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Identifying the Needs of Opinion Leaders to Encourage Widespread Adoption of Water Conservation and Protection

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Abstract

Opinion leaders are persuasive in convincing others within their social networks to adopt certain opinions and behaviors. By identifying and using opinion leaders, agricultural educators may be able to leverage individuals who have influence on others' opinions, thereby speeding up the adoption of new practices. In this article, we review a statewide survey to define opinion leaders and understand their current water conservation practices. Additionally, by using the theoretical framework of the diffusion of innovations, we explored what subject matter areas opinion leaders are most interested in, and where they go for more information. These findings will identify how agricultural educators can reach opinion leaders to help disseminate important water conservation information. The findings indicated opinion leaders have a good grasp on how to conserve water, but are still misusing water in terms of protecting its quality. Based on these findings it is suggested that agricultural educators develop educational programming focused on improving opinion leaders' knowledge of water pollution; a connection needs to be made between water quality and the environment.

Keywords: opinion leaders, water conservation, water quality, extension, public opinion

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Introduction

Florida's relationship with water has been historically complex. From early efforts to drain swamplands, to modern efforts to restore and conserve the natural environment, water defines the state (Baker & Behn, 2013). Over the years, residents have managed to drain, ditch, and divert so much water that there is not enough left in the ground for population growth, especially during times of drought (Barnett, 2007). Growth projections for Florida predict that over the next 30 years, demand for water in Florida will increase significantly due to a growing population (Sullivan, 2014). Groundwater over-pumping has led to emergencies in every region; South Florida suffers from saltwater intrusion, Central Florida is home to sinkholes and dried-up wells, and North Florida experiences bone-dry lakes (Barnett, 2007). The state has many water conservation initiatives in place, but there is still much that can be done to increase efficiency (Greene, 2010).

Florida has five water management districts established to manage regional water supply. Officials in four of Florida's five-water management districts report they do not have enough water to supply projected population growth past the year 2025 (Barnett, 2007). To supply water to more

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than 90 percent of the population, Florida relies on groundwater pulled up from underground aquifers. Today, Florida residents are pumping water out of their aquifers faster than the state's rainfall can refill them (Barnett, 2007). The state has concluded that additional demands for groundwater cannot be met without ecological damage to the aquifer (Overdevest & Christiansen, 2013). Repeatedly, opinion leaders in Florida's agricultural sector have identified water as the top issue of concern (Odera, Lamm, Dukes, Irani, & Carter, 2013).

Opinion leaders are unofficial leaders with the ability to influence other's decisions regarding the adoption of new products, practices, or ideas (Keller & Berry, 2003). In fact, in 1994 one opinion leader, Colonel Steve Monsees, convinced the Southwest Florida Water Management District's board members that groundwater could not last (Barnett, 2007, p.108). Monsees blamed the county government on piping groundwater south for public supply. He pleaded "…all surface water is gone. All wetlands and marshes are gone. Most wildlife has disappeared. I [feel] violated and angry because of the loss of our lakes, ponds, wetlands, and wildlife. Please restore what is lawfully and rightfully ours" (Barnett, 2007, p. 108).

Opinion leaders tend to be persuasive in convincing others within their social networks to adopt certain opinions and behaviors (Keller & Berry, 2003). They tend to distribute information to their peers by upholding social norms. By identifying and using opinion leaders, agricultural educators may be able to leverage individuals who have influence on others' opinions, thereby speeding up the adoption of new practices (Rogers, 2003).

Cialdini and Goldstein (2004) found when people are unsure of what to do they look toward others for guidance on how to act. Opinion leaders have the social power to influence potential early adopters. According to Rogers' (2003) theory of diffusion, individuals fall into one of five categories when it comes to changing behavior: innovators, early adopters, early majority adopters, late majority adopters, and laggards. Opinion leaders are often recognized as early adopters who actively seek out information to learn more about how behavioral change may influence their surroundings (Dalrymple, Shaw, & Brossard, 2013).

