How Should Florida’s Water Supply be Managed in Response to Growth?

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The Askew Institute offers its appreciation to the following organizations for their support of the annual meeting:

The Florida Humanities Council
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For those of you who would like additional information about the Askew Institute you should contact:

Dr. David Calburn, P.O. Box 117320, Gainesville, Florida 32621-7320 or call 352-846-1998.

Information about the 2005 meeting can also be obtained at its website: www.mcb.ufl.edu/askew

TURBULENT TIMES IN WATER SUPPLY, WATER MANAGEMENT AND ENVIRONMENTAL REGULATION

Water is the single most important issue facing Florida today because water is life. Without an adequate supply of water our state will not be able to continue to grow and flourish.

I think we learned more about the specifics of water management in the last few days than any of us have before. We understand from Paul Reiter that this is not just a Florida issue; it is a global issue that faces every nation in the world. We learned from Len Shabman, Christine Klein and others that states have approached the problem differently with more or less success. We must learn from these experiences and do what is best for Florida.

We need people who are willing to look down the road. The 1972 Environmental Land and Water Management Act brought diverse groups together to develop the first water and land planning in Florida and created our regional approach to water which has been quite successful. Our laws now need to be updated to take advantage of new information, new technologies and the conservation of our water supply.

The year’s Askew Institute will make more specific recommendations than we have done in the past and that is good. Edward Everett Hale, chaplain of the US Senate, once said, “I am only one; but still I am one. I cannot do everything, but still I can do something; I will not refuse to do something I can do.” That is an important lesson for each and every one of us. If each one of us does one thing to conserve or use water more wisely that will be an excellent start, and I hope our recommendations will reflect that.

Florida Water Day is April 26. We should use this as a time to bring groups together to talk about our water crisis and to inform the public. It is time to stop discussing whether or not Florida has a water crisis; I think it is a continuing crisis that must be addressed now if we are to have the water we need in the future. There is no greater challenge facing Florida.

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How Should Water Be Managed In Response To Growth: An International Perspective

By Paul Reiter, Executive Director, International Water Association, United Kingdom

Water is life. Loren Eiseley said in The Immense Journey, “If there is magic on this planet, it is the water that flows through our planet, this is our home. And it’s home we can’t reproduce, we have to understand, and we have to live in. For many reasons, that observation can lead to pessimism. For me it is reason for optimism, but only if we deal with the world we are facing. The world’s population is now 6 billion people and we’re already running up against serious water issues because water resources are fixed and finite. We live off a little less than 1 percent of the water on the planet. A number of the readily available resources have already been used. So we either learn to use that small percentage better or we learn to tap into the need to locate water which is essentially salt water or a combination of salt and fresh water.

That challenge plays out in three ways: (1) coping with growing water demands; (2) addressing widespread water pollution (seen and unseen); and (3) closing the gap on access to water in the population. Most water is tied up in agriculture. We’re feeding ourselves as the global population grows through a more inefficient use of water but a more efficient production of food through irrigation. In the first half of the last century, irrigated land doubled and from 1950-1980, it doubled again. Since 1980, irrigation usage has increased at a slower rate. Basically, we have a significant amount of water going to agriculture. And in some sense this is a misfortune. We now have to produce a lot of food by irrigating land and by building the conveyance mechanisms needed to do that. This is good news from an agricultural point of view but from a water resource, supply, and availability point of view, it’s a dismal picture.

Let’s take a walk over 75 years, by 2050, 20 year increments. We can see as the population grows, we use more water resources. By 2025, there will be a significant population on the planet in water scarce circumstances. This is no mystery. There is a fixed supply of water and a growing population. In the next 20 years, a majority of the 2 billion people added to this planet will be in dry areas. We really have to be raised. If we put those two imperatives together, we are currently in the midst of a pretty big paradigm shift. In the old paradigm, water management is divided strictly between agriculture, urban, and industrial uses; water is used only once; we use water very inefficiently and pollute water because it’s abundant and a great way of transmitting things that we want to get rid of and use water or agricultural waste. Moreover, in the old paradigm, we treat the environment as an unequal partner. We think of the environment as a constraint as opposed to treating the environment on an equal footing with water and people for water and industry.

The new paradigm is that coming about in fits and starts in parts of the world is one of integrated water planning and management. It involves using water efficiently first the time and then reusing it multiple times, minimizing pollution at the source, maximizing the environment as an equal partner.

So how might we think about this differently? An example is the forest product industry. In 1900 a tree would go through a saw mill, 40 percent of the resource was used and the remaining 60 percent was waste. By the turn of this century, almost all of it is used. In 1950, about 10 percent of fiber was recycled globally. By 2000 it was up to 45 percent. And what’s happening is that the increased demand for paper is largely met by increased recycling. Ask yourself this question: What would you think would be the comparable statistic with water? I bet you that there is very little aggregate change in how we have used water over the last 50 years. We need to become more efficient. And we need to think differently about water quality and managing lower quality water to certain uses such as irrigation, in much the same manner that fiber is reused for toilet paper and packaging material.

We need to think differently and be innovative so as to meet emergent and traditional challenges and operate in a truly sustainable manner. The dimensions of innovation include: the management and policy framework, planning and regulation, technical components, and social and education components. Perhaps the best example of a management framework that could be applied to the U.S. is France. In 1408, France created six basin agencies. Each basin agency has a taxing authority with revenues collected on the pollution side and revenues collected on the water supply side. These agencies collectively deal with 20,000 municipalities. The interest of those municipalities get brokered through the basin agencies entirely by consensus — quality management standards, water treatment facility needs, drinking water plant needs, and distribution system needs. In the process these agencies make locally-based investment decisions. An example of water management on a broader scale is the European Union. The European Union established the EU Water Framework Directive with the goal of achieving the highest quality status for all water in the EU by 2015. Turning to Australia, we have another example of a new paradigm. The Murray-Darling basin is where most of the water resources in that continent are found. The situation with the Murray-Darling is similar to Southern California. Irrigation doubled from 1900-1950 and then doubled again from 1950-1980. The Murray-Darling was moving to being a completely dry river at the mouth. A cap was originally put on withdrawals of the basin at 11,000 gigaliters per year. A commission was created and an effort is being made to reduce withdrawals to 8,000 gigaliters per year. You could see that would be a substantial decrease in withdrawals from this basin. And if you add that to climate change, you can see that Austalrians are busy rethinking how they’re using water. What are they doing? They are working on rolling back regulations on water uses, buying back water rights because of inefficient water use in agriculture, introducing market mechanisms for agricultural water use and pricing, establishing water trading schemes between urban and agricultural users and applying conservation and how we use water, the continued on page 30
Florida’s Water Story Distilled: Cutting Through The Rhetoric About Water Supply In Florida

By Cynthia Barnett, Associate Editor, Florida Trend Magazine

I chose the theme of "distilling Florida’s water story" because separating what’s real from what’s rhetoric is one of the trickiest aspects in the public debate over water supply – actually in any public debate today. It will come as no surprise to you that the field of journalism is in a crisis of identity and credibility. Part of our crisis is self-inflicted, of course. But part of it has to do with the incredible amount of information available to the public on any issue – and the speed at which it is available. When I began my career just 20 years ago, journalists were still what Walter Lippmann termed “gatekeepers,” the go-between between the public and the government and other sources. Today, with the Internet and the bloggers and the incredible growth and power of the public relations industry, there are huge amounts of information everywhere for everyone to hear.

So the journalist’s role as gatekeeper is over. On the issue of water, you can go online and read the water management district’s water plans, the text of every water bill pending in the Legislature, and the SEC documents of every publicly-traded water company. My role, and that of my journalist peers, is evolving into what the media analyst Tom Rosenstiel calls “authenticator.” That is, we are watching and reading the reports and the blogs and the press releases and the government-paid-for infomercials along with you. And then it’s our job to dig further to try and help our readers and viewers distill truths – to authenticate information if you will.

I’ve come up with five pieces of “conventional wisdom” about water supply in Florida. Some I hope to debunk, others to simply distill. And one or two I hope we can debate as the day progresses.

Conventional Wisdom No. 1 — “Florida is different.” Many people are convinced that Florida’s problems are completely different from those of the western states, and from those of other parts of the globe afflicted with water shortages. Why? There is plenty of water in some parts of Florida. The problem isn’t so much that water is in short supply. It’s that the water is not where the people are. Florida’s water supplies are recharged by rainfall. But while the state gets a high 55 or so inches of rain a year, most of that rain falls to the north of where we are now. Eighty percent of the population lives south of the so-called hydrologic divide, but only 44 percent of rain falls south of it. I would argue that this is no different from the issue of water distribution at every single level of our society: globally, continentally and nationally. So in my distilled version: Florida is not so different.

