

Water Issues in Florida: How Extension Can Facilitate Stakeholder Engagement and Involvement¹

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Introduction

The following EDIS publication is a brief description of recent discussions and policies surrounding water management, use, and quality in Florida. The goal of this publication is to provide brief, but clear, information about the trends in policies that can be used by Extension agents to increase educated conversations about water issues. Water in Florida is a contested issue, and Extension agents may be called upon as a source of unbiased information by the public. Having an understanding of important agricultural and natural resources issues in Florida, including water, can help facilitate conversation, raise awareness, and lead to informed decision making.

Water is one of Florida's most abundant natural resources. Water is a crucial resource that impacts not just the environment, but other important industries in Florida's economy, such as tourism, agriculture, retail, and real estate development. However, due to high population growth, development, and the agricultural needs of the state, the freshwater resources that Florida so heavily depends upon are being depleted. Additionally, the Florida Department of Environmental Protection (Florida DEP) has recently established new water quality regulations, and the process of establishing these guidelines has been fraught with conflict and disagreements. To avoid future water conflicts,

different interest groups need to understand the water concerns of all users in Florida and work together to find sustainable solutions.

Extension agents work in every county in Florida and are seen as representing federal and state agencies, as well as the state's land-grant universities. Therefore they can be a crucial point of contact for questions and information regarding water policy and policy implications. Their networks and connections within the community can help foster conversations about the changing water policies in Florida. By staying informed on these changing policies, regulations, and reactions regarding water, Extension agents can help decision makers and those who will be affected by changes in their counties understand these important topics. This document addresses the following issues related to water:

- **Heavy demand:** While Florida has an unusual abundance of freshwater resources, high levels of commercial, real estate, and agricultural development have caused withdrawals to increase over time, putting pressure on natural resources. According to the United States Geological Survey [USGS], from 1970–2010 withdrawals increased from an average of 5.6 billion gallons per day (bgd) in 1970 to 8.2 bgd in 2000. From 2000–2010 the water use

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has decreased to an average of 6.3 bgd in 2010 (USGS Florida Water Science Center 2010).

- **Changes in water use:** Agricultural production and public supply are the largest users of freshwater resources in Florida. In 2010, agricultural production used 2.5 bgd of water while public supply used 2.2 bgd. Large demands occur in municipal water supply systems as a result of landscape irrigation of lawns and golf courses. In 2010, the total fresh water withdrawals for recreational irrigation were 0.39 bgd (USGS Florida Water Science Center 2010).
- **Environmental consequences:** Depletion of groundwater resources can have negative environmental consequences, such as saltwater intrusion into freshwater resources and sinkhole development.
- **Water use strategies:** Strategies to balance water use include reducing the overall demand for water (through means such as increased water prices or restrictions) or increasing the supply of water (through means such as desalination of seawater).
- **Water quality:** Recent EPA nutrient requirements, designed to protect water quality, have sparked debate between environmental and agricultural interest groups that has resulted in the adoption of less stringent requirements. These debates illustrate the differences in opinions of various water users in Florida.

Background

Throughout its history, Florida has developed an elaborate series of canals to divert water away from floodplains in order to reduce flooding and make areas of southern Florida hospitable for real estate and business development (Barnett 2007). The average rainfall in Florida is 54 inches per year, which is about twice the national average (Carriker 2000). Additionally, Florida has an abundance of lakes (nearly 8,000) and the most concentrated amount of freshwater springs (over 700) anywhere in the world (Barnett 2007). The Floridan Aquifer is large and productive enough to supply groundwater resources not just to Florida, but to regions of Alabama, Mississippi, Georgia, and South Carolina as well (Carriker 2000). Unlike other regions of the country, particularly western states, Florida relies more heavily on its abundant groundwater resources to supplement rainfall to irrigate crops and provide drinking water resources for the population. Surface water provides approximately one-third of the water consumed in Florida, while groundwater supplies two-thirds (USGS Florida Water Science Center 2010).

Water management districts in Florida were established in 1972 to manage all water sources within the specified district boundaries. While not all states have water management districts, they play a vital role in Florida. The functions that are performed by the water management districts include researching water resources and their change over time, creating plans for water use in times of shortage/drought, managing water consumption by various users, and carrying out storm water management strategies required by Florida DEP (Florida DEP 2012). Florida has five water management districts (Figure 1).



Figure 1. Florida Water Management Districts.

Credits: <http://www.dep.state.fl.us/water/waterpolicy/districts.htm>

Water Use in Florida

In 2010, agriculture accounted for 40% (2.5 bgd) of freshwater withdrawal in Florida, closely mirroring domestic and public use of water, which accounted for 39% of withdrawals (2.2 bgd) (USGS Florida Water Science Center 2010). A recent report from the Florida DEP estimates that by 2025, the average daily water use in Florida will increase to 8.5 bgd (Florida DEP 2007). While agriculture is the largest user of water currently, during this time it will decrease to just 34% of total daily water use, while public use will increase to 43% due to population growth and demand for water (Florida DEP 2010).

