida's best hope for a sustainable water supply that will serve the region for generations to come.

> *"Spending money on litigation doesn't produce a single drop of new water."*
>
> —Bill Segal, Orange County Commissioner

It is the recommendation of the more than 1,000 stakeholders involved in this process that regional leaders act with utmost speed to avoid litigation and ensure an economically and environmentally sustainable water supply. The *Congress of Regional Leaders* has already identified this as the area's top priority.

No one entity has the ability to implement all of these solutions alone. The next step is to look at the civic architecture that will be required for the region to address these recommendations cohesively.

The task of the each member of the *Congress of Regional Leaders* is to continue building agreement in all jurisdictions that these are the right recommendations and that the region should move forward.

# Background

Strategic planning for future water needs emerged as a high-priority issue among citizens, stakeholders and community leaders during the *myregion.org* "How Shall We Grow?" community visioning process for Central Florida. Regional vision and leadership was considered an essential precondition for success as Central Florida plans for a population that is projected to increase from 3.7 million in 2010 to 6.6 million by 2050.

### Regulation of Water Use in Florida

Water use and regulation have changed rapidly in Florida as the human population has grown and primary water sources have shifted from groundwater to surface water. A host of public agencies oversees water planning and regulations in Florida, including local municipalities, counties, regional water management districts, regional planning councils, and state agencies such as the Florida Department of Environmental Protection, the Florida Department of Health and the Florida Department of Agriculture and Consumer Services. Florida is fortunate to have a diverse, dedicated and highly trained network of regulatory agencies, stakeholder associations and water utilities (public and private) that help to shape and enforce water policy and regulations in Florida. This diversity can also create challenges. While these agencies operate under the same state and federal laws, it is not uncommon to see regional and agency inconsistencies in both interpretation and enforcement of existing laws.

### Water Demand and Consumption

The three water management districts in the Central Florida region have jointly concluded that the availability of sustainable quantities of groundwater in Central Florida is insufficient on a regional basis to meet future demands. Under current water management regulations, groundwater allocations have been limited to the amount of water estimated to sufficiently meet the area's water demands through 2013. Even with the economic downturn resulting in lower-than-expected population growth, those allocations will likely only provide sufficient water for a few additional years beyond 2013. The water management districts are now evaluating groundwater regulatory limits as part of required rulemaking, and it is probable that long-term sustainable levels of groundwater withdrawal may be lower than now set in existing regulations.

## Water Use Statistics

Daily indoor per capita water use is 90 gallons. Here is how it breaks down:

| Use | Gallons per capita | Percentage of total daily use |
|---|---|---|
| **Showers/baths** | 32.5 | 21.7% |
| **Clothes washers** | 15.0 | 10.0% |
| **Dishwashers** | 1.0 | 0.7% |
| **Toilets** | 18.5 | 12.3% |
| **Leaks and other domestic uses** | 12.0 | 8.0% |
| **Faucets** | 11.0 | 7.3% |
| **Outdoor/irrigation** | 60.0 | 40.0% |
| **Total** | **150** | **100%** |

By installing more efficient water fixtures and regularly checking for leaks, households can reduce daily per capita water use by about 43.5% to about 48.7 gallons per day. Here's how it breaks down for households using conservation measures:

| Use | Gallons per capita | Percentage of total daily use |
|---|---|---|
| **Showers/baths** | 20.0. | 25.6% |
| **Clothes washers** | 10.0 | 12.8% |
| **Toilets** | 6.4 | 8.2% |
| **Dishwashers** | 0.7 | 0.9% |
| **Leaks and other domestic uses** | 1.6 | 2.0% |
| **Faucets** | 10.0 | 12.8% |
| **Outdoor/irrigation** | 29.4 | 37.6% |
| **Total** | **78.1** | **100%** |

## Natural Conditions

Central Florida's rainfall is highly variable and unpredictable. Complex regional weather patterns in conjunction with long-term global climate factors will continue to be a challenge for Florida's water managers. While average rainfall appears to be abundant, Central Florida experiences severe and prolonged periods of drought as well as episodes of intense rainfall and floods.

On average, Central Florida receives between 50 and 54 inches of rain annually with at least half of it occurring during the wet summer months. Intense afternoon thunderstorms accompanied by wind and lightning are frequent. These rains can be geographically localized and often of short duration. Extreme rainfall events can occur during tropical storms.

***On average, 70% of Florida's rainwater returns to the atmosphere through evapotranspiration, 20% goes into surface water bodies and wetlands as runoff, and 10% percolates into the ground to recharge wells and aquifers.***

On average, 70 percent of Florida's rainwater returns to the atmosphere as evapotranspiration to the atmosphere, 20 percent goes into surface water bodies and wetlands as runoff, and 10 percent percolates into the ground to recharge wells and aquifers. Significant quantities of freshwater are discharged as stormwater to coastal waterways and lost to tides. The amount of rainwater that infiltrates the ground and recharges aquifers is influenced by precipitation, soil infiltration rate, sediment characteristics, geology, relationship of surface water bodies to surficial sediments, and land use patterns. The majority of recharge to the Floridan aquifer system occurs in the areas where it is unconfined or semi-confined in amounts of approximately 10 to 25 inches per year, whereas in the areas of confinement the recharge is less than 1 inch per year.

## Water Cost Structures and Rates

Each water utility in Central Florida has a different customer base and economic conditions within its service area that influence water cost structures, rates and usage habits from its customers. Without consideration of other outside variables that change a customer's water-use habits, it is assumed that as the price of water increases, demand or consumption will decrease. If the price of water is set too high, there could be too few gallons consumed to recover the revenue requirement. This could lead to an unintended consequence where efforts to encourage conservation could cause upward pressure on rates. The challenge to water utilities and managers will be to balance the desire to discourage waste and promote conservation with the need to deliver affordable rates.

## Projected Future Conditions

Florida water managers must address some emerging and complex impacts to water resources that compound the fundamental challenge to meet the water needs of a growing population. These challenges include understanding a range of issues that influence residential, industrial

and agricultural water use trends; local and regional impacts to water resources from global climate change; impacts of global sea level rise and resulting saltwater infiltration into groundwater and freshwater resources; and water quality impacts from a growing list of water pollutants, including nutrient over-enrichment and harmful algal blooms to new contaminants of emerging concern.