Conventional Wisdom No. 2 — “Florida has the highest consumption of water in the world.” This is something that people outside Florida, including water-policy experts, seem to believe about Florida. I first heard this statement in a water-policy class at the University of Michigan. This statement is also made outright by University of Arizona Professor Robert Jerome Glennon, a well-respected law-water expert, in his book Water Follies: Groundwater Pumping and the Fate of America’s Fresh Waters. I thought you’d find it interesting that two of the most popular books about water supply in recent years devote entire chapters to Florida. Nationally, the issue is definitely not seen as a western one any more. Robert Glennon’s book has a chapter on the Tampa Bay Water Wars and Diane Raines Ward’s Water Wars: Drought, Floods, Folly and the Politics of Water has a chapter on the Everglades. Back to the conventional wisdom, no matter how you calculate per-capa consumption in the United States, California comes out on top. Florida’s ranking moves around depending on how you calculate consumption. In 2000, Florida’s total freshwater withdrawals were 8.2 billion gallons a day. The measure of water consumption considered by the U.S. Geological Survey to be the most accurate is to divide total watershed withdrawals for public supply by population. That measure doesn’t include agriculture, power and other industrial withdrawals. Per capita use in Florida was 174 gallons per day in 2000, based on the USGS measurement — slightly below the national per capita average for 2000 of 180 gallons a day. The bad news is that per-capita use has been declining in the United States since 1980 due to water conservation, per-capita water use in Florida increased slightly for the 2000 cycle because the drought that year greatly increased irrigation. So my distilled version is this: Florida doesn’t have the highest consumption of water in the world. But it’s getting close.

Conventional Wisdom No. 3 — “Floridians in 2005 face a statewide water crisis at present.” Many just don’t realize it.

Cynthia Barnett

"Floridians in 2005 face a statewide water crisis at present. Many just don’t realize it."

Conventional Wisdom No. 4 — “Privatization of water is not an issue in Florida.” In fact, the North American market is considered by private water companies to be the “original jewel” of the global water market, partly because water use is so high here. Let’s consider the pros and cons of private water. On the global scene, a major criticism of private companies is that they’ve come up with huge promises and then reneged on them later after landing a contract. In the case of Atlanta, citizens felt that United Water was less accountable and less responsive than the city government. And that’s a far cry because citizen dissatisfaction was the reason for the privatization in the first place. In the older case of Daval, Nassau and St. Johns counties and United Water, rate increases led to a buyout by the Jacksonville Electric Authority which has now reduced rates by some 25%. As for the advantages, U.S. water systems will require investments of $250 billion over the next 30 years. Moreover, according findings from a new AEI Brookings Institution report, customers do not appear to pay more, on average, for water and private-owned systems comply with health/safety regulations about as well as government-owned systems. So my distilled version is that water privatization is a key issue in the United States, including Florida.

Conventional Wisdom No. 5 — “Floridians in 2005 do not face a statewide water crisis at present.” Charlotte County gets water from DeSoto County. Sarasota County gets water from wells in Manatee County. In coastal Walton, Okaloosa and Santa Rosa counties in the Panhandle, water levels have dropped as much as 10 feet below sea level. Near Orlando, groundwater levels have dropped 25 feet in places. On the east coast, Titusville has notified the St. Johns River Water Management District that it will run out of water five years from now, in 2010. So the psychology of a crisis, of course, is that it’s a crisis when it’s happening to you. For example, Arnold and Beverly Larsen of Spring Hill, faced with a large sink hole in their yard, probably think we have a crisis on our hands. For the rest of us, it may require another drought. But consider just how many Floridians are dealing with crises right now.

To conclude, I think it’s worth remembering the media at mid-1972, when Governor Askew brought together stakeholders from throughout Florida, when he declared a crisis and oversaw passage of the strongest water laws in the nation, the state had undergone a really severe drought. Hundreds of acres of the Everglades were on fire, leaving a thick black smoke hanging over most of southern Florida. I would be interested to hear from Governor Askew whether he thinks water reform is possible without such a drama. My own distilled version is this: Floridians in 2005 face a statewide water crisis at present. Many just don’t realize it.
Complexity, Confusion, and Complacency
In Water Supply Management
By Dr. Sanford Berg, The University of Florida

There are at least two views of history that, in my opinion, Arturo says that we perceive reality. They also guide our policy prescriptions. Let’s consider these views in the context of water. First is the conspiracy theory. According to that theory, particular groups are deliberately manipulating public attitudes to gain private advantage. The groups are very powerful and difficult to pin down. In fact, the inability to obtain tangible evidence regarding the conspiracy is “evidence” of the conspiracy’s effectiveness. Crisis is often the result of such forces. We hear charges by environmentalists that business interests are blocking or stalling their initiatives and countercides from businesses along the same lines. So I think the conspiracy theory is alive and well.

Second is the confusion theory. According to that theory, technological, economic, political and social forces are very complicated; and now and then, like water, gets tossed up onto our radar screens. Because such issues are very complex, we have trouble understanding the nature and scope of the problems. If we delay, crisis often ensues.

Let’s examine how different fields of study might approach these two views of history. I think the world is very complicated. I believe that special interests articulate their views and are able to influence law and their implementation. People working with water issues fall into a number of categories and I think these categories shape the way they see things. They talk about “seeing is believing.” It’s also true that “believing is seeing.” Our training in effect puts blinders on us. And that’s fine, because it allows us to delve into subjects in a consistent manner, but it also means that we’re often not aware of the other interconnections. Here are several examples.

• Engineers look to technologies for solutions to water scarcity problems. If funding is in place, they try to integrate new (often expensive) sources into water delivery systems. They recognize how grey water can be utilized.

• Economists are involved in resource management and have a deep understanding of the impacts of water usage on water levels and flows at various points of the system. This understanding drives decisions on water permits.

• Environmentalists provide perspectives on ecosystem sustainability. Water has economic value, but often that value is non-monetary or difficult to quantify. Wetlands and estuaries contribute to the health of the planet: in Florida, rules on levels and flows attempt to incorporate impacts on biodiversity and sustainability. Questions raised are: What is the burden of proof for interacting with developers or with environmentalists? What is more problematic—erring on the side of environmental protection or erring on the side of development? What are the long-term consequences of either position?

• Ethos also needs to be considered because it deals with our personal values and notions of stewardship. As Floridians, we have a responsibility to ensure that the water is not given to us by our parents, it is on loan to us from our children. How to be good stewards of the land: “It was not given to us by our parents, it is on loan to us from our children.” How to be good stewards of the land, of course, is another question. So I see the water supply management issues as being extremely complex. Many perspectives are involved and all are necessary for sound public policy.

Do we have the right level and mix of professionals in the agencies addressing water supply management issues in Florida? The water management districts spend $1.7 billion on a group of professionals, on technical studies, and on a bureaucracy. I don’t know what their mix of hydrologists and managers are. I predict there aren’t very many economists in that group which, in my opinion, is a real mistake. Water management districts source out or conduct various kinds of economic studies: on pricing and elasticity issues. Nevertheless, it is easy for managers to hire people who think like them rather than to hire people who might be open to other perspectives on issues.

Another issue is state-wide data collection. The Council of 100 Report and the Chamber of Commerce Report emphasized the importance of some sort of organization to collect comparable data from the five water management districts and coordinate that effort. For the water management districts, that would be a change in their role, unless they perceived no threat from statewide analysis by hydrologists, ecologists, economists, and others. So I think information sharing is something that I would put on the agenda. That’s a very self-serving statement because I see the role of universities as very important in this area, but others may not.

Where is Florida today? Is there consensus regarding the best policy for water supply management? Is there clarity regarding science? Is there commitment of political authority: whether it’s top down or bottom up, it’s working. The scientific knowledge base is adequate for the decisions we are making. We’ve done the research and development and we know that we need to do more fine-tuning. It’s not a static world, it’s a dynamic world, but studies suggest that we are on the right path, we can feel good about that, and we have a deep personal commitment to fulfill those obligations. Arguably, markets or quasi-markets increase the likelihood of development, because they remove arbitrariness that is often associated with decisions to approve or disapprove consumptive use permits. I suspect few of us view Florida as being in a complacent situation now; otherwise why would we take valuable time to think about continued on page 31

The Askew Institute

Dr. Sanford Berg

“I think we need to see more attention given to educating the public regarding water as a unique contributor to the Florida environment.”
In the broadest sense, costs convey information and are not constraints on water allocation. Defining, understanding, discovering, and debating what are costs and what costs are worth bearing is a focus of water planning and decision making and of water conflict resolution.

