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Water conservation behaviors in Georgia the effects of place

Amber Kay Scott
University of Tennessee

To the Graduate Council:

I am submitting herewith a thesis written by Amber Kay Scott entitled "Water conservation behaviors in Georgia the effects of place." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Sociology.

Stephanie Bohon, Major Professor

We have read this thesis and recommend its acceptance:

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Lois Presser

Sherry Cable

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WATER CONSERVATION BEHAVIORS IN GEORGIA: THE EFFECTS OF PLACE

A Thesis
Presented for the
Master of Arts
Degree
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Amber Kay Scott
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ABSTRACT

This piece is an examination of water conservation responses to the 2007 Georgia drought. The research questions for the study are: (1) Are those living in close proximity to the harshest drought conditions more likely to engage in water conservation behaviors than those not in close proximity to the conditions? (2) Are those living in close proximity to the harshest drought conditions more likely to report a greater likelihood of engaging in water conservation behaviors in the future? In other words, it is a question of actual versus intended behaviors. The data for the study come from the 2007 Peach State Poll, a telephone survey of 800 adult Georgia residents, administered from November 19 to December 2, 2007. The respondents were asked if they were very likely, somewhat likely, not at all likely, or already are engaging in one of seven water conservation behaviors. To analyze the data, I used negative binomial regression and ordinary least squares or OLS regression. I found that those who reside in the exceptional, extreme, or severe drought area were engaging in significantly more water conservation behaviors than those not residing in those areas. I also found that there is no effect of place on intended engagement in water conservation behaviors, suggesting that context and crisis has much to do with response. Furthermore, I found that certain demographic factors mediate the effects of place. Specifically, people who are older, female, white, have a modest income, and have a substantial income are likely to engage in water conservation behaviors.

TABLE OF CONTENTS

Water Conservation Behaviors in Georgia: The Effects of Place

CHAPTER I

Introduction

The conservation of natural resources has been studied in various ways. There have been studies focusing on the ways in which natural resources can be conserved, the reasons or motivations that people have to conserve natural resources, and the advantages of engaging in natural resource conservation. As the reality sets in that natural resources are finite, the need to act through conservation is imperative. People possess different reasons for conserving natural resources, such as water. Some of the reasons may be to save money on utilities (Environmental Protection Agency 2006), possible mandates on conservation behaviors (Moore 1991), or attitudes and level of environmental concern (Van Liere et al. 1980, Dietz et al. 1998, Routhe et al. 2005). Environmental concern motivates people to act, especially when confronted with environmental problems, such as drought, in a direct manner—the factor of context and crisis. Being faced with an environmental problem like drought increase one's level of environmental concern through awareness, and thus, works as a driving force of change by engagement in water conservation behaviors.

Setting

Water is the essential basis for human maintenance and existence. According to the Environmental Protection Agency (2008), water is not only imperative to the functioning of life, it is also important to ensure the functioning of the entire ecosystem. Furthermore, according to the United Nations Water Thematic Initiatives (2006), not only is water essential for a properly

functioning ecosystem, water is the basis of all socioeconomic development. Unfortunately, pressures such as population growth, mass development, and profligate use of water are threatening the supply of available water (United Nations—Water Thematic Initiatives 2006). Climate change is an additional pressure that is also threatening the water supply (Hurd et al., 1999). All of these elements work together to exacerbate the issue of water shortage.

In the United States, water shortages are a common concern in Western states like California, Nevada, and Idaho. However, water crises are also now occurring in Southern states, such as Georgia, that typically have an abundant water supply. In 2007, Georgia experienced a severe drought, and currently, Georgia continues to experience harsh—but less severe—drought conditions that are depleting water access for many of its residents (Skoloff 2007). For the purposes of my study, drought is defined as a condition of the environment where water is less available than it would be normally. Specifically, it is a prolonged time period where there is insufficient precipitation that affects most aspects of society and the environment (The National Drought Mitigation Center 2006), and the 2007 Georgia drought did just that by affecting agribusiness and personal lives.