### Conservation

In this region, utilities have undertaken various water conservation initiatives for decades in order to encourage the efficient use of water. However, water conservation efforts from all stakeholders must be increased to address water sustainability. Utilities have long promoted water conservation as "the right thing to do." Water management districts have added teeth to the effort with mandatory lawn watering restrictions. With average per capita consumption still in the range of 100 to 150 gallons a day, however, there is still much that can be done – by mandating smart irrigation technology, encouraging environment-friendly landscaping, and promoting the replacement of old appliances and fixtures with newer, more water-efficient models. And even then, conservation alone will only serve to push the immediate problem into the future, when it will be more expensive to fix.

### Water Supply Alternatives

In addition to the aggressive conservation of existing supplies, alternative water sources have been identified to meet the anticipated needs of a diverse and growing Central Florida population. Alternatives include: rainwater capture, stormwater reuse, wastewater reuse, desalination, surface waters, aquifer storage and recovery, and non-traditional groundwater supplies. Each water supply alternative has limitations on its ability to provide an environmentally sound and economically sustainable water supply to meet future needs. Comprehensive risk assessment and alternative water supply feasibility studies are essential for developing a comprehensive, long-term and sustainable water strategy for the region. Communicating the value of water and the need for solution-based decisions, education and outreach are effective techniques. Recognizing that water is undervalued today and each of these alternatives will generate additional costs, maximizing the return on investment is imperative.

## The Process

Most people don't stop and think about water during the course of a normal day. So ULI and *myregion.org* asked area leaders to do just that. In a series of stakeholder meetings, they solicited county-by-county feedback on issues local residents, businesses and governments face when it comes to water. Leaders in each county shared what they are already doing to conserve water and oversee its use.

The meetings took place in late 2009 and early 2010:

- **Brevard County** – September 29, 2009
- **Volusia County** – October 22, 2009
- **Lake County** – November 4, 2009
- **Osceola County** – November 5, 2009
- **Orange County** – November 10, 2009
- **Polk County** – December 8, 2009
- **Seminole County** – January 25, 2010

Each meeting gathered that jurisdiction's elected officials from municipal, county, state and federal offices, along with water experts and other leaders. There were 86 municipalities and three water management districts in all, each with a unique point of view. The goal: Find common ground to lay a foundation for regional cooperation.

At each meeting, the discussion focused on a simple exercise with this directive:

> *It's the year 2050 and Central Florida is recognized as an international leader in managing its regional water supply in an environmentally and economically sustainable way. What did the region do to:*
>
> - Provide for an environmentally and economically sustainable supply of *ground water*?
> - Provide for an environmentally and economically sustainable supply of *surface water*?
> - Provide for an environmentally and economically sustainable supply of *reuse water to reduce overall demand*?
> - *Reduce demand for water* in an environmentally and economically sustainable manner?

The results were telling. Although all jurisdictions shared some common concerns and strategies, each group presented a distinct picture of that county's challenges. ULI and *myregion.org* created a matrix comparing key indicators county by county. That matrix has been included in the Appendix section of this report.

The exercises had one overriding purpose: to identify best practices that balance both regional and local needs. Surely some practices would rise to the top across geographic borders and command the region's focus. In fact, some best practices from outside the area – from Tampa Bay or as far away as California, Arizona and Colorado – could apply to Central Florida.

"We know this is a daunting task," Florida Sen. Lee Constantine, R-District 22, told leaders gathered in Seminole County.

The next step was to convene the Regional Water Strategy Steering Committee and review the findings of the stakeholder meetings. On February 22, 2010, the group met at the Chamber of Commerce in downtown Orlando.

First on the agenda: Agree on the "Central Florida Water Problem Statement," a vision statement that would keep the region focused on the issue at hand and prevent well-meaning participants from verbally wandering down paths that would prevent them from reaching consensus in the coming months.

With that task completed, the group planned its next major undertaking: a workshop that would bring in some of the best and brightest minds in water issues, put them together for two days, and challenge them to create recommendations to advance a regional water strategy.

The workshop took place July 15 and 16, 2010, at the University of Central Florida Executive Development Center in downtown Orlando. Participants included not only local specialists but also experts from other parts of Florida and the United States.

Uninterrupted by the outside world, participants debated ideas and concepts, then strategies, then sentences, and finally words. They created specific best practice recommendations in five areas:

- Conservation and Environment
- Education and Outreach
- Design and Development
- Economics and Pricing
- Alternative Water Supply
- Other Considerations

With those recommendations in hand, the Regional Water Strategy Steering Committee reconvened on Aug. 17, 2010, to consider each recommendation carefully, discuss how to bring it to a local level, and create a final list of recommendations to present to the Congress of Regional Leaders.

The committee's final recommendations create the basis for this white paper. Each recommendation will be examined in depth in the following sections.

# Recommendations

What will it take to make sure Central Florida has clean, affordable drinking water for generations to come? There is no single solution. In fact, it will take a collection of solutions, carefully carried out in conjunction with one another, to stretch the current water supply even as the region looks for alternative ways of providing this precious resource in the future. No one entity has the ability to meet its future water needs on its own. Achieving this goal will take a level of regional cooperation that is rare but extremely effective.

These were perhaps the most significant findings of the research that led to the recommendations in this report: that Central Florida's best option is to choose *all* of its options and coordinate them. The recommendations work best as essential parts of a single plan.

The action items recommended here are both practical and progressive. In general, they fall into two categories: those that can be carried out today, with little or no capital investment, such as decreasing individual water use through education; and those that will take additional infrastructure and money, such as building a desalination plant that converts ocean water into drinking water.

Naturally, the recommended immediate actions start with ideas that are easiest to implement – the conservation of water on a personal and regional level. The second set of ideas includes transformational incentives and disincentives – such as premium pricing for above-target consumption – and education to ensure that water is no longer undervalued, but perceived by consumers as a precious resource essential to our continued existence. The third set of recommendations addresses longer-term solutions, such as regional connections and cooperative agreements that will be needed to expand Central Florida's water supply.