In this case, opinion leaders can serve as a vessel for communicating with the public about water related issues. They may be successful at persuading difficult-to-convince audiences, such as late adopters or laggards, to follow environmental policies and behaviors (Dalyrmple et al., 2013). Opinion leaders may have the ability to encourage positive behaviors within social groups, while continuing to play a key role in the diffusion process.

To better understand how opinion leaders can inform the rest of the public, it is important to study the water issues of interest of opinion leaders. Sometimes opinion leaders will use what is referred to as informal learning, which may include interpersonal interaction, but at the very least opinion leaders stay up to date, are always willing to answer questions, and treat others as equals (Wadhwa, Ford-Jones, & Lingard, 2005). Water subject matter areas and methods of learning are largely under-identified for the opinion leader population. Opinion leaders can validate water issue practices and also facilitate the widespread adoption of suitable technologies (Wyckhuys & O'neil, 2007) therefore, it is important to further explore their needs to drive the development of effective programs. This research aligns with the American Association for Agricultural Education National Research Agenda (Roberts, Harder, & Brashears, 2016) because it was designed to be used by extension educators to enhance the development of programs targeting opinion leaders interested in water issues resulting in more effective programs.

Theoretical Framework

This research was based on the Theory of Diffusion of Innovation (Rogers, 2003). The theory is a social process explaining how information about a new idea is communicated and disseminated. As part of this theory, Rogers (2003) asserted that opinion leaders are more likely to be the first to participate in behaviors that could potentially influence their social networks. The dissemination of the new behavior occurs over time and can be seen as going through five distinct stages: persuasion, decision, implementation, and confirmation (Minisha-Majanja, 2005). Potential adopters must first learn about the innovation, be persuaded of the merits of the innovation, adopt it, implement it, and confirm the decision (Minisha-Majanja, 2005). Typically, early adopters are the initial group experimenting with innovations and new ideas and are usually comprised of opinion leaders (Rogers, 2003).

Early studies identified certain individuals who paid close attention to an issue, frequently discussed the issue, and considered themselves more persuasive in convincing others to adopt the opinion as opinion leaders (Katz & Lazerfield, 1955). These behaviors helped opinion leaders not only draw attention of others to a particular issue, but also, signal how others should respond to the issue (Nisbet & Kotcher, 2009). In this research we focused on *issue-specific opinion leaders* as identified by Katz and Lazerfield (1955). These leaders are involved with a specific issue or topic, in our case Florida water conservation efforts, characterized by greater levels of media attention and specific knowledge.

Water topics itself fall largely under climate issues. Survey trends depict the American public is still largely skeptical about climate issues (Bliuc, McGarty, Thomas, Lala, Berndsen, & Misajon, 2015). In today's media world, the American public has greater access to quality information about water disparities, yet public concern remains low and citizens remain demobilized (Nisbet & Kotcher, 2009). Following Dalrymple et al.'s study (2013), we want to explore the potential role that opinion leaders play in advocating behavioral compliance among water users, beyond the influence of mass communication campaigns. We are looking at outlets that motivate opinion leaders to participate in environmental outreach activities so as to influence others (Dalrymple et al., 2013).

Dalrymple et al. (2013) looked at the role opinion leaders played in informing the public about aquatic invasive species in the Wisconsin lakes. This research focused on an opinion leader's internal efficacy (McCluskey, 2004). Individuals with high levels of self-efficacy are more motivated to seek out relevant information (Rimal, 2001) and influence behaviors. This study showed opinion leaders who have a strong sense of self-efficacy are important when encouraging behavior change (Dalrymple et al., 2013). Discovering opinion leaders interest in learning about water conservation will become even more important in increasing awareness of environmental issues and encouraging preventative behaviors.