Georgia farmers reported having a difficult time feeding their cattle in 2007 because the drought dried out hay pastures. As of May 2007, the drought had harmed more than three-fourths of pasture land in the state, which caused a decline in hay production. According to the Georgia Agricultural Statistics Service, in most places in the state, 70 to 80 percent of pastures were in poor or very poor condition, and in south-central Georgia, 90 percent of pasture land fell into these categories (Haire 2007b). In October 2007, there were many reports about decreasing feed for cattle, and it was becoming clear that there would be insufficient cattle food supply for the winter. In the summer, hay is usually baled for winter food. In normal summer weather, up

to two million tons of hay can be stored away for winter food supply. However, in the summer of 2007, which was characterized by very harsh drought conditions, only 600,000 to one million tons of hay were stored. This amount was only enough feed for Georgia's cattle for 60 to 100 days (Haire 2007a).

Crops in Georgia also suffered from the drought conditions. Peanut and cotton planting—some of the most important agricultural crops in Georgia—was delayed as a result of the drought. As of May 2007, in most of the fields, 66 percent of the soil was shown to be "very short in moisture" (Haire 2007c). This percentage increased to 70 to 90 percent in the central and southern parts of the state. In a typical May, only about 7 percent of the soil is categorized as "very short in moisture." Peanut planting is normally completed in May. However, only 33 percent of the crop had been planted by May 2007. Delayed planting leads to delayed harvest, which translates to lower overall crop yield. Low yield is exacerbated by the fact that the peanuts that are planted will not grow without proper moisture. This is also true of cotton. In May 2007, only 40 percent of the cotton planting had occurred rather than the two-thirds that is typical (Haire 2007).

Water levels of Georgia's various bodies of water also declined rapidly. Lake Lanier, which is Georgia's main source of drinking water, drained to its lowest levels ever. By the summer of 2007, the water level had dropped more than 10 feet, exposing islands and causing thousands of people in the area to enter a state of panic (Strassmann 2007). According to Strassmann (2007), it was feared that in the absence of rainfall, there was a real possibility that Lake Lanier's drinkable water would run out by the end of the year. The crisis prompted people to plan for other ways of obtaining water, such as digging private wells.

Although drought is a biological problem, it is important to emphasize that it is a social problem, as well. It is clear that human behaviors and pressures such as wasting water resources, wide-spread development, and massive population growth are both causing the water shortages and exacerbating shortages that result from insufficient rainfall. A problem such as this has been referred to as a "crisis of maladaptive behavior" (Maloney et al. 1973: 583), or crises caused by environmentally harmful human behaviors. Awareness of such human causes of drought came in the late 1960s, at which time the existing conservation movement of the United States began to change. During this time, it was becoming "evident that ecosystems and natural resources that serve as humankind's life-support systems are being jeopardized by depletion of natural resources, pollution, and overpopulation" (Dwyer et al. 1993: 276).

Clearly, resource scarcity is caused by human behaviors (Hardin 1968). In the case of the 2007 Georgia drought—the topic of this research—the residents and leaders engaged in behaviors leading up to the water scarcity crisis that did not take into account the fact that water resources are finite, and that they must be used carefully. Policy makers and planners encouraged but did not sufficiently plan for the rapid population growth of the state that occurred just prior to the drought. Instead, they allowed rapid development, particularly in the Atlanta metropolitan area—the area worst hit by the 2007 drought. Climate change, wasteful human behaviors, and poor planning for the use of water resources in Georgia both created the drought and exacerbated the negative effects of it (Grunwald 2007, Royer 2007).

Because the 2007 drought was largely the result of human behavior, human behavior change was, and continues to be, necessary for its amelioration. My research examines responses to the 2007 Georgia drought, comparing water conservation behaviors and intended conservation behaviors as a function of place. In this study, water conservation behaviors are

conceptualized as consciously acting in such a way as to reduce water use that leads to the conservation of water resources. Conscious actions, such as washing cars or flushing toilets less frequently and fixing leaking faucets, can be taken around the house and outdoors to conserve the water supply (Water Systems Council 2007). Intended water conservation behaviors are reported likelihoods of engaging in conservation behaviors in the future. I examine how Georgia residents responded to the drought through conservation behaviors, their reported likelihood of changing behaviors in the future, and whether these behaviors occurred more in the areas that are experiencing the most drought or if the conservation occurred statewide.