### Conservation and Environment

Everyone could be doing more to conserve water. The recommendations in this section include measures individuals, businesses and government bodies can take to stretch the current available water supply so it will last longer. By following these recommendations, the region can buy itself more time to make the major investments that will be required to replenish or supplement today's water sources with high-quality, affordable alternatives.

- **Create consistent, standard methodology for how all water suppliers/users report their use for water management district review.**

  In essence, this would level the playing field. To have regional cooperation, a common measure is essential. In their discussions on this topic, water experts said this measure would be even more effective if it were adopted statewide.

- **Establish a meaningful water consumption target by utility service area to set meaningful water conservation goals, ensure accountability, and reduce water use in Central Florida.**

  This could be accomplished in various ways, but one of the most equitable might be to consider numeric goals by water use category. Utilities could divide customers into

distinct user groups to identify reasonable water use targets and/or percent conservation reduction goals.

- **Increase the use of outcome-based conservation practices, continue to include requirements in consumptive use permits, and apply to all users, including domestic self-supply.**

  There are many ways to achieve this. Some of the methods discussed included: drought-tolerant plants and grasses, such as those currently listed in Florida-Friendly Landscaping™; smart irrigation technology to detect when watering is required; and low-flow toilets, which are relatively inexpensive and use less water per flush.

  Several ideas fell under this category, including exploring methods by which property owners could be required/incented to retrofit to low-flow fixtures and appliances when a property changes ownership.

- **Require cost-effective conservation practices for all water use categories.**

  It's easier to encourage and regulate water users who are on a municipal system. They can receive conservation tips in their water bills, or though websites such as Orange County's *www.occonservewater.net* (Appendix II, Example 1), along with higher rates for not complying. But what about self-suppliers, those using private wells or community-run water systems? There has to be a way to monitor and regulate those as well.

  It wouldn't be fair, after all, for a resident who's on city water to cut back on irrigation and then look across the street and see a neighbor watering the grass every day out of a private well. Conservation practices have to be uniform to be widely accepted and effective.

- **Provide water use data to end users to encourage good habits.**

  There are many ways this could be done. One example is the Gainesville Green initiative in Alachua County. *http://gainesville-green.com*. (Appendix II, Example 2)

  Just as importantly, residents can use the website to compare their use with that of their neighbors. This gives Gainesville Green the ability to become sort of a peer watchdog vehicle that employs a user-enforced web community similar to those that congregate on eBay, Wikipedia and LinkedIn.

- **Document all conservation best management practices over time and evaluate data to determine progress.**

  The group suggested doing this through the Conserve Florida Water Clearinghouse, a best-practices repository funded by the Florida Department of Environmental Protection, the regional water management districts, utilities, and the American Water Works Association. Committing to this would involve helping the clearinghouse receive funding and carry out its mission, goals and objectives (Appendix II, Example 3).

- **Ensure that conservation efforts by all users do not result in penalty to the water supplier through a reduction of water allocation from the water management district.**

  Of all the recommendations considered, this one was among the most controversial, because Florida water law, Chapter 373 of the Florida Statutes, does not permit the "banking" or "reservation" of water by permitted users. However, providing security to reduction in future permit allocations can be accomplished by structuring long-term consumptive use permits to anticipate both future growth in demand through the addition of more water users and the reduction of consumption by each user through measurable conservation strategies. Water Management District consumptive use permits should allow water saved through conservation to be used to meet the needs of future growth. If necessary, changes to rules governing consumptive use permits to accomplish this goal should be considered.

- **Modify local government codes to encourage drought-tolerant landscaping.**

  Opinions on what constitutes "Florida-friendly" landscaping vary. Given the fact that there are 86 government bodies in Central Florida, along with three water management districts, the committee recommended adopting the definition used by the University of Florida in its trademarked Florida-Friendly Landscaping™ Program (Appendix II, Example 4). Water conservation through landscape design should require use of "drought-tolerant" plants and grasses that need an absolute minimum of irrigation, or no irrigation at all. These plants and grasses are readily available and can be identified by selecting those species requiring the least irrigation from the suite of plants currently identified as "Florida Friendly" by the "Florida Yards and Neighborhoods Program" (www.floridayards.org). Other reliable recommendations for plants and grasses that do not need irrigation can be obtained from the Florida Native Nursery Association (www.afnn.org).

- **Require the water management districts in the Central Florida Coordination Area to adopt, by rule, policies for the consumptive use and management of water that incorporate conservation goals, metrics, and projects.**

  This would apply to every utility. No utility would be exempted, regardless of size.

- **Revisit/update laws and rules governing domestic self-supply and residential irrigation wells, as applied by the water management districts and the county branches of the Florida Department of Health.**

  The use of domestic self-supply wells and residential irrigation wells has increased to the point where self-supply represents a significant impact on the groundwater supply. The committee recommends that laws and rules governing self-supply be updated to reflect this impact and increase governance accordingly.

- **Modify Chapter 373, of the Florida Statutes such that when local governments desire to institute more restrictive conservation measures, such measures should not be considered a preemption.**

**Education and Outreach**

In the general public, there is a disconnect between perception and reality when it comes to the value of water. It has always been relatively easy and inexpensive to get water in Central Florida, so there is no sense of urgency yet among residents and businesses.

This gap of knowledge is a challenge for leaders who are pushing for conservation and eventually will need voter support to pay for alternative water sources. Science-based knowledge is an essential foundation for smart, outcome-based decision-making.

Among the recommendations aimed at educating stakeholders on the issues:

- **Develop and implement a regional coordinated campaign strategy to educate consumers on the value of water and promote simple behaviors that reduce water use.**

  The campaign components may involve several steps and methods of delivery:

  - Educate consumers on the value of water.
  - Educate and work with local media to spread messages on water use and alternative water supply.
  - Incorporate outreach through homeowners associations.
  - Educate homeowners on Florida-Friendly Landscaping™.
  - Include educational outreach to K-12 students.
  - Adopt a conservation program for the hotel/motel industry.
  - Address industrial, commercial and institutional water use.
  - Work with landscape professionals, nurseries and home improvement stores to educate homeowners on simple, effective landscaping choices.
  - Educate consumers on the cost-saving aspects of good choices and the risks associated with bad choices.
  - Educate consumers on rate increases associated with conservation.
  - Educate business leaders/owners on issues and importance of efforts.
  - Provide ongoing education to elected officials in the region, planning around the election cycles and natural attrition that contribute to turnover.
  - Educate the public and the construction industry about the Florida Water Star Program (Appendix II, Example 5).