Purpose and Objectives

The purpose of this study was to understand the types of water-conservation measures that opinion leaders show interest in and how they would like to learn about these practices. The results will help extension education develop programs that are interesting and engaging for opinion leaders. The research is guided by the following objectives:

1. Describe water issue opinion leaders within the general public in Florida.
2. Describe water conservation behaviors of opinion leaders.
3. Describe the organizations opinion leaders go to for information.

4. Identify the water issue subjects that opinion leaders are most interested in learning about.
5. Determine how opinion leaders want to receive information.

Methods

To reach the objectives of the study, an online survey was employed to residents of Florida aged 18 and older. The survey instrument included elements from several existing instruments including the Canadian water attitudes survey from the Royal Bank of Canada's Blue Water Project (Patterson, 2012), the National Water Survey Needs Assessment Program (Mahler et al., 2013), and the Government Style Questionnaire (Green-Demer, Blanchard, Pelletier, & Beland, 1994). As part of a larger study, five sections of the instrument were relevant to this research study: the identification of water issue opinion leaders, their level of engagement in water conservation practices, the organizations they would go to for more information, the subject matter areas they were most interested in learning about, and how they would like to receive that information. Results were analyzed using the Statistical Package for Social Sciences (SPSS) version 22 and Microsoft Excel.

To identify water issue opinion leaders, respondents were given six statements and asked to select where on a five-point semantic differential scale between two phrases their attitude most closely aligned. A score of one represented a low level of opinion leadership represented by phrases such as "told no one", "never", "your friends tell you about water issues", "give very little information", "not at all likely to be asked", and "not used as a source of advice." A score of five represented a higher level of opinion leadership and was characterized by phrases such as "told a number of people", "very often", "you tell your friends about issues including new developments", "give a great deal of information", "very likely to be asked", and "often used as a source of advice." Results from the individual opinion leadership items were averaged to create an overall opinion leadership index score. Reliability of the opinion leadership scale was calculated *ex post facto* and resulted in a Cronbach alpha coefficient of .88.

To identify the opinion leaders within the larger population, z-scores were run on the opinion leadership index. Respondents scoring below a negative one were assigned a one, those scoring between zero and one were assigned a two, and those scoring a one or above were assigned a three. The respondents assigned a three were considered the water issue opinion leaders. The mean score for the general public was 2.48 (SD = .96). A respondent was considered an opinion leader if they were one standard deviation above the mean. The 134 respondents that fell into this category were used for further analysis.

The responses to the water conservation behavior engagement, subject matter areas of interest and learning preferences were analyzed descriptively.

To measure water conservation habits, respondents were asked to respond to a series of statements pertaining to water conservation practices on a five-point modified Likert scale ranging from 1 = *Never*, 2 = *Almost never*, 3 = *Sometimes*, 4 = *Almost every time*, and 5 = *Every time*. Example statements included: "I turn the water off every time I brush my teeth", "I avoid watering my lawn in the summer", "I let my sprinklers run when rain is predicted in the forecast", and "I hose down my driveway."

Next, respondents were asked to identify where they went for water issue related information in an open-ended format. Respondents were asked to list the top three agencies or organizations they would approach or consult with for advice about water issues. Respondents were

then provided a list of water-related topics and asked to indicate which of the following subjects they would most like to learn about. Respondents could check all that applied.

Finally, respondents were asked their preferred methods for participation in learning about water topics. Respondents were given a list of topics they would most likely take advantage of if presented with the option. Again, respondents were allowed to check all that apply.

Prior to distribution, a panel of experts reviewed the survey instrument for face and content validity. The panel included the Associate Director of the [Center] at University of Florida, an Assistant Professor and Extension Specialist in Water Economics and Policy, the Director of Center for Public Issues and Education at University of Florida, and the Assistant Professor for the Center for Public Issues and Education at University of Florida.