Purpose

The purpose of this study is to examine both actual and intended water conservation behaviors reported by Georgia residents at the time of the 2007 drought. I am particularly interested in determining if living within the state's harshest drought areas affects the likelihood of engaging in water conservation behaviors and in intending future behavior change, and if these reported levels of actual and intended behavior are lower in less extreme drought areas in the state. Toward that end, my study examines the impact of crisis and context on responsive behaviors. This is the question of whether or not being face-to-face with the effects of drought and with policy interventions, in the middle of the crisis, makes one likely to engage in more water conservation behaviors. During a crisis, such as drought, people's responses may be different than they would be if they were living elsewhere, not witnessing the immediate effects of drought. An example of this is the incident at Cuyahoga River in Cleveland, Ohio in 1969. The river caught fire as a result of an oil slick and debris in the river. This incident brought attention to environmental problems not only in the state of Ohio but all over the United States, as well. The river had become polluted from years of having no controls on pollution mixed

with mass manufacturing. Although the problem of water pollution in the river had been ongoing for several decades, it took visual images of the river burning to produce responses. Fortunately, there were positive outcomes from the crisis. The burning provided impetus for the beginning of the Environmental Movement and the creation of the Clean Water Act of 1972 (Ohio History Central 2005). People were put face-to-face with the image of the burning river and reacted by making a change. I speculate that little action would have been taken if the people had not physically seen the negative effects of pollution. Extending this example to Georgia, I expect that when facing a serious drought and seeing its visible affects in browning lawns and lowering lake levels, people are more likely to change their behavior than when water shortage is seen as a far-off and potentially future problem. If I am correct, then we should expect to see the greatest behavior changes among people who live in the most extreme drought areas of Georgia, but we should not expect to see differences in *intended* behavior changes across residents of different drought severity areas.

Put more succinctly, this research will address two questions: (1) Are those living in a close proximity to the harshest drought conditions more likely to engage in water conservation behaviors than those not in close proximity to the conditions? (2) Are those living in close proximity to the harshest drought conditions more likely to report a greater likelihood of engaging in water conservation behaviors in the future than those not in close proximity to the conditions?

Studies have been conducted on issues of drought and water conservation behaviors (Karl 1983, Pavey 2007, Postel 1998, Stern 2000), but no study that I am aware of compares water conservation responses to scarcity across places with varying degrees of drought severity. This study is important because it has much to offer in the area of social behavior, and the ways in

which experience and concern motivates humans to take action. In the following section, I will discuss sociologists' and other disciplines' current knowledge of drought, responses to resource scarcity, and water conservation behaviors.

This piece is divided into five chapters. The first chapter, as was seen, is the introduction, where the context of the work is set, and the purpose is put forth. The second chapter is the background, where a review of the existing literature on environmental concern is conducted, and research on drought, responses to resource scarcity, and water conservation behavior is put forth. The third chapter is data and methods, where the source of data and the methods of analysis for the study are explained. The fourth chapter is the results of the study, where the outcome of the quantitative methods is explained. The fifth chapter is the conclusions of the study, where there is a further explanation of the results

CHAPTER II

Background

There have been many studies conducted on correlates of environmental concern. I will begin the review of the literature with a summary of an article by Van Liere and Dunlap (1980) and continue with a chronological review of other articles dealing with correlates of environmental concern.