- **Develop a communication plan to educate key audiences about the water problem first, then communicate the science-based solutions.**

  The plan may involve several steps and methods of delivery:

  - Promote one-stop resources for local governments to obtain information and materials, such as Conserve Florida, the University of Florida Institute of Food and Agricultural Sciences (IFAS), and the individual water management districts.
  - Encourage certification and education for landscape professionals.
  - Publicize simple but dramatic steps the region takes to conserve water, such as plugging any remaining free-flowing artesian wells, automating meter reading systems, and providing cost-effective retrofitting of equipment, such as toilets.

- **Unite stakeholders in support of a regional water strategy for Central Florida.**

  Components of a unified strategy may need to be tailored to specific stakeholders, such as those in agriculture, utilities or government.

### Economics and Pricing

Charge more for water and people will use less. That's simple economics. How much more, and how to fund operations and infrastructure improvements in a low-flow environment, are important questions that need to be addressed. In discussing this topic, the committee specified that all pricing and rate recommendations included here are based on residential rate structures.

- **Conduct a survey across the region to compare and evaluate how utilities are using rate structures to promote conservation.**

  Looking at this issue also involves looking within the region to identify optimal rate structures and their correlation to water use. The region should gather and analyze existing data available from sources such as the water management districts, the public utilities and the universities to quantify the correlation and price elasticity between rate structures and residential water use.

- **Continue to use tiered rates to discourage waste of resources.**

  Tiered rate structures, with significantly higher rates for above-target consumption, have proved to be effective at reducing water use. The tiered structure promotes water conservation while providing affordable water for basic domestic needs. The committee recommended implementing more aggressive pricing on above-target consumption to encourage water conservation.

- **Utility rate structures should provide sufficient revenue to allow the utility to finance incentives to retrofit customers' homes and businesses with devices and equipment for water conservation (indoor/outdoor) and use of reclaimed water.**

  Provide incentives and pursue funding to retrofit homes and businesses with water conservation devices (indoor/outdoor). Also provide incentives for retrofitting existing homes and businesses to use reclaimed water. It is important to note that in pursuing retrofits, public utilities face cost-benefit and equity issues. The committee felt strongly that incentives should be equitable across water management districts.

- **Establish policies related to regional collaborative alternative supply development.**

  These could include financing incentives provided by the water management district. Establish more consistent and standardized policies (legislatively if necessary) among the water management districts related to permitting processes, funding and regional collaborative alternative water supply development.

- **Adopt inflationary escalation adjustment to rates.**

  Avoid large rate increases by gradually increasing rates over time to provide funding for future projects and decrease financial risk exposure to stakeholders.

- **Restore statewide funding for alternative water supplies to the water management districts.**

- **As a region, take advantage of federal, state and other funding opportunities available through grants/matching funds to fund regional water supply projects.**

  Require water management districts to dedicate a reasonable percentage of ad valorem revenues for conservation programs and development of alternative water supplies. This could be one-tenth of a mil, for instance. The percentage should be equitable across water management districts. Legislation might be needed to accomplish this.

**Alternative Water Supply**

It is clear the region needs to build a diverse water supply that will provide adequate, economical, quality potable water to the region at the lowest possible cost.

**Sources:**

- Brackish groundwater
- Gray water – untreated wastewater that has not come in contact with toilet waste (i.e.: shower, sink and washing machine waste), suitable for reuse on the property where it is collected
- Lower Floridan aquifer, where it's sufficiently separated from the upper Floridan aquifer
- Process waste streams – water captured, processed and reused as part of a commercial process, such as by manufacturers or commercial car washes
- Reclaimed water
- Seawater
- Stormwater
- Surface water
- Surficial, or shallow aquifer

There are numerous technologies and methods that would involve more infrastructure, and therefore more funding, to implement. These would have to be developed strategically within the region.

**Technologies:**

- Aquifer storage and recovery
- Conjunctive use, such as surface water/ground water interfaces
- Credits or offsets to traditional sources
- Desalination
- Direct and indirect aquifer recharge
- Irrigation with stormwater and reclaimed water
- Off-stream reservoirs

- Potable reuse
- Rapid infiltration basins
- Regional systems /interconnects and land use transitions
- Saltwater intrusion barriers
- Satellite reuse facilities (membrane bio-reactors) at locations remote from wastewater treatment plants
- Tail water recovery

Interconnects need to be encouraged in order for the region to take advantage of varying hydrologic conditions and optimize all water supplies.

The discussion and debate around alternative water sources focused on how to first prolong the need for implementing them while at the same time studying how and when they should be added to the current water supply options. Among the recommendations:

- **Use best-available science, modeling, empirical data and professional judgment to quantify and forecast the availability of water resources.**

  Without a detailed picture of where the region stands at any given time in water use, it will be impossible to persuade stakeholders to spend the time, effort and money on new sources.

- **Coordinate efforts to fill in data gaps in the information currently available about water use throughout the region.**

- **Require congruent planning between utilities, local governments and water management districts to ensure consistency in long-range planning between land use and water use.**

- **Require utilities, local governments and water management districts to adopt policies to allow for recommendations made through this process.**

- **Use adaptive management practices to respond to changing conditions and proven scientific advancements.**

  Apply adaptive management on two levels: 1) Water supply and 2) Utility and agricultural consumptive use permitting level.

- **Use an inclusive regional approach to conservation and alternative water supply.**

  The key to this recommendation is to keep a regional focus.

- **Water management districts must coordinate to adopt consistent policies and guidelines for the region.**

  There was overwhelming consensus among committee members that this should be done.

- **Better manage water supply by working on a regional basis to address water system interconnections and collaborations.**

## Next Steps

One thing that became clear during the Phase I collaboration is that water inspires passionate debate. When it comes to conserving water, using water, and searching for new water, everyone has an opinion. This is both a good thing and a bad thing. It will come in handy when the region begins to educate the public on its shared vision for the future of water in Central Florida. But it is likely to create some intense discussion, especially in the area of ownership. Who owns which water source? Who owns what part of the process to get the water to the consumer? Who owns enforcement of the rules that govern water and its use? These are questions that will be addressed in Phase II: Creating a Civic Architecture.