**What are the costs of different choices?**

**Sources of Water Conflicts:**

There are four categories of water conflicts: value, interest, cognitive, and authority. Authority conflict results from the post-1970’s diffusion of power that was created by the form and number of environmental laws that were passed in that period. Since then, traditional federal, state, and local agency responsibilities for planning water supply capacity investments have competed in determining who decides how much water is needed, who should get it, and how it would be transferred.

Value conflict is over the desirable goals of public action and is somewhat ideological in nature. An example is opposition to desalination plants because they would “allow people to move into areas they shouldn’t be in.” It is simply a value as to where people “ought” to be living. Very often, water conflicts are caught up in that kind of discussion. They can only be resolved by someone making an authoritarian or democratic choice and saying it will or will not be this way. As an empirical matter, water supply cannot be an effective control on growth. Water will move to people where they are. The water supply planning and decision choices are reactions to larger actions and democratic drivers. In the case of Florida, the question is “How not ‘whether’ and not ‘can’ — Florida provide water in the dry years. Florida will and can, but at what cost and with what strategies?

**Value conflict arises when promised water allocations have a different effect on various consumer groups and those affected groups can block, or voice their opposition to or support for, a proposed decision.** Perhaps the best recognized example of interest conflict arises when a water transfer is proposed from rural to urban regions or water-rich to water-poor regions. The reasons for the conflict are often related to the perceived value of water in a given area; from the perspective of the group trying to get the water, the water is considered to be in surplus supply for the number of users or types of uses. The “so-called” water-rich regions want to keep their water because it is considered a guarantee of future prosperity. To lose any water is to lose that prospect. Not much water is involved in these interest conflicts.

Moreover, it doesn’t make any difference to development because water moves to people and not the other way around unless one is talking about beveries. Resolution of water use conflicts involves “water use requirements,” as opposed to just “water use,” and “safe yield,” as opposed to just “yield.” The movement of water from usage in one area to use in another area is a matter of interest conflicts occurs through bargaining and compensation. What is really often in dispute is not the water itself but rather the compensation payments for the water. Who gets to decide how much water space and who gets to use it? It will happen; the question is under what terms and at what level of discretion.

Cognitive conflict occurs when people start fighting over the data, the models, and the analysis provided by water experts and used by people making their value and interest arguments. There has been a rapid need to develop new models and technical data and data is recognized as the key to decision-making. Experts and stakeholders disagree on the data. This disagreement is not between experts and non-experts, but between experts in different disciplines. Each group sees the same data in different ways. The experts are the experts in the field, each expert is an expert in their sub-discipline, and none are experts in the other’s area of expertise. This is not a technical conflict; behavior is involved. One group is often told “you can’t do that,” while another group is told “you must do that.”

Reconciliation of cognitive conflicts is a task for analysts. It’s more likely that we can easily reach an agreement on technical issues than on value or interest-dominated issues, but the separation is not often clear. It’s more likely that we can easily reach an agreement on technical issues than on value or interest-dominated issues, but the separation is not often clear. It’s more likely that we can easily reach an agreement on technical issues than on value or interest-dominated issues, but the separation is not often clear. It’s more likely that we can easily reach an agreement on technical issues than on value or interest-dominated issues, but the separation is not often clear.
ECONOMICS OF URBAN WATER SYSTEMS – DOES THE EXISTING PARADIGM WORK?

BY DR. ROGER NOLL, MORRIS M. DOYLE CENTENNIAL PROFESSOR IN PUBLIC POLICY, STANFORD UNIVERSITY

Roger Noll, Morris M. Doyle Centennial Professor in Public Policy, Stanford University, shared his observations on the Economics of Urban Water Systems – Does the Existing Paradigm Work?

The New Paradigm: What does it mean to say that we need a new paradigm? The meaning here is that the traditional methods — the institutions, organizations, and ways of doing business for managing water for Florida, and indeed, for many eastern states — have become too inefficient, too iniquitous and too inflexible to cope with the growth in water uses. Tinkering won’t work, the system that Florida has designed to cope with the water problem during the 19th century and first half of the 20th century is fundamentally incapable of dealing with that problem in the first half of the 21st century. More recent institutions like water management districts still seem to have a technocratic approach to water allocation. A new model must be based on a greater integration of water supply across regions and across uses, implying the need for some centralized mechanism that does not currently exist at the state or even multi-state level...

The Problem with Old Water Allocation Systems: Until the middle of the 20th century, there was a basic abundance of water supply. Because of that abundance it was fairly easy to respond to localized production problems by building reservoirs and canals to transport the water. But as the demand for water increased, it became clear that the traditional methods of water allocation were inadequate. For example, the allocation of water to different states and regions was based on historical usage patterns and political considerations rather than on economic principles. In addition, the allocation of water to different uses, such as agriculture, industry, and urban development, was often done without regard for the costs and benefits of those allocations. The result was an inefficient and inequitable system of water allocation that failed to provide adequate water for all users.

The Future—Transferable Water Rights: Owens Valley in California has two counties — Inyo and Mono County. “County” in the west means “state” in the east. Inyo County only has 20,000 people in it, but it’s larger than Connecticut. Mono County is a little smaller with 10,000 people although it is certainly larger than Rhode Island. Florida has most of the water rights from Inyo and Mono counties through the Owens River Project, but didn’t get all the rights. There was one nice little community consisting of six farms in a little place called Benton, California, which is in Mono County. These farms were growing tomatoes to sell in the towns in Owens Valley: Mammoth and Bishop and Old Pine. The city of Los Angeles, during a drought period, approached the tomato farmers in Benton, all six of them, and proposed the following deal: We will buy 75% of your water, we will pay to plant orchards to replace the tomatoes, because the water use for orchards is much less than the water use for tomatoes, so your capital expense going into the orchard business will be totally paid for by the city of Los Angeles. From the 75% of water that we buy, we will give 25% of it to Mono County, to accommodate the growth in the city in Mammoth Lakes which is the largest ski resort in the United States. In addition, we will give 25% to Inyo County for the small towns along there for some of the farms, so we’ll pay all of this money for the water shipped to Los Angeles. The farmers are better off, the people who live in Mono and Inyo Counties are better off and the people who live in Los Angeles are better off. The water transaction had to be approved through a waiver by the state water board and the board rejected it on the grounds that these are “inalienable rights”. What in the world were these guys thinking? In Marin County, which is the county on the north side of the Golden Gate Bridge, there was insufficient water for residential use but there was water to grow tomatoes in the desert. This series of wildly inefficient allocations created a firestorm and caused the California Legislature to pass a new bill that allowed water transfers of both a sale and a lease variety — the lease variety known as “irreplaceable use”. This is the new paradigm, and what is going to happen in Florida sometime in the next 20 years is totally predictable. There will be a state-wide water allocation mechanism based on economics. The reason is that there is no way to avoid it.

Florida’s Choices: The argument that we shouldn’t let population and economics interfere with the optimal allocation of water suggests that democracy does not matter, and the market evaluations implicit from exchanges do not matter. We should throw out relative values of use, throw out democracy, and use another set of criteria to allocate water and that is just nonsense. Even if one believes it is true, even if one believes that the highest and best use of water is not for human beings and it ought to be all taken away from human beings and given to something else, that is not the society we live in. Manatees don’t vote. What we have to do is create enough water for the manatees in a mechanism that does not cause harm for the people who live in Miami-Dade County and in Tampa Bay. We have to accommodate the humans with intensity of demand and the fact that they vote, or else the manatees will not survive. The most effective and efficient mechanism for accommodating them is a regulated market system. In one or more droughts from now on, the system will collapse, and the only question is: will we respond in a fairly easy painless way or will we really shoot ourselves in the foot first — that is the choice. In fact, in many states in the west, the decision was “let’s shoot ourselves in the foot first.” The outcome involved real hardship and pain and caused some state legislators and governors to lose office. Incumbent politicians in Florida are advised not to take that path.
Dr. Christine Klein, Professor, Levin School of Law, University of Florida