Review of Correlate Studies

Van Liere and Dunlap (1980) engaged in an evaluation of present and past knowledge concerning the social bases of environmental concern, looking at correlates of environmental concern. Van Liere and Dunlap tested the relationship between eight demographic variables (age, sex, income, education, occupational prestige, residence, political party, and political ideology) and environmental concern. They also conducted a review of five hypotheses: *The Age Hypothesis*, *The Social Class Hypothesis*, *The Residence Hypothesis*, *The Political Hypothesis*, and *The Sex Hypothesis*. *The Age Hypothesis* states that younger people are more environmentally concerned than older people. This hypothesis rests on the idea that since younger people are less integrated into the social order, they are more likely to embrace change or environmental reform. *The Social Class Hypothesis* posits that there is a positive relationship between social class (i.e., education, income, and occupational prestige) and environmental concern. Since their basic needs are met (Maslow 1975), they are able to focus more on environmental quality. *The Residence Hypothesis* states that urban residents are more likely than rural residents to be environmentally concerned—this hypothesis rests on the idea of proximity of residence to environmentally degraded areas and one's relationship to the natural environment

(rural residents needing to engage in extractive actions to survive). *The Political Hypothesis* (political party and political ideology) posits that democrats and liberals are more concerned with the environment than republicans and conservatives—this hypothesis rests on the idea that any type of environmental reform is opposed by business and industry, as a result of costs; environmental reform would mean stronger governmental involvement and regulation; and environmental reform would require innovative action and change. Each of these necessary steps to reform is thought to be opposed by republicans and conservatives. *The Sex Hypothesis* is left out somewhat, since at that time, little attention was paid to the relationship between sex and environmental concern.

The outcomes of Van Liere and Dunlap's study displayed mixed support for the five hypotheses. *The Age Hypothesis* was supported by the study, in that there was a negative relationship between age and environmental concern. In regards to *The Social Class Hypothesis*, there was a positive relationship between education and environmental concern. However, the study failed to support the hypothesis of the positive relationship between income and environmental concern and the positive relationship between occupational prestige and environmental concern. Overall, there is very little support for *The Social Class Hypothesis*, in its entirety. Their study indicated mixed results regarding support for *The Residence Hypothesis*. Results of *The Political Hypothesis* reveal that party affiliation is not an important variable in explaining environmental concern among the masses. However, there is strong support for those with a liberal ideology being more concerned with the environment than those with a conservative ideology. Results of *The Sex Hypothesis* were inconclusive, since it was based on limited evidence. Van Liere and Dunlap (1980) concluded that age, education, and political ideology are the most significant correlates of environmental concern. Put differently, those that

are younger, well-educated, and politically liberal are more concerned with the environment than older, less educated, and politically conservative persons. However, they also concluded that the correlates had modest success in explaining environmental concern.

Political Ideology, Education, and Age

Samdahl and Robertson (1989) engaged in a review of earlier research on relationships between various sociodemographic variables and environmental concern. They recognized that past research concluded that those who display environmental concern have a tendency to be young, well-educated, and more likely to be urban. However, Samdahl and Robertson (1989) contributed more to the literature. The results of their study revealed that the political ideology of pro-regulatory liberalism was positively related to environmental concern. Furthermore, their study displayed no relationship between education and concern for the environment, while the results also showed that there was a "negative effect of education on perceptions of environmental problems and support for environmental regulations" (Samdahl et al. 1989: 76), which is unlike findings from previous studies. Lastly, they found a positive relationship between age and environmental concern, which was also contrary to previous research.

Gender

Schahn and Holzer (1990) conducted a study that emphasized the importance of individual environmental concern and engaging in pro-environmental behavior. The results of their study hold implications for the sex correlate of environmental concern. The results showed that females display more environmental concern, especially in areas that relate to household behavior. However, males showed more overall knowledge of environmental problems.

Other Correlates--Race

Taylor (1989) made a contribution to a different correlate of environmental concern, not

covered by Van Liere and Dunlap (1980) or Samdahl and Robertson (1989), that of race. Taylor (1989) focuses on the environmental concern gap between blacks and whites—stating that there is a need to focus more on the gap between concern and action. Taylor (1989) postulated that the reasons for lack of African American concern for the environment can be placed into three categories: social psychological (i.e., socio-economic status, marginality, hierarchy of needs, relative deprivation, and general concern for social problems); cultural (i.e., mythology, slavery, ethnicity, segregation, access, civil rights, and compensation); and measurement error (i.e., inappropriate indicators and sampling). Taylor (1989) concludes that there is a mixture of social, economical, psychological, cultural, historical, and measurement factors that lead to the concern gap between blacks and whites—in turn, leading to an action gap, as well.