The goal of Phase II is to address these issues in a cohesive way, with the shared vision of Phase I in mind, and with ground rules in place to guide the debate.

**Phase II: Creating a Civic Architecture**
**(December 2010 – June 2011)**

- **Define the "problem."** (January)
- **Host regional stakeholder meetings** (February/March)
- **Prepare briefing book** (March)
- **Host "best practices" workshop** (April)
- **Prepare white paper** (May)
- **Advance white paper to CRL** (June)

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# Appendix I — Regional Water Stakeholder Meetings

Between September 2009 and January 2010, a series of County stakeholder meetings were conducted in each of the seven Counties to discuss areas of consensus as well as locational differences in creating a regional water strategy.Meetings were organized by County representatives who either served on the Regional Water Steering Committee and/or by representatives of the Congress of Regional Leaders.Attendees were selected by their County organizers to represent a cross-section of stakeholders involved in water issues including representatives from local utilities, public officials, civic leaders, environmental community, land owners, engineers, hydrologists, Water Management Districts and FDEP.

Each meeting consisted of an introduction to the Project followed by a working exercise.The working exercise involved breaking-out attendees into groups to address the following:

***Consider this:***
It's the year 2050 and Central Florida is recognized as international leaders managing its regional water supply in an environmentally and economically sustainable way.

**Question 1.** What did the region do to provide for an environmentally and economically sustainable supply of groundwater?

**Question 2.** What did the region do to provide for an environmentally and sustainable supply of surface water?

**Question 3**. What did the region do to provide for an environmentally and economically sustainable supply of reuse water to reduce overall demand?

**Question 4.** What did the region do to reduce demand for water in an environmentally and economically sustainable manner?

## Key Themes and Issues

For complete notes from each County Stakeholder meeting, please refer to Appenix D.

### Brevard County Meeting – Sept 28, 2009

- Consensus needed on science and groundwater assumptions that underline problem statement
- Consensus needed on withdrawal limits
- Equitable development, cost, and distribution of water across region
- Development of desalination.

### Lake County Meeting – November 4, 2009

- Limit the issuance of Consumptive Use Permits by WMD's, WMD refocus on conservation first and permit for beneficial use.
- WMD's uncertainty on water modeling
- Education Barriers– Understandable water bills, conservation pricing, reuse value
- Understand surface water sustainability (minimum lake levels and flows)

- Stormwater use for irrigation
- Reuse Storage
- Existing home retrofits
- Cost Barriers to AWS, cost sharing, cost of retrofits
- Appropriate focus on industrial, commercial other and big users.

### Osceola County Meeting – November 5, 2009

- Wells for drinking water only, monitoring of wells, well use regulation
- AWS Storage Network – Surface water, reuse water
- Need model of available water for environment and consumption
- Public Education
- Direct reuse water to biggest users for best efficiency.
- Establish reuse water goals
- Conservation measures, incentives and education.Regionally consistent governance.
- Stormwater rules vs. water supply constraints

### Orange County Meeting – November 10, 2009

- Incentivized technology at homeowner and infrastructure level that put in place technology for capturing and saving water.
- Establish equitable demand "allowances" for each user. Create "cap and trade" method that allows for allocation and trade of water credits. Communities could then either sell or buy credits depending on how they manage their own water.
- Advanced use of stormwater as an alternative source.
- Need for incentives for encouraging reduced use (tax credits)
- Also need to have pricing incentives.

### Polk County Meeting – December 8, 2009

- Focus and develop surface water and groundwater storage strategies.
- Need to take regional approach by including coastal communities, including Tampa area.
- Land Use Transition - Agriculture demands are unique in Polk County and may not decrease at same rate as in the region.
- Development of the Polk County Comprehensive Water Supply Plan is a great model for developing a water strategy as it has brought local staff and the water management districts together with stakeholders and residents.

### Seminole County Meeting – January 25, 2010

- Avoid lawsuits (and costs) by having common understanding and Agreements between stakeholders
- Focus on conservation through reduction in irrigation and improvement in landscape design

- Private wells need better regulation
- Protect recharge areas
- Quantify excess surface water availability as top priority
- Think regionally

### Volusia County Meeting – October 22, 2009

- Purchase of environmentally sensitive recharge areas.Purchase watersheds to replenish our ground water.
- Collection of rainwater, storm water runoff, river water high flow, etc. to reservoirs and cisterns
- Submeter & charge individual wells
- Tiered rate structure (more you use the more you pay)
- Created Regional storage and distribution networks to collect all available resources. Network also was created on local and micro-scale to reduce infrastructure and transportation costs.
- Expand reuse lines to the entire region and make it mandatory.
- All cities and counties enacted green building ordinances that require water wise/low use plumbing fixtures.

Upon completion of the county stakeholder meetings, results were then tabulated into a matrix to compare responses based on frequency grouped within common categories (refer to Exhibit 2-1).