Dr. Christine Klein

"Although there may be plenty of water in absolute terms, there's a geographic and temporal mismatch of supply and demand. Simply stated, water is not where we want it, when we want it, and in the quantities that we want it. People tend to settle, play, and use water in all sorts of places without regard to natural distribution patterns. So water suffers from a special kind of scarcity. In order to deal with that scarcity, the Florida Legislature enacted the Water Resources Act of 1972, codified as Chapter 373 in the Florida statutes. Florida's water legislation is widely regarded as one of the most comprehensive, thoughtful statutory systems in the east. Florida statutes, unlike those of many states, provide for the regulation of both surface water and groundwater. The important basis for the administrative framework of Florida water law is the water management district. Florida's five independent water management districts are divided along surface water boundaries — surface basins — and this is actually a very progressive idea. However, there are a few wrinkles. For example, the surface water boundaries are an imperfect match with groundwater basins. In Florida, about 93 percent of the population is dependent upon groundwater supplies for drinking water. Groundwater regulation has typically lagged behind surface water regulation in Florida and throughout the country. Water management district lines also do not correspond to political lines, most importantly county lines. This mismatch may set the stage for competition among the various districts for groundwater resources. Under the common law, western states have followed some variation of the prior appropriation doctrine in developing their water laws. Through this priority system, water rights generally take on the value of private property. In order to take back a water right from someone, even for environmental needs, one might resort to a 5th Amendment takings claim and compensation might have to be paid for that water right. Florida's statutory water law system has an element of priority embedded in it. The priority system is good in terms of certainty—everyone knows the rules of the game and that is important for long-term infrastructure investments. The drawback is that the priority system makes it very difficult to be flexible and respond to changing conditions and changing social values. Eastern states, including Florida, historically subscribed to the common law riparian system where the right to use water is tied to the ownership of lands that border along a natural water course, a lake or a stream. The advantage of the riparian system is that it is very flexible. The disadvantage is a lack of certainty about whether a withdrawal will be considered "reasonable" in future years or will be subject to law suits. Florida's Chapter 373 effectively replaces the common law riparian doctrine in Florida. However, the riparian legacy and culture is still evident in court cases and certain aspects of it continue to influence the resolution of water questions. Florida's water management districts have the authority to promulgate rules that have the force of law. The districts also have the ability to levy ad valorem property taxes on land owners within their jurisdictions. They also may issue consumptive use permits and environmental resource permits. The Department of Environmental Protection has general supervisory authority over the water management districts. In practice, the DEP has delegated most of the day-to-day functions to the water management districts. Indeed, and this is pretty unusual, Florida's statutes actually command the DEP to delegate authority to the water management districts to the greatest extent practicable. Florida's water law, by design, is very much a bottom-up kind of system with all the advantages and disadvantages that such a system may entail. The Water Resources Act authorizes, but does not require, Florida's water management districts to impose conditions on the proposed consumptive use of water. Only the South Florida Water Management District has implemented this system aggressively, regulating water withdrawals that are less than 100,000 gallons per day, the other districts focus primarily on the larger withdrawals above 100,000 gallons per day. So there is ample legal authority for much more aggressive permitting requirements if districts decide to do that at some point in the future. By law, the districts, however, must recognize certain exemptions from permitting; primarily, they may not require permits for individual consumption of water for domestic purposes. Both surface and groundwater withdrawals are subject to the permitting requirement. A criterion for permit approval is that the proposed use of the water must be "reasonable" and "beneficial," which merges aspects of western common law (beneficial) and eastern common law (reasonable). These terms provide quite a bit of flexibility but they also are understood to have qualitative and quantitative dimensions. Another criterion for approval—the proposed use will not interfere with existing legal uses—provides that a presently existing legal use will be grandfathered in and be given preference over any future uses. The third criterion requires the proposed use to be in the "public interest." The term "public interest" is a discretionary, subjective term, the interpretation of which will, no doubt, change over time. Permits are generally valid for up to 20 years, although in practice they are rarely issued for that length of time; they are generally valid for up to 50 years for municipalities, public works, public service corporations, and governmental bodies. Priority also comes into play with permit renewal applications because they are given preference by statute over applications for new consumptive use permits. Moreover, there are water use classification systems. The districts and the DEP must develop classification systems so that, in times of water shortage, usage is cut back, generally proportionally, in accordance with particular classes of use. And finally, permits can be revoked for two or more years of non-use or for other factors, such as violating the terms and conditions of the permit. Florida law provides environmental protection through statutes governing minimum flows and levels. The statutory definition of "minimum flow" refers to the limit at which further withdrawals of surface water would significantly harm the water resources or ecology of the area. The statutory definition of "minimum water level" refers to the limit at which further withdrawals of groundwater would significantly harm the water resources of the area. Florida's statutes also authorize "reservations" for water that may be removed legally from available future use. Water reservations have been particularly controversial and mired in litigation in the face of the Everglades restoration efforts. One piece of litigation concerning this $8 billion个项目 is currently pending before the United States Supreme Court. The case involves the Everglades National Park System and the Kissimmee River Restoration Project, which seeks to restore the natural water flow that was disrupted by the construction of the St. Johns River Waterway. The case raises important questions regarding the application of federal environmental laws to water management activities in the state of Florida. The court will have to decide whether the project violates the Endangered Species Act, the National Environmental Policy Act, and other federal statutes. The outcome of this case could have significant implications for water management in Florida and beyond. It will be interesting to see how the court rules and whether this project moves forward as planned.
The Askew Institute

RECOMMENDATIONS

General Observations by Discussion Group

Participants:

I. Public education:
Each group decided that the need to educate Floridians and policymakers on the state’s water situation was of paramount importance. Water management is a complicated issue: conservation will require people to change long-established habits. For this reason, all of the discussion groups included in the recommendations are the following:

a. A survey should be conducted to determine what consumers know about water issues so that a more effective public information campaign can be developed.

b. A state water data clearinghouse should be established at a state university in Florida to provide a uniform source of information and to avoid duplicating data gathering efforts.

c. Water Day should be celebrated and used to provide Floridians with information on water management. The water management districts and the Florida Department of Environmental Protection should conduct this information campaign.

d. Water bills should include consumers’ usage history and how their use compares to others.

II. Policy:
Policy recommendations ranged from the general to the specific. Each group stated that one of the major obstacles in addressing Florida’s water crisis was the lack of adequate public policy measures. Several groups also noted that, despite the need for better policy development in Florida, our state has done better than many others in trying to balance new water resource development and water conservation.

a. Florida must develop better mechanisms for consensus building about water. This includes more collaboration among stakeholders and using mediation before litigation.

b. We provide the same minimum protection to all natural systems as has been given to the Everglades, by reserving a sufficient supply of water before allowing permitting. We cannot afford to lose more precious natural systems to poor water management.

c. Water bills should include consumers’ usage history and how their use compares to others.

d. Water rates should rely more on water usage history and how their use compares to others.

e. Additional funding is needed to develop alternative water supply mechanisms for surface storage and desalination. Such funding should focus on demonstration projects. General subsidies from taxpayers violate the “beneficiaries should pay” principle.

f. More land acquisition, either through public or private means, is essential for the creation of designated water conservation areas.

III. Governance:
In the area of governance, it was widely felt that there was the need to better coordinate decision making among the stakeholders, to enhance accountability for water in comprehensive plans, and to keep this issue in the minds of policy makers.

a. Coordination must be enhanced among policymakers and the public and not relegated to the back burner. Current technical forums tend to encourage the status quo.

b. More accountability for water infrastructure in our comprehensive plans.

c. Approval of consumptive use permits should be conditioned upon incentives for conservation. One group was especially concerned about the high use of water in agriculture and felt that farmers and growers needed to re-use water to a greater extent than is currently the practice.

d. Florida’s water rates should rely more on user charges and fees to pay for operation and maintenance of our water infrastructure as well as provide for capital investment. Water rates should be structured to promote conservation. Water tariffs or other funding mechanisms should be structured to accommodate disadvantaged consumers.

e. We need incentives for Xeroscaping and exotic removal.

f. We have to realize that desalinization takes an enormous amount of energy.

III. Technology:
Participants concluded that new technologies will make water conservation and purification easier and, in some cases, less expensive in the future. However, they also agreed that Florida cannot afford to wait for advances in these technologies.

a. It is important that Florida increase research and funding for new technologies, especially membrane research, to improve desalinization and purification efforts. Water purification should be established as a state and national priority.

b. “Realization can be done. I cannot envision not doing this. Saudi Arabia gets much of its water from desalinization.”

— Rue Benyman

c. “Surface storage is something we have to look at.”

— Jon Mills

d. “We need to stimulate citizens to discuss and plan for our future.”

— Reubin Askew

e. “We have to realize that desalinization takes an enormous amount of energy.”

— Charles Ohlinger

f. “We need more accountability for water infrastructure in our comprehensive plans. Waiting until local governments want to rezone an area is too late.”

— Jon Thaxton

g. “We have to realize that desalinization takes an enormous amount of energy.”