Jones and Carter (1994) conducted a study on race as a correlate of environmental concern. The results of the study indicated that although there are differences among African Americans and white Americans in involvement in environmental organizations, African Americans show strong environmental concern the same as, and at times, more than that displayed by white Americans. The outcome of their study was varied from results of past studies of race as a correlate of concern with the environment.

Jones and Rainey (2006) engaged in a study that showed that blacks are more concerned than whites about local environmental problems and negative environmental quality, and blacks also showed to be more worried about the seriousness of the problems. Moreover, the "study suggests that the government, not Blacks, cares less about the environmental problems in Black communities (Jones et al. 2006: 492).

Although the literature provides a plethora of findings and correlates of environmental concern, my contribution is to fill the gap of context and crisis. Specifically, my study demonstrates that direct exposure to environmental crisis is another correlate of environmental concern, and thus, pro-environmental behavior.

Biological Factors

Drought exists as water shortages. Much of the work on water shortages examines how water resources have been affected by climate change (Intergovernmental Panel on Climate Change [IPCC] 1996, Jackson et al. 2001, Loaiciga et al. 1996). Such studies on the effects of climate change have concluded that as greenhouse gases buildup in the atmosphere, the earth will continue to warm, and extreme hydrologic effects such as floods and droughts are likely to become more frequent and more severe. Environmental scientists have found that drought affects forests and the plants and species within them, by either sharply reducing their net primary production and water use or affecting them by making them die off. These outcomes are a result of a reduction in soil moisture and conduciveness of the stomata (Dale et al. 2001, Hansen et al. 2001, Hanson et al. 2000, He et al. 1999).

Most studies conducted on drought and its climate change origins in the United States, however, focus on the Western United States where water scarcity is a perpetual problem. The studies conclude that climate change has a negative effect on water resources (Barnett et al. 2004, Christensen et al. 2004, Dettinger et al. 2004, National Assessment Report 2000, Payne et al. 2004). The studies deal with compromised water resources in the Western United States (i.e. the Colorado River Basin; Merced, Carson, and American River Basins, Sierra Nevada, California; Columbia River Basin). By focusing on Georgia, my work will help to expand the regional scope of drought research and conditions of water scarcity from drought. The work in

environmental sociology on drought and water scarcity is often focused on conflict and competition for scarce water resources (Donahue et al. 1997, Harris 2002, Homer-Dixon 1999). This research foretells a potentially negative outcome for Georgia and other places if the drought persists. Much of the research concludes that competition for scarce water resources is viewed as a national security issue (Allenby 2000, Gleick 1993, Postel et al. 1996).

Responses to Resource Scarcity

Droughts are one aspect of resource scarcity. Resource scarcity is the shortage of renewable resources such as water (as examined here), land to grow food, and forests (Homer-Dixon 1999). Resource scarcity is also defined by the idea that it will persist into the future if nothing changes (Tisdell 1990). Resource scarcity exists as a result of human pressures on the environment, leading to depletion and degradation of natural resources. One must take note that resource depletion and degradation depend on the vulnerability of the resources at stake, the size of the population that is consuming the resources, and the practices, both technological and human, that the population utilizes to consume the resources (Homer-Dixon 1999). However, causes of resource scarcity are not limited to depletion and degradation. Although depletion and degradation are credited with reducing the supply of a resource, the occurrences of population growth and altered consumption behavior lead to even more resource scarcity by increasing the demand for it (Homer-Dixon 1999). An additional considered cause is unequal distribution of resources, where one group or a small number of groups has access to an abundance of resources, while another group is deprived of the amount of resources necessary to sustain it (Homer-Dixon 1999). Therefore, this unbalanced distribution of resources results in scarcity to certain groups in society. In Georgia, where more than four million of the state's eight million people live in the Atlanta metropolitan area and a preponderance of the rest of the state's