## Exhibit 2-1: County Stakeholder Issues Matrix (1 of 4)

| | Brevard | Lake | Orange | Osceola | Polk | Seminole | Volusia |
|---|---|---|---|---|---|---|---|
| **Conservation and the Environment** | | | | | | | |
| Environmental/climate changes might make current water sources undependable in future | ♦ | ♦ | | | | | |
| Protect & remediate surface and aquifer water quality/higher standards for recharge areas | ♦ | ♦ | | ♦ | | ♦ | ♦ |
| Create a regional water conservation plan, including enforcement | | ♦ | | ♦ | | | |
| Purchase/protect environmentally sensitive areas (wetlands, recharge areas, habitat, etc.) | | ♦ | | ♦ | | ♦ | ♦ |
| Control run-off/contamination (including septic leakage) | | ♦ | ♦ | | | ♦ | |
| Central Florida is at the "headwaters"; need to consider downstream impacts | | | | ♦ | ♦ | ♦ | |
| Improve agricultural practices | | ♦ | | | | | |
| Consider wildlife needs in water plans | | | | ♦ | | | |
| Use natural systems/topography for recharge areas in lieu of man-made structures | | | | | | | ♦ |
| **Economics and Pricing** | | | | | | | |
| Equitable cost & price for water across the region | ♦ | ♦ | | ♦ | ♦ | ♦ | ♦ |
| Water is currently very inexpensive/raise potable rates | ♦ | ♦ | ♦ | ♦ | | ♦ | |
| How to balance expensive desalination water on the coast w/inexpensive groundwater inland | ♦ | | | | ♦ | | |
| Change reuse water rate structure to "true" value | ♦ | ♦ | | | | | ♦ |
| Create tiered pricing for all water sources (potable & reuse) to reduce demand & pay for retrofits | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Make tiered rates universal in region | ♦ | ♦ | | | | | ♦ |
| How to balance financial resources of smaller & larger communities | ♦ | | | | ♦ | | |
| High cost & limited availability of capital for new infrastructure & retrofit | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Factor in cost of operation & maintenance (labor, materials & energy) | | | | ♦ | | | |
| Meter/charge for private well water | | ♦ | | | | ♦ | ♦ |
| Financial incentives for building & landscape retrofits | | ♦ | ♦ | ♦ | | ♦ | ♦ |
| Account for the high cost of pumping "bulky" utility | | ♦ | | | | | ♦ |
| Eliminate bottled water sales tax exemption (tax at or above other beverage rates) | | | ♦ | | | | |
| Implement a "cap and trade" system to allocate water resources | | | ♦ | | | | |
| Provide incentives for large land owners to preserve open space/agriculture (TDR) | | | | ♦ | | | |
| Provide opportunities for public/private partnerships in new infrastructure | | | | | | | ♦ |
| Reward communities who lead in water conservation | | | | ♦ | | | |
| Lawsuits are already consuming too much money | | | | | | ♦ | |
| **Design and Development** | | | | | | | |
| ***Development and Land Use*** | | | | | | | |
| Move to compact development; reduce setbacks | ♦ | | | ♦ | ♦ | ♦ | |
| Slow/control growth | | ♦ | | | | | |
| Sustainable growth requirement in comprehensive plans | | ♦ | | | | | |
| Change HOA rules that are contrary to water conservation | | | ♦ | ♦ | | | |

## Exhibit 2-1: County Stakeholder Issues Matrix (2 of 4)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Agriculture is an essential regional need & must have high priority in planning | | | | | ♦ | | |
| ***Building, Landscape and Site Standards*** | | | | | | | |
| Shift to low flow/efficient/"smart" fixtures & appliance standards | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Encourage building capture & reuse techniques (rain barrels, gray water reuse, etc.) | | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Require new buildings to be plumbed for reuse | | | | | | | ♦ |
| Shift to Florida-friendly landscape plants; landscape not dependent on supplemental irrigation | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Reduce use of manicured lawns (both type & quantity of grass) | ♦ | ♦ | ♦ | | ♦ | ♦ | ♦ |
| Implement best practice irrigation design (drip irrigation, soil moisture sensors, etc.) | | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Sensors to let water managers know when irrigation running on no-water days | | | ♦ | | | | |
| Annual inspection/certification of irrigation systems | | | | | ♦ | | |
| Implement retrofit program to meet stricter building & landscaping standards | ♦ | ♦ | | | ♦ | ♦ | ♦ |
| Increase opportunities for recharge/pervious surfaces in urbanized areas | ♦ | | | | | ♦ | ♦ |
| Require Low Impact Development (LID) standards | | | | | | | ♦ |
| ***Infrastructure*** | | | | | | | |
| Maintain infrastructure to reduce loss/leakage | ♦ | | | | | | |
| Expand/require reuse infrastructure in new development | ♦ | | | ♦ | | ♦ | ♦ |
| Retrofit infrastructure in existing communities to use more reuse | | ♦ | | ♦ | ♦ | ♦ | ♦ |
| Ensure efficient use of water infrastructure investment (reclaim pipes being underutilized) | ♦ | | | | | | |
| Install central sewer infrastructure to replace septic (increasing supply of reuse water) | | | ♦ | | ♦ | ♦ | |
| Reduce overall water use (especially potable) in power plant generation | | ♦ | | | ♦ | | |
| Provide better coordination between water retrofits and road construction | | | | ♦ | | | |
| **Education and Outreach** | | | | | | | |
| Educate on right type of water for right use (potable for drinking, non-potable for everything else) | ♦ | | | ♦ | | ♦ | ♦ |
| Build consensus by all parties that this is a regional problem; quantify the issues | ♦ | | | ♦ | ♦ | ♦ | ♦ |
| Educate why water rates are currently too low | ♦ | | ♦ | | | | ♦ |
| Educate why business as usual is not sustainable/crisis upon us | ♦ | ♦ | | | | ♦ | ♦ |
| "Yuck" factor to reuse drinking water | ♦ | | | | | | |
| Make water consumption on bills more understandable; how do you compare to neighbors? | | ♦ | ♦ | | | | |
| Improve credibility of regulators with public | | ♦ | | | | | ♦ |
| Educate kids, property owners, builders/developers, HOAs, municipalities, elected officials, etc. | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Change social attitudes/public and policy maker buy-in | | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Better promotion of new programs as they become available (such as rebates) | | | ♦ | | | | |
| Publish names of top water users in local media | | | ♦ | | | | |
| Educate on myths vs. facts between bottled water & tap water | | | ♦ | | | | |
| Educate that there is plenty of water if used the right way | | | ♦ | | | | |