— Jon Mills

h. “We need incentives for Xeroscaping and exotic removal.”

— Richard Pettigrew

e. “We need incentives for Xeroscaping and exotic removal.”

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f. “We have to realize that desalinization takes an enormous amount of energy.”

— Charles Ohlinger

g. “We need more accountability for water infrastructure in our comprehensive plans.”

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i. “We need incentives for Xeroscaping and exotic removal.”

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j. “We have to realize that desalinization takes an enormous amount of energy.”

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Addressing the water supply issue in Florida requires consideration of a number of intertwined questions. How has water resource and supply planning evolved to respond to projected increasing demand? With respect to meeting growing demand, what measures have Floridians taken to curb consumption or expand water supply? How have water resource and supply planning efforts addressed environmental considerations, such as the preservation of wetlands, springs, and the Everglades, for which Florida is famed? From an economic perspective, is Florida’s water priced efficiently to capture all the costs that underpin long-term water supply sustainability? Is Florida even on the right trajectory toward achieving such sustainability? The following overview addresses these questions.

**Background**

Approximately 90 percent of Florida’s drinking water comes from groundwater and the other 10 percent from surface water. The looming problem is that groundwater withdrawals are projected to outstrip demand in some regions of the state unless creative solutions are found. Florida’s population in 2000 was almost 16 million, but it is expected to increase by over 41 percent to 22.6 million in 2020. At the same time, demand for potable water is expected to increase from 7.7 billion gallons per day in 2000 to an estimated 9.1 billion gallons per day in 2020.

Rainfall in Florida averages 54-55 inches annually. Only Louisiana has a higher average rainfall than Florida. But rainfall is highly variable from year to year, ranging from 30-80 inches annually. Moreover, over 70 percent of annual rainfall is lost to evaporation and only 30 percent finds its way to bodies of water or aquifers. The water then flows to the sea, along the way sustaining important natural areas such as the springs, the Everglades, crystalline streams and winding rivers that are of great importance to the maintenance of biodiversity and to recreational opportunities for residents and tourists alike.

The distribution of rainfall and social demands on water are also highly variable throughout the state. Not surprisingly, the south, southwest regions, and central regions of the state have experienced the greatest population increases relative to groundwater supply. So the pressure on planners to come up with alternative supply sources and measures – reclaimed water, water from storage and recovery, desalinated water —has been stronger in those regions than in the northeast and the Panhandle.

**Florida’s Water Supply Planners/Providers**

The entities responsible for water resource development and regional water supply planning at large spatial scales are Florida’s five Water Management Districts: Northwest Florida WMD, St. Johns River WMD, Suwanee River WMD, Southwest Florida WMD, and South Florida WMD. Each district may levy property taxes and also receives local, state and federal funding. Legislation enacted in 1997 requires the WMDs, as part of the planning process, to develop regional water supply plans that project water needs for a 20 year period and identify where traditional water sources are not likely to be adequate to meet those needs. These plans must include a list of water source options that will meet projected needs and also take into consideration natural ecosystems.

Legislation enacted in 2004 authorizes the WMDs to promulgate rules that identify preferred water supply sources as a means of improving long-term water use efficiency.

At the municipal level, Florida’s 146 water supply and irrigation utilities are responsible for actually supplying the water (although funding assistance for that purpose may come from WMDs). Florida law provides that the planning, design, construction, operation and maintenance of public and private facilities for water collection, treatment, and distribution for sale, resale, and end use is predominantly the responsibility of those utilities.
In 2002, local governments have been required to address water supply infrastructure (treatment plant capacity and pipes) in their comprehensive plans.

### The Development of Regional Impact (DRI) Process

Land use planning is another important dimension of water resource and supply planning. Enacted in 1972, the Environmental Label and Water Management Act established the DRI program that preceded the comprehensive plan requirements referenced above. The DRI program has several environmental and planning objectives, including “ensuring a water management system that will reverse the deterioration of water quality and provide optimum utilization of our limited water resources.” Any development that is determined to have a substantial impact upon the health, safety, or welfare of citizens in more than one county is subject to the DRI process. State, regional, and local agencies must review those projects defined as DRI for projected impacts on regional facilities and resources.

### Environmental Considerations

Underlying much of Florida’s water planning policies to date is the assumption that population growth is generally good for economic development and that the influx of new residents to our state is inevitable. Yet we know growth exacerbates water problems and that poor development planning and unsound practices have had adverse effects on our environment and water resources.

One need only consider the example of the engineered patterns of water flow in the Everglades and in rivers and springs that massive damage to a fragile ecosystem will be extremely costly to reverse, assuming it can even be reversed at all.

Florida’s policymakers have also come to appreciate the importance of environmental considerations in water management planning and implementation. The review process must determine how regional impacts will be mitigated. Developers must obtain a local government development order to define mitigation conditions and submit to administrative review at the state level. How to improve coordination of the comprehensive plan amendment process with the DRI process is currently a matter of debate because they are different procedural activities with different standards and approval requirements.

### Conservation and Increasing Water Supplies

Florida WMDs have responded to projected increased demand by promoting several strategies that encourage conservation. The term “conservation” here refers to any action or technology that leads to permanent and cost-effective improvements in water use efficiency. Perhaps one of the most significant conservation measures in Florida has been the reuse of reclaimed water. Approximately 600 million gallons of reclaimed water is used each day for beneficial purposes, including irrigation of 154,000 residential lawns, 427 golf courses, 486 parks, and 213 schools. Benefits from water conservation initiatives include: (1) saving money because costs can be met less expensively than if new supplies are developed; (2) expanding water supply because conservation has the same net effect as new supply development, and (3) protecting the environment from the adverse effects of over-withdrawal and the development of reservoirs, pipelines and well-fields.

### What Price Water?

Water can be viewed as a basic right, but water is also a commodity, subject to the usual economic pulls of supply and demand, as constrained by public policy and environmental considerations.

One method of curbing water use and thus reducing conflicts over water in Florida and elsewhere is the adoption of more efficient pricing and funding mechanisms to capture the real cost of supplying water. The World Water Council ranked 147 countries in terms of water use pricing and the United States came in last. For example, Germans pay $1.78 per cubic meter of water, the French, $1.08, the British, $1.23, and the Americans, only $0.54.

It would appear that water is unusually cheap in the United States. There may be compelling societal arguments for maintaining low prices for water supply (the “basic right” argument), but Florida should consider three implications of such low costs.

1. **Dealing with Infrastructure Decay and Growth**

   Utilities’ infrastructure needs to be replaced over time and pricing water supply too low (below-marginal cost charges to customers) typically results in inadequate long-term capital investments. The water supply industry is very capital intensive because almost every component of the water delivery system – capturing, treating, transporting and disposal – must be replaced over time. What water supply companies do not capture from their customers is water “lost” in the system and paid for by all other customers as a hidden subsidy.

2. **Environmental Concerns**

   Water should also be priced to include environmental impacts, both short- and long-term. Robert Glennon observes, “Water rates, with rare exceptions, do not include a commodity charge for the water itself. The water is free. As a consequence, this pricing structure shunts off on other customers (or on society generally) many other costs: groundwater uses do not pay, for example, the cost of harm to rivers and riparian habitat, of dried-up lakes, of water-quality degradation or of subsidence caused by groundwater pumping.” Given the broad environmental impacts of water use in Florida, Floridians need to be concerned about the best ways of integrating environmental concerns into the state’s water policy.

### Influence on Consumption Behavior

Absent pricing schemes that capture the true costs of water use, consumers will not be able to respond rationally to conservation signals. Although the jury is still out as to their effectiveness, experiments with watering restrictions and seasonal pricing are often included in the mix of approaches used by water companies to send their customers conservation signals.

### Path to Long-Term Sustainability

There are five approaches that might assist water supply efforts in Florida:

1. **Regional approaches**

   - Local governments could be encouraged through state and regional incentives to band together to purchase raw water.

   - Regional approaches are also encouraged by the need to cooperate in managing the water supply than to continue the costly downward spiral of water wars.

   - According to an economic impact study (2003) conducted for the Florida Department of Environmental Protection, tourism spending at four tourist destinations in Florida has been $68.5 million in 2002 to surrounding local economies.

   - There are five approaches that might assist water supply efforts in Florida.

2. **Incentives**

   - Government incentives could be implemented to encourage water conservation alternatives that have the effect of reducing groundwater withdrawal. For example, the South Florida WMD and the Florida Department of Agriculture and Consumer Affairs have participated in the design and construction of excess water (tailwater) recovery structures.