population lives in North Georgia, drought caused by improper water use in this region can affect the rest of the population living in rural areas of South Georgia. In 2007, the drought—the result of lower than average rainfall—was most severe in north Georgia, but it was exacerbated by the heavy water demands placed by the relatively larger population in the most hard-hit drought area. My work explores this dimension of unbalanced distribution by examining whether or not north Georgia residents—who were both in the epicenter of the drought area and, arguably, some of the causes of the water shortage—were engaging in more water conservation behaviors than south Georgia residents.

As resources, like water, become depleted, there are various responses that may occur. One possible response is conflict over natural resources. According to Homer-Dixon (1999), environmental scarcity brings about certain social effects, which then has the potential to lead to conflict among people. The conflict arises from competition over resources that are in low supply; these resources are essential to the life of all humans. A specific instance of this competition is the emerging and ongoing "water wars" in the Southeastern United States between Georgia and other states in the region, primarily prompted by the 2007 drought. One such case concerns Georgia, Alabama, and Florida's competition for water from the draining Lake Lanier. The dispute is no surprise, considering that the waters of Lake Lanier, which are driven through federal dams along the Chattahoochee River, provide for approximately 2.8 million people occupying the metropolitan area of Atlanta, a nuclear power plant in Alabama that is responsible for lighting much of the state, and Florida's marine life in the Apalachicola River and Bay area (Whoriskey 2007). Due to the drought, the people of these three states are fighting for their rights to the remaining water supply. The dispute is complicated by the fact that Lake Lanier—like all Georgia lakes—is manmade. The lake was created by the Army Corp

of Engineers specifically for all three purposes stated above, so it is difficult for any one state to argue that they are taking advantage of another state's naturally occurring resources.

Much of the water shortage in Lake Lanier has been blamed on pressures caused by the Atlanta metropolitan area's growth and the failure of its leaders to plan for or limit such growth (Whoriskey 2007). Water wars are also raging between Georgia and Tennessee. Since Georgia experienced such harsh drought conditions in 2007, the state now wants access to the waters of the Tennessee River. The Georgia leaders want to move the boundary line between Georgia and Tennessee northward by just over one mile along a line just west of Lookout Mountain, Tennessee, which is north of Lookout Mountain, Georgia. This land attainment would be granting access of the Tennessee River to the state of Georgia (Jonsson 2008). The Southeastern United States has had little previous experience with drought, but the existence of water wars on two fronts suggests that attempts to take resources from other states and to give primacy to one state's water needs over another has been one of the first approaches pursued by the state of Georgia. To my knowledge, no attempts were made to curb Georgia's rampant growth either before the drought, when nearly two million people entered the state in a ten-year period (US Census Bureau 2000), or during the drought period, although water use has likely been a contributing factor to the water shortage. Georgia's governor and other policy makers did, however, encourage water reduction at the household level both through public exhortations to curb water waste and through temporary bans on some types of water use. It is the effectiveness of these micro-level changes with which I concern myself in this research.

Examining resource conservation behavior at the individual level is important, since a typical response to resource scarcity, in general, is to take action to change behaviors in the use of resources. The research on resource scarcity indicates that the decision to engage in pro-

environmental behaviors can be explained by viewing one's beliefs or attitudes, personal control, and/or desire to get particular results as a guide to behavior (Axelrod et al. 1993). From this, it can be taken that people often rationalize their way to behaviors that are environmentally or resource responsible. Given that Georgia's Governor, Sonny Perdue, and other prominent state leaders were vociferous in their demands for curbing water use—for example, the need for water conservation has been featured prominently in Perdue's last several state of the state addresses—I wondered how effective these policy makers had been in getting Georgia's citizens to change their attitudes, and, hence, their actual and intended water use behaviors (Governor Sonny Perdue 2008).