## Exhibit 2-1: County Stakeholder Issues Matrix (3 of 4)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Conduct water user surveys to understand perceptions/behaviors | | | ♦ | | | | |
| Provide point-of-sale info about proper disposal of toxins/liquids (such as motor oil) | | | | ♦ | | | |
| Provide cost, benefit & payback info on conservation techniques to builders/developers | | | | ♦ | ♦ | | |
| Educate why what's good for the environment is also good for the economy | | | | ♦ | ♦ | | |
| Follow up this project with extensive community outreach | | | | | ♦ | | |
| Use comparisons from other regions that are leaders in conservation | | | | | | ♦ | |
| **Groundwater** | | | | | | | |
| Use right quality water for appropriate uses (groundwater for potable only for example) | ♦ | ♦ | ♦ | ♦ | | ♦ | ♦ |
| Limit issuance of Consumptive Use Permits | | ♦ | | | | | ♦ |
| Protect and encourage groundwater recharge | | ♦ | | ♦ | | ♦ | ♦ |
| Consider use of lower Floridan aquifer | | ♦ | | | | | |
| Eliminate new private wells within cities | | ♦ | | | | | ♦ |
| Better understanding on sustainable groundwater supply vs. environmental impacts | | | ♦ | | | | ♦ |
| Convert retiring agriculture wells to domestic wells | | | | | ♦ | | |
| Locate wells to have the least impact on environment | | | | | | ♦ | |
| **Alternative Water Sources** | | | | | | | |
| ***Surface Water*** | | | | | | | |
| Minimize surface water diversion to tide/utilize "excess" | ♦ | ♦ | | ♦ | ♦ | | ♦ |
| Agree on and enforce environmentally-sustainable minimum flows & water levels | ♦ | ♦ | ♦ | | | ♦ | ♦ |
| Develop a surface water withdrawal & storage plan/network | | | | ♦ | ♦ | ♦ | ♦ |
| Need to consider downstream user needs in river withdrawals | | | | ♦ | ♦ | | |
| Amount of water available for storage can vary greatly within the region | | | | | ♦ | | ♦ |
| ***Desalination*** | | | | | | | |
| Consider brackish sources for desalination | ♦ | | | | | | |
| Desalination is an important alternative source of water for the coast | ♦ | | | | ♦ | | |
| Improve desalination technology to reduce capital & energy costs | | | | | | ♦ | |
| ***Aquifer Storage and Recovery (ASR)*** | | | | | | | |
| Use treated wastewater and stormwater for ASR | ♦ | | ♦ | | | | |
| Potential of arsenic could limit ASR | | | | | ♦ | | |
| Injected water in ASR needs to be of good quality | | | | | ♦ | | |
| ***Reuse*** | | | | | | | |
| Capture, treat and reuse regional stormwater | ♦ | ♦ | ♦ | ♦ | | ♦ | ♦ |
| Capture, treat and reuse regional wastewater; wastewater being "lost" to tide | ♦ | ♦ | | ♦ | ♦ | | ♦ |
| Advanced treatment of reuse water for drinking water | ♦ | | | ♦ | ♦ | | |
| Store reuse water in ASR, lined reservoirs, storage tanks during wet weather and off-peak | | ♦ | | ♦ | ♦ | ♦ | ♦ |
| Distribute water from the Crystal River power plant | | ♦ | | | | | |
| Establish goals/change codes/make reuse mandatory for non-potable uses | | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Reuse water availability drops as overall water use drops | | | | ♦ | | | |
| Nutrient levels in reuse water seen as challenging | | | | | | ♦ | |
| Treat reuse water like all other forms of water: as a valuable resource | | | | | | | ♦ |

## Exhibit 2-1: County Stakeholder Issues Matrix (4 of 4)

| Regulation, Governance and Policy | | | | | | | |
|---|---|---|---|---|---|---|---|
| Who owns the water? | ♦ | | | | | ♦ | ♦ |
| Equitable availability of water across the region; what's best for region | ♦ | | | | ♦ | ♦ | ♦ |
| Consensus on the science/facts; improved regional data collection | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| Consensus on what is environmentally sustainable | ♦ | ♦ | ♦ | | | ♦ | ♦ |
| Need to begin planning now | ♦ | | | | | | |
| Consistent modeling between WMDs/utilities | ♦ | ♦ | | | ♦ | | ♦ |
| Consistent and effective rules, rates, incentives, management & enforcement across region | ♦ | ♦ | | ♦ | ♦ | ♦ | ♦ |
| Universal implementation of the Regional Growth Vision | ♦ | | | | | | |
| Prioritize water usage (who gets what first & from where) | | ♦ | | | | ♦ | |
| Recognize the unique needs of communities/environments within a regional approach | ♦ | | ♦ | | | | ♦ |
| Create a strategy/policies to reduce per capita water consumption; numeric targets | | ♦ | | | | | ♦ |
| Water rationing/maximum monthly allocation (as in Australia) | | ♦ | ♦ | | | | |
| Regulate existing private wells | | ♦ | | ♦ | | ♦ | ♦ |
| Better modeling to include DSS Portion | | ♦ | | | | | |
| Politics of water/elected official buy-in/will power | | ♦ | | ♦ | ♦ | ♦ | ♦ |
| Shift WMD/utilities priorities from issuing permits to conservation; water profit defeats conservation | | ♦ | | | ♦ | ♦ | ♦ |
| Intergovernmental cooperation instead of competition | | ♦ | | | ♦ | ♦ | ♦ |
| Respect private property rights | | ♦ | | | | ♦ | ♦ |
| Ensure policies allow for water to be shared between producers | | ♦ | | | ♦ | | |
| Regulations (example TMDLs)/WMDs/"big government" seen as barrier; unintended consequences | | ♦ | ♦ | ♦ | | ♦ | |
| Stricter regulation on bottled water industry; require bottled water produce quality reports similar to utilities | | ♦ | ♦ | | ♦ | | |
| Stop issuing permits for septic systems/reduce existing ones | | ♦ | ♦ | | | | |
| Make sure that people/communities not penalized for conserving | | | ♦ | | | | |
| Political boundaries don't follow water boundaries | | | | ♦ | ♦ | | |
| Decisions based on bottom-up approach, not top-down | | | | | ♦ | | |
| Understand the relationship between water demand & energy (cooling towers, biofuels, desal, etc.) | | | | ♦ | ♦ | ♦ | |
| Watering day restrictions not effective unless enforced (enforcement creates conflict w/customer) | | | | | ♦ | ♦ | ♦ |
| Remove regulatory barriers/establish standards for use of non-potable water, cisterns, etc. | | | | | | ♦ | |
| Any new regulations must have "teeth" & funding to be effective | | | | | | | ♦ |
| Better coordination of state water, building & landscape legislation (SB 494, SB 2080, etc.) | | | | ♦ | | ♦ | ♦ |

♦ Indicates that the issue was mentioned at least once during County Stakeholder meeting.

# Appendix II — Panel examples

## *Example 1: www.occonservewater.net*

The new Orange County Utilities water conservation website, an FSAWWA 2010 Water Conservation award winner, is designed to provide a one-stop location for customers and other conservation-minded individuals to gather information about how they can participate in water conservation efforts.