As previously mentioned, the target audience included Florida's general public's residents' aged 18 or older. Qualtrics, a third party public opinion research company, distributed the survey to their database of survey participants eligible based on a set criteria ensuring they were representative of the population of interest by sending a link to the survey. A 63% response rate was obtained (N = 749) from the 1,192 contacted. In order to ensure the respondents were representative of Florida's population according to the 2010 U.S. Census, the data were weighted to balance their geographic location, age, gender, and race/ethnicity (Kalton & Flores-Cervantes, 2003). This is a common procedure in non-probability sample selections to balance for selection, exclusion, and non-participation biases (Baker et al., 2013).

To analyze the open-ended responses related to where respondents went for water issues information, the results were compiled into an Excel spreadsheet and then combined into categories including City/town/local (city of.., city, city council, mayor, city hall etc.), Water Agencies (includes water management, water department, water district), State Agencies (Government, DEP, State government, Fish and wildlife), County (County, county officials, county government), EPA (EPA, Environmental protection agency), and Non-profit groups (Water.org, Conserve Florida, Audubon, One Florida Foundation etc.). The number of responses within each category was tallied to describe where the respondents went for more information about water.

Results

Description of Water Opinion Leaders

The identified opinion leaders were more likely to be female (57.1%) compared to male (42.9%). Most, 71.3%, were Caucasian/White (Non/Hispanic). Twenty-eight percent were between the ages of 20-29. The opinion leaders reported their political affiliation to be Democrat (55.2%) and their political beliefs to be moderate (48%) and were primarily located in South Florida or the [county] Water Management District (67.8%). Additionally, 68.7 % were located in coastal counties of Florida.

Table 1

Demographics of Identified Opinion Leaders (N = 134)

	n	*%*
Sex		
Female	76	57.1
Male	57	42.9
Race		
African American	34	25.7
Asian	3	2.5
Caucasian/White (Non–Hispanic)	95	71.3
Native American	1	3.0
Other	4	3.2
Hispanic Ethnicity	43	32.1
Age		
18-19	3	1.9
20-29	37	27.9
30-39	28	20.6
40-49	26	19.5
50-59	14	10.5
60-69	15	11.3
70-79	6	4.2
80 and older	6	4.2
Political Beliefs		
Very Liberal	19	14.0
Liberal	24	18.0
Moderate	56	41.7
Conservative	24	18.1
Very Conservative	11	8.1
Political Affiliations		
Republican	23	17.2
Democrat	74	55.2
Independent	25	18.8
Non-affiliated	12	8.8
Water Management Region		
South Florida WMD	44	33.5
[County] WMD	45	34.3
Southwest Florida WMD	35	26.7
Northwest Florida WMD	6	4.5
[County] WMD	1	1.0
Geography		
Coastal	91	68.7
Inland	40	30.5

Engagement in Water Conservation Behaviors

Engagement in water conservation behaviors was identified by requesting respondents identify their level of conservation efforts with a series of ten statements on a five-point Likert-type scale. Table 2 displays their behaviors. The highest reported habits included turning off the water while brushing teeth, avoiding allowing motor oil to run down a storm drain, and avoiding flushing cooking oil down the toilet. The items with the most equal distribution were not showering for more than five minutes each time they bathe and leaving the water running in the kitchen when washing and/or **rinsing** dishes.

Table 2

Water Conservation Behaviors (N=134)

	Never or Almost Never %	Sometimes %	Almost Every time or Every time %
I turn off the water while brushing my teeth	7.2	13.5	77.5
I shower for no more than five minutes each time I bath	26.4	30.0	41.8
I avoid watering my lawn in the summer	7.3	37.1	36.7
I leave the water running in the kitchen when washing and/or rinsing dishes	49.8	25.6	22.1
I allow soapy water to run down a storm drain	68.7	7.7	14.3
I let my sprinklers run when rain is predicted in the forecast	55.6	8.1	12.0
I let my sprinklers run when it has rained or is raining	59.8	3.4	11.5
I hose down my driveway	57.3	23.2	10.3
I allow used motor oil to run down a storm drain	81.0	1.4	10.7
I flush cooking oil down the toilet	81.2	4.5	10.0

Note. Respondents were allowed to indicate if a statement did not apply, therefore percentages might not equal 100%.