Water Conservation Behaviors

The literature concerning water conservation behaviors is broad. A consensus exists among scholars that water conservation is an effective response to curbing the effects of drought (Gleick 2002, Vickers 2001). The authors of these works conclude that although there are currently many technologies that can be used to curb these effects, it is imperative to remember that resources are finite, and there is a need to conserve the water resources.

The theoretical framework of this study is centered on the environmental concern literature. Before delving into the way environmental concern applies to this study, it is important to define environmental concern. One definition is that "environmental concern refers to the degree to which people are aware of problems regarding the environment and support efforts to solve them and/or indicate a willingness to contribute personally to their solution" (Dunlap et al. 2002: 485). The existing literature on environmental concern shows that there are certain demographic factors that influence environmental concern and engagement in environmental behaviors. Specifically, women have shown environmental concern and more

engagement in environmental behaviors than men, especially when such behaviors are done in the household (Schahn et al. 1990). The literature also indicates that non-whites are less environmentally concerned and less likely to engage in pro-environmental behaviors than whites (Taylor 1989), older people are more likely than younger people to express their concern for the environment through pro-environmental behaviors, and extremely poor people show less environmental concern and engage in less environmental behaviors (Maslow 1975).

In regards to this study, the environmental component of environmental concern would be the drought, and the concern component would refer to the manner in which people responded to drought, in this case, responding with water conservation behaviors. The level of one's environmental concern is linked to engagement in environmental behaviors. The concern component of environmental concern is most relevant to this study. The existing literature posits two approaches to conceptualizing concern: the policy approach and the theoretical approach. For the purposes of this study, the policy approach is well-suited. The policy approach focuses on the understanding of environmental issues, finding solutions to the issues, and the implications for policy. Through this approach, measurements of environmental concern are used as:

> perceptions of the seriousness of environmental problems; opinions about the major causes of such problems and who (industry, government, or individuals) should have primary responsibility for solving them; preferred solutions to such problems; individual support for various solutions, such as increased government regulations on industry to willingness to pay higher taxes and/or prices; and self-reports of pro-environmental behaviors, ranging from consumer behaviors to political actions (Dunlap et al. 2002: 489).

The purpose of the study is to reveal if living in close proximity to the drought affects the engagement in water conservation behaviors and the likelihood of engaging in such behaviors in

the future. As such, this study draws upon the environmental concern literature, and especially its policy-relevant approach, in developing models to answer my research questions.

According to the environmental concern literature, human behavior is impacted by their concern for what is occurring in their surroundings or context. Therefore, when one is living in close proximity to the environmental crisis of drought, their level of environmental concern is elevated because the effects of the drought are clear, and this peaked concern drives them to engage in water conservation behaviors. They do so in an attempt to curb the negative direct impact on their immediate surroundings. Environmental context, environmental crisis, and environmental concern work together to bring about engagement in water conservation behaviors.

CHAPTER III

Data and Methods

Data for this study are taken from the 2007 Peach State Poll (see Appendix A). Along with this figure, all other figures and tables are included in the appendix. The poll is a telephone survey of 800 adult Georgia residents carried out between November 19 and December 2, 2007 (Carl Vinson Institute of Government 2007). I conducted statistical analyses of these data to examine the relationship between the conservation behaviors and place of residence within Georgia. The water conservation behavior variable and intended water conservation behavior variable are measured in the survey by the respondents' reported engagement and likelihood of future engagement in a variety of water saving measures. Specifically, the respondents were asked what they are doing to conserve water (i.e. if they are very likely, somewhat likely, not at all likely, or already are engaging) in one of seven behaviors: (1) taking shorter showers, (2) using faucets less, (3) watering lawn and garden less, (4) washing only full loads of laundry and dishes, (5) washing car less frequently, (6) checking for leaks, and (7) flushing toilets less often. The dependent variable that measures water conservation behavior is *count data*, and it measures the number of behaviors that respondents report that they already engage in. The dependent variable that measures intended water conservation behaviors is a standardized scale of reported likelihood of engaging in each of the seven reported behaviors. This scale has an alpha reliability of 0.75.