By connecting to www.occonservewater.net, Orange County customers find information about incentive programs, classes and workshops, indoor water savings devices, and landscape watering guidelines. Teachers and educators are able to use the website to register for school programs and to download hands-on activities. Businesses and homeowners may request an evaluation of their irrigation system. Customers will also find a number of water-saving tips, a water use calculator to help identify potential areas for water-savings in their home, and information about how to read their utility bill.

On the "Ways to Save" page of the website is a detailed sample bill that explains each section of the bill and includes a 12-month water-use history. This helps customers track their usage and take note of any significant changes that occur during specific months of the year. Another feature under "Ways to Save" is an interactive tool that helps residential customers know what day(s) they are allowed to irrigate their lawns. The customer simply enters the digits of his home address and clicks submit. A message pops up to tell him what day(s) are allowed for his address.

*Source: Orange County Utilities*

## *Example 2: Gainesville Green*

**Mission**
Our mission is to reduce greenhouse gas emissions and preserve drinking water supplies by improving energy and water efficiency in buildings. We believe that providing information empowers people, setting goals establishes direction, and comparing performance provides feedback to live and learn from our successes as we leave our footprints on the path toward a cleaner climate, a healthier society, and a more prosperous economy.

**Overview**
*Gainesville-green.com* is a hosted application for displaying resource consumption and increasing consumer environmental awareness.

**How it works**
Location and consumption data is imported from several sources and combined to create an intuitive map of usage, including an easy ranking system allowing homeowners to compare and compete.

**Goals**
- Provide consumers with tools to help reduce usage
- Provide tools to help utilities analyze consumption

Source: *gainesville-green.com*

## *Example 3: Conserve Florida*

**Mission**
The mission of the Conserve Florida Water Clearinghouse is to develop collaborative relationships with related programs, and to collect, analyze, and make available reliable information and technical assistance to public water supply utilities and water managers for use in developing effective and efficient water conservation programs.

**Goals**
- Be the premier source in Florida of water conservation information for public water supply, drawing upon information and expertise from throughout the utility sector, the water management districts, the state university system, and other sources.
- Help Florida become a national leader in water use efficiency.
- Focus directly on Florida's needs and users, but take advantage of opportunities to build on expertise and resources outside of Florida.
- Serve public water supply utilities, water management districts, and other stakeholders in improving water use efficiency.

**Objectives**
1. Host and refine an interactive, web-based, water conservation guide to assist public water supply utilities in developing goal-based water conservation plans which are tailored to their specific service areas and meet permitting requirements.
2. Host and develop an integrated statewide database with infrastructure for the collection, evaluation, and dissemination of quantitative and qualitative information on public water supply conservation programs and practices and their effectiveness.
3. Host and develop a searchable web-accessible library of historic and current water conservation studies and reports.
4. Provide a mechanism for benchmarking water conservation practices among utilities to determine and compare their effectiveness.
5. Provide a means for water conservation professionals to obtain technical assistance for understanding, developing, and implementing effective and efficient water conservation projects or programs that will meet water management district regulatory requirements.
6. Make available analytical tools to allow the evaluation of water conservation programs and practices as an aid to selecting the best management practices. Incorporate these tools into the Guide.
7. Coordinate and maintain oversight of an applied research agenda to help develop innovative water conservation programs and practices.
8. Evaluate and enhance the water conservation Guide to improve results.
9. Publicize the importance of water conservation and the availability of Clearinghouse services to the water utility community.
10. Establish and grow collaborative relationships with related programs to enhance the effectiveness of the Clearinghouse to achieve its goals and objectives.

Source: *www.conservefloridawater.org*

## *Example 4: Florida-Friendly Landscaping™*

The Florida-Friendly Landscaping™ Program is an initiative of the University of Florida and the Florida Department of Environmental Protection to conserve water, control pests, and reduce the proliferation of invasive non-native plant species by following nine specific landscaping principles:

1. **Think right plant, right place** – Select plants that match a site's soil, light, water, and climatic conditions.
2. **Water efficiently** – Water early in the morning; follow water restrictions; and don't water if it's going to rain.
3. **Fertilize appropriately** – Look for fertilizers with slow-release nitrogen and little or no phosphorous; never fertilize within 10 feet of any water body; and don't fertilize before a heavy rain.
4. **Mulch** – Using mulch helps retain soil moisture, protects plants, and inhibits weed growth.
5. **Attract wildlife** – Birds, bats, bees, and butterflies are pretty. They eat pests and pollinate your flowers.
6. **Manage yard pests responsibly** – Select pest-resistant plants to minimize the need for pesticides.
7. **Recycle yard waste** – Decomposed organic matter, like pruned branches or grass clippings, releases nutrients back to the soil in a form that plants can easily use.
8. **Reduce stormwater runoff** – Creating shallow rain gardens, or shaping the earth on slopes with berms (rises) and swales (dips), can help slow runoff from heavy rains and allow the water time to soak into the ground.
9. **Protect the waterfront** – Do not mow, fertilize, or use pesticides within 10 feet of a river, lake, or stream. Don't let any grass clippings or pet wastes get into the water, as these carry elements such as harmful bacteria.

*Source: www.floridayards.org*

## *Example 5: Florida Water Star℠*

Florida Water Star℠ is a voluntary, third-party certification program designed to increase water efficiency in landscapes, irrigation systems and indoor uses. While many certification programs provide general guidelines for water efficiency, Florida Water Star℠ specifically addresses uses relevant to Florida.

The program consists of criteria for three types of construction/development:

- Residential
  First house certified in July 2006, with approximately 50 houses certified through 2008.
- Commercial
  Currently being pilot-tested on multiple commercial uses.
- Community
  Criteria are currently under development and being pilot-tested.

Florida Water Star℠ can be effectively integrated into projects along with other programs such as ENERGY STAR®, the Florida Green Building Coalition's (FGBC) green standards, and the U.S. Green Building Council's (USGBC) LEED program. When compared to many other green building certifications, Florida Water Star℠ is noticeably more detailed and relevant to Florida's unique conditions, and can therefore further enhance the effectiveness of other green certification programs.