Organizations Opinion Leaders Use for Information about Water

Respondents were asked an open-ended question about what organizations they would go to for more information about water issues. The most reported organizations from opinion leaders were water agencies, state agencies, non-profit/NGO groups, City/town/local organizations, or County organizations. Sixty-nine out of 134 respondents indicated they would turn to water agencies such as their local water department and their regional water management districts first. This was closely followed by 63 opinion leaders reporting they would go to state agencies such as the Department of Health, the Department of Agriculture, the Department of Environmental Health, the Fish and Wildlife Commission, and the State of Florida government for more information.

Forty-five opinion leaders reported going to non-profit groups such as Water.org, Conserve Florida, Audubon, and One Florida Foundation.

Subject Matter Areas of Interest

Respondents were asked what water subjects they would be most interested in learning more about. Results are shown in Table 3. Respondents were asked to select all that apply. Of the options presented, opinion leaders were most interested in restoring fish and aquatic habitat, home and garden landscaping ideas for Florida yards, and fish and wildlife water needs.

Table 3

Opinion Leaders' Subject Matter Areas of Interest (*N* = 134)

	%
Restoring fish and aquatic habitat	23.2
Home and garden landscaping ideas for Florida yards	22.8
Fish and wildlife water needs	22.3
Watershed restoration	20.4
Shore-line clean up	20.0
Water policy and economics	19.5
Community actions concerning water issues	16.9
Fertilizer and pesticide management	16.0
Watershed management	15.5
Forest management and water issue	14.1
Irrigation management	12.3
Landscape buffers	12.2
Private well protection	11.6
Septic system management	6.9
Other	0.6

Additionally, respondents were asked how they would like to learn about water issues. The results are displayed in Table 4. Overall, opinion leaders would like to learn through visiting a web-site, watching TV coverage or a video, or reading printed fact sheets, bulletins, or brochures.

Table 4

Opinion Leaders Preferred Modes of Learning (*N* = 134)

	Opinion Leaders %
Visit a web-site	40.0
Watch TV coverage	34.5
Read printed fact sheets, bulletins, or brochures	24.9
Watch a video	24.9
Attend a fair or festival	22.4
Read a newspaper article or series	21.0
Take part in a one-time volunteer activity	15.3
Attend a short course or workshop	11.4
Get trained for a regular volunteer position	11.4
Look at a demonstration or display	11.9
Attend a seminar or conference	9.2

Conclusions, Implications and Recommendations

The results revealed self-reported water issues opinion leaders are predominately Caucasian and women. The largest age group identified within the opinion leaders were respondents aged 18 – 29, identified as a Democrat with moderate political beliefs. Additionally, opinion leaders were predominately from coastal communities and were a part of either the [County] or South Florida Water Management Districts.

Although self-designated survey scales are perhaps the least expensive and the easiest way for organizations to identify opinion leaders, the primary limitation is that respondents may overestimate or underestimate the actual degree of influence they have in their communication network (Nisbet & Kotcher, 2009). This being acknowledged, it is interesting to note many of the opinion leaders were younger compared to more seasoned residents. Previous research has shown younger individuals tend to be risk takers and more innovative in nature (Rogers, 2013) and therefore may be more engaged with taking action. Additionally, the majority came from east coast and southern coastal communities.

A downside to the majority of the opinion leaders being younger is that a younger audience is not turning to extension for information on water. This is significant to the industry. This information should encourage extension to design water-focused programming that can be marketed towards a younger audience. There are several recommendations suggested to help mitigate this issue.