Since 2002, local governments have been required to address water supply infrastructure (treatment plant capacity and pipes) in their comprehensive plans.
systems. These systems involve farmers, production water that originates from a surface or groundwater source. That water is used to irrigate crops, tailwater from that irrigation is then captured and stored for future use, particularly during the dry season when there is peak demand.

3. Benchmarking. Establishment and implementation of benchmarking and performance standards can go a long way toward managing monitoring management objectives affecting water conservation, water quality and water supply efficiency. An example of benchmarking for Florida’s WMDS is the most recent Florida Water Plan Annual Progress Report (October 2004), which compares the measurable performance of the WMDS in meeting several objectives related to water supply, flood protection, water quality, and natural system protection.

4. Science-based Policy. Investments in research are needed to identify both the biological and chemical contaminants that could threaten water supplies and the methods of removing those contaminants without adversely affecting health and the environment. Further scientific research will be needed to improve policies governing wetlands management, the treatment of drinking water supplies, the use of water in agriculture, the maintenance and preservation of aquatic habitats and species diversity, wastewater treatment and reuse, and flood and drought management. Addressing these topics should take account of broad patterns of water availability and flow at regional and state scales.

Heightening Public Awareness. The public’s eyes often glaze over when water issues come to the fore. It’s always easier to raise public awareness about threats to specific water bodies, as supporters of the Everglades restoration projects and the Florida Springs Task Force initiatives have discovered. People respond best, for example, to concrete examples and understand connections between the adverse impacts of reduced water flow at Blue Spring in Volusia County and fewer manatees visiting the spring each winter.

Conclusion. The collision course between the supply of and demand for water resources in Florida can only be averted through scientifically-supported, outcomes-based strategies that provide incentives for innovation and coordination, as well as mechanisms for long-term planning.

The Water Management Planning Roundtable was moderated by Dr. Joseph Delfino, University of Florida. Panelists included: Dr. Lance deHaven-Smith, Director, Reubin O’D Askew School of Public Administration, Florida State University; Tom Swihart, Administrator, Office of Water Policy, Division of Resource Management, Florida Department of Environmental Protection; and Mr. Steve Seibert, Attorney, Seibert Law Firm.

Dr. Delfino outlined the challenges facing Florida’s water supply: population growth and urban expansion, annual and seasonally variable drought cycles, dependence on groundwater for potable supply, real or perceived conflicts among and within regions for water allocation, water contamination, and the Everglades Restoration initiatives. An additional challenge is the ongoing transformation of farmland to development because ensuring adequate food production and economic stability means giving the green light to where it is needed. Hydrological and logistical issues will make cost estimates more acute. The implementation of existing laws and regulations along with average or above average precipitation will ensure future water supplies. However, if implementation of water laws and rules slows or fails or extended periods of drought prevail, both sustainable water supplies will be at risk. The overriding question facing Floridians is: will we be able to come together and solve our water supply problems?

Dr. deHaven-Smith contended that Florida’s water issues are not difficult from a technical perspective; we have large quantities of water although we may need to share it. The reason water supply problems cannot be resolved is mostly due to a lack of trust. People feel that those in power have a hidden agenda and therefore are less willing to compromise. What Floridians need for leadership that will encourage public buy-in and support. Florida is currently headed toward a concurrency crisis. Legislation is now under consideration to condition local government approval of development on identified water sources and a funding stream.

If there is no state funding for this measure, Floridians could face the same situation they faced in the mid-1980s when there was a concurrency requirement for road development but no funding. This situation had the unintended consequence of road developers shopping in rural areas for development sites, the long-term outcome was urban sprawl. So this measure, while well intentioned, could actually promote rather than contain urban sprawl. It could also spawn knee-jerk public reactions. One strategy for addressing water supply problems is for the state to cordon off certain areas and decide not to develop them. Ultimately, if we want to move forward on water issues, we will need to restore trust in government.

Mr. Seibert outlined the overall framework and oversight responsibilities of the entities that manage Florida’s water supply. He provided data on the withdrawal of Florida’s fresh water compared to that of other states, noting that Florida withdraws less fresh water per day than 13 other states. Agriculture accounts for the largest water consumer and half of the water is withdrawn within the jurisdiction of the South Florida Water Management District. Water supply and resource development funding is projected to be $12.2 billion over the next 20 years; $7.1 billion is projected for alternative supply water development during that period.

The average per capita use of water is less in Florida than in the U.S.; however, certain counties, such as Seminole, Ocala, and Dade, exceed the Florida average. Conservation is one approach to reducing per capita water use. Several measures that have promoted water conservation include: the Florida Water Conservation Initiative (2002), which culminated in long-term recommendations for improving water conservation; the Conserve Florida Work Plan, which seeks to improve evaluations of water conservation programs and practices and foster information sharing; and implementation of 2004 House Bill 293, which requires the Department of Environmental Protection to submit a written report on the progress of the water conservation program, including any statutory changes and funding requests necessary for program continuation. A few years ago, Florida was the epicenter for drought. The state is now experiencing rain. With the implementation of conservation measures, Floridians should be better positioned to deal with future droughts.

Mr. Seibert observed that the water conversation is better now than in past years. It is more result-oriented, regional, inter-disciplinary, and collegial. Years ago, there were urban versus rural interests and everybody versus water management districts; only 12 people understood water issues. The conversation has expanded since those days. Now, the Governor and the Legislature are talking about water. Agricultural and public supply users are at the table for roundtable discussions.
The Environmental Constraints for Water Supply Planning Roundtable was moderated by Dr. Richard Hamann, University of Florida. Panelists included: Ms. Victoria Tschinkel, Director, The Nature Conservancy – Florida; Mr. Harold Wilkening, Director, Water Supply Planning and Water Use Regulation, St. Johns River Water Management District; and David Richardson, Director, Wastewater and Water, Gainesville Regional Utilities.

Dr. Hamann provided a brief overview of the legislative requirements in the Florida Water Resources Act (Chapter 375) pertaining to consumptive use permitting, the definition of “reasonable-beneficial use” as a criterion for withdrawals, and statutory safeguards against adverse environmental impacts, including public input standards, minimum levels and rules, and reservations. The permitting system has an opportunity every few years to evaluate if a particular consumptive use has an adverse impact on water resources. The permitting system, however, is not designed to look at cumulative impacts of consumptive uses. So there are minimum levels and rules and reservations. There is one only reservation to date in the St. Johns River Water Management District (SJRWMD), but there will be more many in South Florida due to a special process for designating water reservations in the Comprehensive Everglades Restoration Plan. The President and Governor Agreement of 2002 prohibits consumptive use of water from projects in the Plan until such time as water reservations are from projects in the Plan until such time as water reservations are established consistent with the CERP. This prohibition needs to be made in the permit applications based on each user’s or utility’s proposed, spatially-based plans. A big change in the 2000 plan was the determination that the projected water demand for the next 20 years will not be met exclusively through new wellfield development. Because of the limited supply of fresh groundwater in East Central Florida to meet projected demand, the SJRWMD 2000 Plan determined a need of 100-200 mgd of additional water from alternative water sources by 2020. The SJRWMD 2004 interim plan identifies 14 projects for alternative water supply development and sets target dates for implementation. The Water Utility personnel would talk to regional water management district staff who, in turn, would talk to the personnel at the Department of Community Affairs. Water utility personnel would talk to regional water management district staff who, in turn, would talk to the personnel at the Department of Environmental Protection. But the water planners were not used to dealing with the land use planners. That changed with passage of legislation requiring local governments to coordinate their comprehensive plans with the water management districts’ regional water supply plans. Since that time, water management districts and local governments have been truly working together to come up with enough alternative water options to meet demand in 2020.

Regional efforts are underway to expand water supply planning with the use of alternative sources. For example, the Taylor Creek Reservoir Expansion Project involving the planning efforts for the TCRWR utilities to expand 10 mgd of water supply to 50 or 60 mgd or more. Other regional approaches include Tampa Bay and the Water Authority of Volusia. The technical issues are not difficult. The real issues are in implementation, particularly through water conservation. Alternative water supplies can be made more affordable if they supplement fresh water supplies. Conservation measures can potentially play a role in lowering the percentage of more expensive, alternative sources in the water supply mix; this blending of fresh and alternative sources with their associated costs can ultimately be reflected in more affordable water prices to consumers. Regionalization and collective effort might give us the most water at the least cost but historically it has been difficult to achieve. To date, utilities have worked together to increase water supply incrementally but more can be done. Finally, there is considerable uncertainty about when Florida will run out of water. Florida will run out of fresh water but if there are alternative water sources, utilities will be better positioned to respond.