Public demand for water has been increasing over time. From 1990 to 2005 the public demand for water increased by 30% (Marella 2008). The water needs of the developing areas of Florida—particularly south Florida—are complex. Not only do these areas need water for basic living and businesses, but golf courses and homeowners associations that require extensive irrigated landscapes put pressure on individuals to use water resources abundantly, causing large demands on municipal water supplies. In 2010, the total

fresh water withdrawals for recreational irrigation were approximately 0.39 billion gallons per day (USGS Florida Water Science Center 2010). Therefore, allocating water resources appropriately is an important challenge for state officials, business people, and the general public. Highly populated areas need a higher supply of water resources, making it likely that less populated areas will have to give up some of their own water resources (Carriker 2000). This redistribution is a source of conflict among Florida's residents.

Environmental and Natural Resource Consequences

Population increase plays a large part in demand for water. In certain areas of southern Florida, where population has increased and where water resources are more limited than in other areas of the state, naturally occurring water resources (such as aquifers) have been depleted significantly. For example, in the Southwest Water Management district (SWFWMD), the aquifer has been withdrawn enough that saltwater intrusion into the Floridan Aquifer is a concern (Carriker 2000). Water restrictions now occur throughout Florida, including restricting the hours when lawns can be irrigated, especially during months when rainfall is scarce.

Excessive demand for water resources can have other negative consequences. While sinkholes occur naturally, over-withdrawing groundwater, moving large amounts of water from one area to another, creating artificial ponds, and drilling new wells are all activities that can lead to or exacerbate sinkhole development (SJRWMD 2012). For example, during the particularly cold winter in 2010, water needed to protect berry and citrus crops near Plant City was pumped at a rate of more than one billion gallons per day for 11 days. As a result, 140 sinkholes opened up in communities near Plant City, and 750 wells used for drinking purposes dried up (SWFWMD 2011).

Water Use Strategies

While public water use is a challenge, there are currently ways in place to address the need to increase the supply of water as well as the need to manage the high demand for water. Capturing and storing surface and rainwater, using reclaimed water, and desalinating water are three strategies, from least expensive to most expensive, to expand the public stock of water. Unfortunately, all these strategies require substantial financial resources, and in the case of desalination plants, can have adverse environmental consequences and high energy use (Borisova et al. 2009).

Another way to handle water supply issues is to manage the public's demand for water resources. This can be done through enforcing irrigation restrictions for lawns, increasing the price of water usage during droughts, offering rebates to encourage people to replace inefficient appliances with efficient ones, creating educational programs, and establishing certification to show that a house, community, or lawn is water-efficient. While these strategies are much cheaper, they may be less effective, and they rely on public perception and actions. These strategies may also decrease utilities' profits and may adversely affect low-income customers (Borisova et al. 2009).

Water Quality Regulations in Florida

The agricultural industry faces its own water management challenges and requirements. Many of the water management restrictions farmers face deal with water quality, particularly since runoff from agriculture can pollute nearby streams, rivers, and lakes. Recently, there has been a debate over nutrient standards proposed by the US Environmental Protection Agency (EPA). Essentially, the EPA established nutrient requirements for Florida as a result of a legal suit by environmental groups who were concerned that the state was not complying with a set of federally mandated numeric nutrient requirements. The Florida water nutrient requirements developed by the EPA were then highly contested by those in the agricultural industry. They argued that following the EPA requirements would cost the industry enormous amounts of money. Eventually, the EPA's requirements were legally contested and replaced with new regulations composed by the Florida DEP (Hiers 2012; Obreza et al. 2010).

The conflict over nutrient requirements demonstrates the complexity of Florida's water quality issues. One of the challenges the Florida DEP cited was the abundance of varieties of water sources in Florida made creation of numeric nutrient requirements for each source very time-consuming. On the environmentalists' side, the need to protect streams, lakes, and other bodies of water from algae blooms and other signs of pollution that can be harmful to humans, wildlife, and tourism was very important. To be able to face current and future water quality and quantity issues, it is important that all sides of water use issues are able to understand and make informed decisions about how water is managed and used in the state of Florida.

Opinion Leaders' Perspectives on Water Issues in Florida

Agricultural and natural resource sectors have their own perceptions of water issues in Florida. It is important that Extension agents, who may be perceived as a “neutral party” between the public and agricultural sectors, understand these perceptions. In the spring and summer of 2011, a study took place with opinion leaders representing diverse agriculture and natural resource (ANR) industries in Florida. Respondents were asked questions about water regulations, water quality, and water supply. A cross section of all the major agriculture and natural resource industries was represented.