It is proposed the reason opinion leaders represent a younger generation is that water conservation has become more of a pressing issue in the past decades than it was previously (Baker & Behn, 2013; Barnett, 2007). This might imply that the younger generation has more access to

mass media outlets such as social media or online news sources, which enables higher levels of opinion leadership compared to previous generations. As extension programs are developed around water issues, this should be kept at the forefront of planning to encourage the use of social media such as Facebook, Twitter, Instagram, etc., as a sharing platform.

Overall, the majority of opinion leaders engaged in water conservation behaviors by turning off the water every time they brush their teeth, not using sprinklers in advance of rain or after it has rained, and turning off the water when rinsing dishes and taking shorter showers. These results reveal that opinion leaders are cognizant of when they should be saving water. However, in terms of water quality conservation practices, the responses were different. While the majority responded positively to water conservation efforts, there is a portion still practicing wasteful water habits such as hosing down a driveway, allowing soapy water to fall down a storm drain, allowing used motor oil to fall down a storm drain, and flushing cooking oil down a toilet. This implies that even opinion leaders need continued exposure to understand why these particular habits are bad for the environment and should be addressed. Extension agents putting together water-focused programs should integrate educational experiences that stress the importance of protecting water resources in terms of water quality as well as conservation for water quantity.

As far as organizations available for more information, majority of respondents reported water management districts, state agencies and non-profit agencies as their top choices. The results revealed that opinion leaders are reaching out to non-profit groups over the Environmental Protection Agency or local city or county organizations. It can be concluded that opinion leaders are more knowledgeable of water issues and therefore know of different organizations besides public offices. Even more significant was the complete lack of mentioning the Land Grant University within the state as a resource, or the Cooperative Extension Service more specifically. This implies that Cooperative Extension has some work to do if they want to be a go to resource for those having the most influence within their communities when it comes to water issues. This finding shows that opinion leaders, those most active in disseminating water-related information, are not using extension agents as a resource. Readily addressing this gap is highly encouraged through further research identifying opinion leaders' needs in this area and encouraging their use of extension materials.

Subject matter areas of particular interest to opinion leaders were restoring fish and aquatic habitats and fish and wildlife needs. The opinion leaders being predominantly from coastal communities may have played a role in this response and area of interest. This is a perfect example of the critical importance of protecting water resources in terms of water quality and water quantity. Extension agents have a role to play in educating this audience about how both efforts can have a positive effect on fish and wildlife habitat protection.

To learn more about these subject matter areas, opinion leaders would prefer to visit a web-site, watch TV coverage or a video, or read printed fact sheets bulletins or brochures. Traditionally, extension agents have focused on developing face-to-face interventions and educational opportunities, offering volunteer programs, and encouraging participation in workshops. Perhaps the development of short videos offered through an online medium that could catch the attention of opinion leaders in coast communities would be more effective. They would also be a medium easily shared by the younger generation through social media. Research examining the use of online resources and the amount of sharing that occurs as a result could further elucidate the time and effort it takes to create these materials. It is possible, that after engaging opinion leaders with informal learning techniques such as a website or video that face-to-face meetings could be set up to further interact with opinion leaders.

In order for any of the proposed actions to be successful, extension agents much motivate opinion leaders to promote the adoption of water conservation practices. Opinion leaders' attitudes will impact the adoption of innovation. Additionally, extension agents must continue to work with opinion leaders to better understand how they are convincing others to adopt water conservation practices. As opinion leaders will be drawing attention to others of the issue at hand, it will be helpful to work with them to understand and establish goals of how to disseminate the information.

Water issues are not only rampant in Florida, but across the nation and are a nationwide priority for extension agents to address. This research identified water issues opinion leaders within Florida but additional studies could examine if individuals within other states have the same characteristics and needs. Perhaps a national extension campaign could be created targeting this important audience should trends emerge. Additionally, the use of opinion leaders in spreading extension information has been limited. This research revealed water issues opinion leaders are not using extension resources and do not identify the Cooperative Extension Service as a place to go for information. Future research could explore why opinion leaders do not identify it as a source of information to assist in overcoming this issue.

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