Ms. Richardson explained that water supply development in Alachua County, served by Gainesville Regional Utilities (GRU), is constrained by potential impacts on wetland water, potential impacts on surface water, and, to a far lesser extent, potential impacts on springs. Water supply withdrawals and environmental protection may have competing objectives but these objectives are still compatible. For example, GRU purchased conservation easements for future water supply expansion but those tracts are also used to protect wetlands located near wellfields. Water supply withdrawals are very site-specific so utilities depend on accurate geo-hydrological models to better understand the possible effects of withdrawing water at different rates at a given site. These models are particularly useful in projecting the effects of hydrological changes on the environment 20 years in the future. Utilities’ models do not always mesh with water management district models which are more regional in scope so utilities try to work with water management districts to come up with an agreed-upon model that can be used for consumptive use permitting. GRU is currently working with the SJRWMD to that end. Conservation has caused the per capita use of GRU’s residential consumers to decrease by 15 percent over the past 15 years. This reduction was in part due to the use of invented bluegrass lawns, where irrigators pay more per gallon than lower volume users. One of the unintended consequences of water block rates is that irrigators are installing their own wells and by-passing GRU. In doing so they are using much more water than they consumed from the GRU system. Other GRU measures to promote conservation are extensive public and employee education, water audits, and promotion of Xeroscape landscaping. Another change is the way people use water. The widespread use of automated sprinkler systems has meant the time of peak demand has shifted from early mornings from less concentrated time periods. If GRU is unable to modify user behavior sufficiently, it has several options for meeting projected demand: expanded use of reclaimed water, reduced pumped water use with wells, and the use of alternative sources such as retrofitting wells, optimizing existing wellfields, developing satellite wellfields, developing alternative supplies, and directly addressing wetland mitigation impacts.

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WATER MANAGEMENT PLANNING ROUNDTABLE DISCUSSION

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ENVIRONMENTAL CONSTRAINTS FOR WATER SUPPLY PLANNING

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Overview of Tampa Bay Water

By Paula Dye

Tampa Bay Water is a nonprofit governmental agency created by the counties of Pasco, Pinellas and Hillsborough through the cities of Tampa, St. Petersburg and New Port Richey under legislation that allows local governments to join together to develop and manage water in a comprehensive manner. The total level of groundwater use in the region has not changed.

CAUTION AREA:

Groundwater withdrawal impacts on lakes and aquifers. The extent of those impacts is certainly debatable given development, drainage, and climate variability. When the wellfields were first developed in the 50’s and 60’s, there were very few people living in northwest Hillsborough County and Pasco County. As more people moved in, the Tampa Bay area where the water wars originated. Pumping of wellfields in the area caused aquifer levels and lake levels to drop significantly in the 1960s and 1970s. The West Coast Regional Supply Authority, the Tampa Bay Water Authority. The idea was to bring in an incentive-based funding to the table to solve the problem rather than to fight over the magnitude of water withdrawal.

The first case study is about the northern Tampa Bay Area where the water wars began. Minimizing rate impact is also an important goal in the water wars. We have recognized that the cost of water has risen significantly and that there is only so much that the general public is able to go on a certain parameter. That is a sustainable stream-type water supply. We have also built a surface water treatment plant that can produce 66 million gallons per day. Finally, the Tampa Bay Water system has been developed to supply the needs of the region for up to 200 days. The goal of that effort is to get us through dry conditions and drought conditions. The last piece of our alternative supply puzzle is the Tampa Bay desalination plant. It is operational, but the contractor did not build it to the performance standards that we had set. We still have a new contractor making sure that it can operate as close to its potential as possible. It can operate and produce 25 million gallons a day and should be fully operational in 2006. The result of these initiatives is that last year we actually operated them below the 90 mgd ceiling, which we were required to obtain in 2008. In other words, we met our goal, yet, the legislation should not only be able to provide as cost-effective as possible.

Paradigm Shift:

We really made a paradigm shift in water supply planning on Florida’s west coast about ten or fifteen years ago when we began developing more alternative supplies. Prior to that time, the paradigm was to sink a well in the ground and withdraw groundwater. The primary alternative supply source is actually captured wet-weather flows that come down the river. The challenge is storage of that captured water. If we can combine productive use of this water together with conservation, reclaimed, and alternative supplies, we should be able to meet the needs of all our customers with local sources through 2050. A better understanding of long-term and short-term climate impacts on river flow also aids the WMDS in water supply planning and setting minimum flows and levels. For example, the Peace River Cumulative Impact Assessment provides us with insights about the importance of climate cycle impacts on river flow.

Tampa Bay Water Wars—Regional Partnership:

The first case study is about the northern Tampa Bay Area where the water wars originated. Pumping of wellfields in the area caused aquifer levels to drop significantly in the 1960s and 1970s. The West Coast Regional Supply Authority, the Tampa Bay Water Authority. The idea was to bring in an incentive-based funding to the table to solve the problem rather than to fight over the magnitude of water withdrawal. The SWFWMD put $183 million on the table to develop alternative supplies, and more than $90 million in additional funding to implement water conservation projects that would curb demand. Per capita water use was at about 140-150 gallons per day per person in that tri-county area back in the late 1980’s-early 1990’s is now down to about 120-125 gallons a day per person.

In the past two years, the 11 wellfields in the Tampa Bay area were able to reduce pumping from 160 mgd to 90 mgd. This supply has been augmented by desalination producing 25 mgd and captured flood waters producing the remaining 60 mgd. To capture flood waters for future peak use, the SWFWMD built a thousand acre, 55-foot high reservoir that is in the process of being filled. In addition to the off-stream reservoirs, of course, the SWFWMD uses aquifer storage recovery (ASR).

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The Southwest Water Management District

By Mr. David Moore, Executive Director, Southwest Florida Water Management District

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On Florida’s west coast, in Manatee County, the first ASR system was erected along the Manatee River. There are three types of ASR systems – potable, reclaimed, and raw water. It is the latter – raw water – that has caused the most controversy and needs more research. Sarasota, Tampa, Charlotte County and Desoto County rely heavily on ASR technology.

Desalination is another option that works well in Tampa Bay because it is co-located with an existing power plant that had all the permitting completed and all the infrastructure in place. The SWFWMD works well in Tampa Bay is that Tampa Bay has half the salinity of the Gulf of Mexico but the large, less salty quantity of water from the Gulf – 1.5 billion mgd —drives the saltier water. The plant is currently in the process of pre-treatment rehabilitation but within 15-18 months, it should be fully operational.

Another source of water supply that will help SWFWMD meet project demand through 2020 is the Downtown Augmentation Project – a regional partnership of Tampa, Hillsborough, Pinellas and Pasco Counties. As more people moved in, the Tampa Bay area where the water wars originated. Pumping of wellfields in the area caused aquifer levels to drop significantly in the 1960s and 1970s. The West Coast Regional Supply Authority, the Tampa Bay Water Authority. The idea was to bring in an incentive-based funding to the table to solve the problem rather than to fight over the magnitude of water withdrawal.

Finally, the Tampa Bay region has the highest concentration of reclaimed water lines in the world. To induce local governments to supply reclaimed water, the SWFWMD pays $5 per dollar expended for those lines. Reclamation facilities still frit; once a few subdivisions get it, the surrounding subdivisions want it, so it’s worked our pretty well there.

Southern Water Use Caution Area:

The Southern Water Use Caution Area (SWUCA) includes all of DeSoto, Hardee, Manatee, and Sarasota counties and parts of Charlotte and Highlands, Pinellas and Polk Counties. The SWFWMD is trying to manage water in this region in a comprehensive manner. The total level of ground water use in the region has not changed.

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Water management is a complex issue and one the public does not understand well. The Orlando Sentinel is trying to educate the public on water for a number of years, and we recently completed a year-long in-depth series on this subject. There is no easy answer to water’s more difficult issue facing our state today.

The key to building better public policy on water is to develop a consensus on the extent of the water crisis, why we have a water crisis, and who is responsible. Right now everyone blames everyone else. There also is a disconnect between our current problems and the length of time it will take to resolve them. If we do not make better plans today, we will have fewer options in the future. For example, water managers need to be working with local government to identify sustainable water sources for new developments and a revenue stream to pay for it. However, the fact that we are unwilling to raise taxes complicates resolving the water crisis since it is obvious that providing adequate water for Florida’s future will require additional resources. Reuse systems, desalination, and other means of increasing the water supply, even educating the public about water conservation, are not cheap.

Those of you who are experts on water should be doing everything you can to communicate with the public and policymakers. You need to communicate with them in a concise and direct manner which engages their interest. Remember, this will be a long-term discussion which must engage all Floridians.