The 30 participants in the study were involved in the Wedgworth Leadership Institute for Agriculture and Natural Resources (WLIANR). WLIANR participants were selected as the target audience based on their opinion leadership role, nominations from industry, representation from agriculture and natural resource industries, and geographic representation across the state of Florida. Participants of WLIANR underwent a two-year training program where they learned interpersonal leadership skills, discussed critical agricultural and natural resource issues, and developed skills for working collaboratively with decision makers to build a sustainable agricultural and natural resource agenda. Of the 30 participants for this study, 60% were male and 40% were female, ranging in age from 27 to 55. Twenty-seven of the participants were White, two were Hispanic, and one was Asian.

All 30 participants responded to an online survey asking them about water issues in Florida. The first set of questions dealt with where the respondents get their information about water. Overall, the most common source of information was from the water management districts and agricultural associations and publications. Government entities (including the EPA) and the Internet were also cited. The least likely sources of information included news media and other people.

Next, respondents were asked what they thought policymakers needed to know regarding water, regulation, and immigration. These three issues had been previously identified by this group as being important to the agriculture and natural resource sectors. Respondents were asked what they thought policymakers should know about how these issues affect professionals and opinion leaders in this industry. When asked about water regulations and restrictions, respondents reported that they would like policymakers to know (in order of importance) that:

1. More science is needed.
2. The cost of implementation is burdensome.
3. It is difficult to comply with regulations.
4. There is a need to be and stay educated on issues of water regulation and restriction.

When asked about water quality issues, respondents reported that they would like policymakers to know (in order of importance) that:

1. Water quality regulations are “an unfair burden on agriculture.”
2. Realistic goals are needed.

When asked about water supply issues, respondents reported they feel it is important for policymakers to understand their economic concerns when it comes to altering water quality and quantity requirements for agriculture. Finally, when asked about water management issues and what they thought policymakers need to know, the respondents did not come to a consensus on what they thought was most important.

Overall, respondents reported they share information regarding water mostly with their friends, family, co-workers, and business associates. They were least likely to report sharing information with government officials and the news media.

Respondents were then asked about what outcomes they predicted in conjunction with each of the previously mentioned water issues. Regarding water regulations and restriction issues, respondents predicted that increased regulation, positive revisions, and compliance challenges were likely to occur. Regarding water quality issues, respondents predicted there would be “more regulation” and in their opinion, “impossible” standards to meet. With regards to water supply and water management, the respondents did not come to a consensus about what was likely to occur in the future.

Discussing Water Issues

For land-grant universities, Extension plays a crucial role in bringing the university’s applied research to people who can use it to improve their knowledge and their lives. Research has shown that Extension agents are a trusted source of information for producers and serve as opinion leaders within their communities. In order to be effective opinion

leaders, Extension agents must have specific competencies, including understanding the challenges associated with specific issues, their stakeholders' perspectives on these issues, and the communities in which they reside (Scheer, Cochran, Harder & Place 2011).

The information provided in this EDIS publication has been designed to enhance Extension agents' understanding of the history behind water issues in the state of Florida and the perspectives of stakeholders from an opinion leader standpoint. Extension agents are the best source of information within their own communities when addressing the needs of their particular audiences. But no matter how comfortable an agent might be with his or her clients, discussing volatile issues is never an easy task. Therefore, we offer the following questions as a way of framing the issues and starting discussion:

1. Why do you believe water issues are commonly referred to as the top issue facing the agriculture and natural resource industries in Florida?
2. Why do you think increasing/decreasing water quality and quantity regulations will assist in creating an environment that will allow for essential agricultural production while protecting natural resources?
3. What do you believe are the largest issues facing you, as you deal with water issues?
4. How does water regulation impact your business?
5. How do you plan to deal with the impacts water regulation has or will have on your business?

Conclusion

Agricultural access to water is an important public consideration because agricultural crops and livestock need water to successfully grow and supply the food system that feeds Floridians. Sustaining agricultural production while ensuring long-term environmental safety is a crucial consideration when it comes to how water is used in the state. Florida, while endowed with an abundance of freshwater resources and rainfall, faces challenges in managing and preserving the quality of these resources. Population growth, agricultural production, and commercial and residential development all require water use. Because stakeholders have different water needs and different opinions about how water resources should be used and maintained, challenges and disagreements have occurred. Understanding these complex issues and knowing the

right questions to ask when discussing water issues is an important step towards avoiding future conflict.

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Table 1. Summary of the Nutrient Requirement Legal Suit

Year	Action Taken
1998	The EPA tells all states to set limits by 2004 for the amount of harmful nutrients that can be allowed to enter state water.
2004	The Florida DEP and the EPA begin working together to develop a plan for Florida.
2008	A lawsuit emerges by environmentalist groups claiming the EPA has not upheld its original mandate.
2009	The EPA decides that what the Florida DEP had created so far is not sufficient; EPA and environmentalist groups settle the suit, with EPA agreeing to set numeric nutrient standards for Florida.
2010	The numeric nutrient standards for Florida are published by the EPA; a debate ensues on the cost of compliance for agricultural businesses.
2011	Florida DEP develops revised rules; the Florida legislature votes and approves them; environmental groups petition these new rules; Florida Judge Bram Canter rules the Florida DEP acted within its authority and upholds the new rules.