The Askew Institute used to replenish the environment. To less water than agricultural users and citrus subdivisions that are replacing agricultural season and release it to the Peace River in those areas could be moved inland to the Peace River is to capture water from Lake Hancock or other lakes during the wet years. However, certain challenges remain. The primary way to add water is to increase water supply to meet projected need. Yet, an unanswered question remains: how much since 1975; phosphate mining used not to approve growth that will lead to additional water shortages in the future. I am extremely encouraged that Governor Bush is taking this issue seriously. The new growth plan requires local governments to develop the management of water resources, and to what extent we can allow regions to conserve more water than nature provides by importing water from other parts of the state. We will see a push and pull among various regions in an effort to sort out the appropriate scope of their respective “water budgets.” Although arguments may be couched in scientific terms, this is really a matter of social policy and of what we think is best for Florida. Thoughtful scholars have noted that water law has always focused upon satisfying demand, rather than limiting demand to recognize some geo-hydrologic realities limiting supply. In western parts of the country, water transport over mountains and basins is routine; there the joke is that water runs uphill toward money. In Florida, uphill is a only few feet or inches. Nonetheless, certain conditions must be satisfied before the request to move water may be granted. These conditions are all couched in very flexible terms. However, a political debate rather than a legal debate will determine how, when, and whether we should move water around. Hopefully, we will give some very thoughtful consideration to all state needs—both human and environmental—and not simply let the water flow uphill toward money and let dollars and sheen voting power dominate.

COLORITON OF WATER AND LAND USE: The ongoing challenge is to find what has been called “the missing link” between water planning and land use planning. Currently, land use and water use planners are legally required to engage in some degree of consultation, and there are some very interesting bills before the Florida legislature to improve coordination efforts. This will no doubt be an ongoing struggle as population grows and water supply remains constant.

CONCLUSION OF WATER and LAND USE: high through is tapped and the only thing that is left is the ugly truth. The ugly truth through does require some assistance. We have two concepts that we are working on in depth. I am going to talk about the downstream augmentation of a couple of river supplies. The three keys to success that we have implemented to date are all coming out in this project as well.

The basic concept of this augmentation plan is to pump a gallon of reclaimed water downstream and take a gallon of surface water upstream. In that way we are protecting the environment by keeping the same quantity of freshwater in that stream system. Thereclaimed water is produced by the River of Tampa Bay and it is beautifully high quality. We want to pipe the reclaimed water to the stream location where we have existing intakes. The water will not be piped upstream, because we looked at that project back in the 1990’s and it was not acceptable to the community. Our local community did not feel comfortable with indirect potable reuse where you clean and drink the reclaimed water. They had a real variation on that idea. Instead of drinking it, we put it downstream and drink the surface supply. People will accept that and it meets the same goal of maintaining the flow in the river system.

This project is extremely expensive to do, however. It will cost about $90–$120 million for the required infrastructure. The water management district is funding 50% of the cost of the project and the federal government has appropriated $1.45 billion for the project for next year. We are working with the state as well. The planning coordination aspect is where it originated in the SWFWMD’s regional water supply plan. Regional cooperation includes not just the involved institutions, but also the larger project where the reclaimed water would use the same pipeline to go further north. We would take it for augmentation, and the city of Tampa, Pasco County and Hillsborough County would use it for irrigation projects. By working together and sharing the infrastructure, we can reduce the costs of those pipelines and we are able to afford what would be a really expensive project if it was built for each party individually. In that way, regional cooperation is, again, essential. Using cooperation, coordination and outside funding we believe that we have found the solution to meeting the long-term water needs of the Tampa Bay area.

The key to building better public policy on water is to develop a consensus on the extent of the water crisis, why we have a water crisis, and who is responsible. Right now everyone blames everyone else. There also is a disconnect between our current problems and the length of time it will take to resolve them. If we do not make better plans today, we will have fewer options in the future. For example, water managers need to be working with local government to develop the management of water resources, and to what extent we can allow regions to conserve more water than nature provides by importing water from other parts of the state. We will see a push and pull among various regions in an effort to sort out the appropriate scope of their respective “water budgets.” Although arguments may be couched in scientific terms, this is really a matter of social policy and of what we think is best for Florida. Thoughtful scholars have noted that water law has always focused upon satisfying demand, rather than limiting demand to recognize some geo-hydrologic realities limiting supply. In western parts of the country, water transport over mountains and basins is routine; there the joke is that water runs uphill toward money. In Florida, uphill is only a few feet or inches. Nonetheless, certain conditions must be satisfied before the request to move water may be granted. These conditions are all couched in very flexible terms. However, a political debate rather than a legal debate will determine how, when, and whether we should move water around. Hopefully, we will give some very thoughtful consideration to all state needs—both human and environmental—and not simply let the water flow uphill toward money and let dollars and sheen voting power dominate.

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CONCLUSION:}

Water doesn’t determine our standard of living. We can pay higher prices for water and ensure that our standard of living does not suffer. In fact, one of the insights that I think economics on water to the table is the discussion of trade-offs—the opportunity costs associated with gaining access to the value of that water to other parties who might be willing to pay for it.

Now I’ll turn to another insight from a colleague of mine at the University of Florida, David Sappington. David is one of the 50 most cited economists in the United States. He went to the Federal Communications Commission (FCC) for a year to serve as the chief economist. His experience there led him to conclude that the four main drivers of regulatory decisions are: (1) Politics; (2) Politics; (3) Politics; and (4) Economics. The first driver is politics because regulators are accountable to elected officials to spend 200 billion dollars on renewing our infrastructure. Every decade or so, there’s a big initiative and a pot of money is authorized in Washington, D.C. As the money gets dispersed, via the pork-barrel, around the nation. Because these are not loans or money from investors, consumers don’t face the true cost of improvements to their sewage systems. They can get someone else to pay for the improvements. The second driver is economics because the value of water and nutrients rises, reuse and desalination become more likely. The third main driver is autonomy. Tucson, Florida and Tenerife provide examples of water supply systems that have been particularly innovative in using new technologies to reuse water with great efficiency. The Orlando Sentinel several years ago had a wonderful series on water. We need to see more attention given to educating the public regarding water as a unique contributior to the Florida environment. The discussion in this state on important policy issues, like water, is sterile. It seems that most national policy debate is driven by talking heads who talk louder and louder. We still don’t have people engaging in and developing a sense of trust on important water policy issues. Thus, I think there is still a lot of confusion which leads to inaction. And I think we have a lack of transparency by some public concern. Unwarrranted complacency can bring us to crisis. That crisis could come from many sources. We will produce changes in attitudes and public policy or from cumulative poor performance which will lead to scientists and public consensus about what happens, for example, when we deny a river some flows or when we dredge at given sites. I think our personal values are very confused. I should thank the newspapers because periodically the Gainesville Sun will run a series of articles on water. The Orlando Sentinel several years ago had a wonderful series on water. We need to...
JOIN US AT THE ASKEW INSTITUTE FOR 2006

The Askew Institute will focus on “Child Welfare Issues in Florida and the Nation” at its 2006 meeting in partnership with the Institute for Child and Adolescent Research and Evaluation and Child Health Policy, University of Florida.

The meeting will open on Thursday at noon on March 30th with an opening address from our keynote speaker, and it will end on Friday March 31st with an open-ended discussion of recommendations for the future. In between, you will shape the direction of the meeting through wide-ranging discussions in small discussion groups. The resulting recommendations will reflect your conversations with the discussion leaders and with other participants.

Registration materials will be available in the fall of 2005. Please visit the Askew website at www.clas.ufl.edu/askew for more information. The meeting is limited to the first 200 registrants. We look forward to seeing you in 2006.

Past reports of the statewide and regional Askew Meetings are available. You can request them by simply filling out the form that follows:

2005 – How Should Florida's Water Supply Be Managed in Response Growth?
2004 – The Role of Philanthropic Organizations in Florida's Civil Society
2003 – The Health Care Crisis: Seeking Solutions for Florida and the Nation
2002 – Democracy and the Economy in Florida at a Time of National Crisis
2002 – Civic Education Workshop
2001 – The Children of Florida
2001 – North Florida's Regional Future (Marion County)
2000 – The Granting of Florida
1999 – A View of the 21st Century: Demographic Developments and Their Implications for Florida's Future
1998 – Florida and the Global Economy
1995 – Building Community in Florida

I am interested in attending the 2006 Meeting. Please send me ___ copies of the ______ report.

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Mail to: The Reubin O'D. Askew Institute, University of Florida, P.O. Box 117320, Gainesville, Florida 32611