The variable of interest is the drought conditions at the respondent's residence. Appendix B shows the state drought map, showing the counties of Georgia and their drought levels (Rippey 2007). Placing each county into their most severe category, I created four

categories of residence. The categories represent living in exceptional drought conditions, extreme or severe drought conditions, moderate drought or abnormally dry conditions, and not experiencing drought conditions. Living in a county not experiencing drought conditions is the reference category.

There are seven control variables used in this study. The first control variable deals with how concerned the respondents are about drought conditions in Georgia. Concern is important to control for, because one's concern influences behaviors. It turns out that only 5.9% of the respondents were unconcerned about the drought conditions. As a consequence, drought concern is measured as a dichotomous variable with 1=very concerned and 2=not very concerned or not at all concerned. The second control variable is age, which is coded into ordinal categories (1=18-25 years, 2=26-35 years, 3=36-45 years, 4=46-55 years, 5=56-65 years, and 6=66 and older) and will be treated continuously. Age is controlled for the purpose of being able to discriminate between their respective engagements in water conservation behaviors. The third control variable is gender, coded as 0=female and 1=male. In order to see the differences between women and men in their engagement in conservation behaviors, gender is selected as a control variable. The fourth control variable is self-reported race, and it is coded as 0=non-Latino white and 1=non white (including Latinos/Hispanics). Self-reported race is controlled for the purpose of studying the differences between whites and non-whites in behavioral engagement. The fifth control variable is educational attainment, which is separated into four categories: (1) high school diploma or less (selected as the reference category), (2) some college, but no 4-year degree (3) 4-year college degree, and (4) post graduate work. Education attainment is selected as a control variable in order to see the variations in behaviors among those with different levels of education. The sixth control variable is whether or not the

respondents own their home, and it is coded as 0=owns home and 1=does not own home. Home ownership is controlled for the purpose of revealing if there are behavioral differences between those who own their home and those who do not. The seventh control variable is household income, which is separated into five categories: (1) less than $30,000 (selected as the reference category), (2) $30,000 to less than $50,000, (3) $50,000 to less than $75,000, (4) $75,000 to less than $100,000, and (5) $100,000 or more. Household income is controlled for the purpose of studying the differences in engagement in water conservation behaviors among those with varying incomes. These variables should be controlled for, since they can impact the results of the analysis.

My study involves quantitative methods, namely, the use of negative binomial regression and OLS (Ordinary Least Squares) regression analysis. Several statisticians promote the use of negative binomial regression under certain data conditions (Beck et al. 1995, White et al. 1996, Byers et al. 2003). White and his colleagues are particularly adamant about the advantages of using negative binomial regression for analyzing frequency count data when models do not exhibit a Poisson distribution (which is the case with my behavioral models, indicated by tests not shown). Because my variable measuring intended behavior change is continuous, I will utilize OLS regression for those models. Two models are tested for each of my dependent variables, using the appropriate method. The reduced models examine the dependent variables (separately) associated with characteristics of the variable of interest (severity of drought conditions). The full models include all of the control variables.

CHAPTER IV

Results

After conducting negative binomial regression analysis on the data, the results showed that place did have an effect on engagement in water conservation behaviors. The results of the OLS regression indicated that place had no impact on the intent to engage in such behaviors. However, both of the methods' results showed that certain demographic factors mediate the impact of place, when it comes to engagement in water conservation behaviors. Model 1 of each method is the reduced model, involving only the dependent variables and the variable of interest. Model 2 of each method is the full model, including the dependent variables, the variable of interest, and the control variables.

Negative Binomial Regression

Model 1 of the negative binomial regression model (see Appendix C: Table 3) shows that being in the exceptional, extreme, or severe drought area is associated with engagement in significantly more water conservation behaviors than those not in the drought area ($p<.05$). Furthermore, results show that the overall model, as reflected by Wald χ^2, is significant ($p<.05$). Model 2 (see Appendix C: Table 3) indicates that residing in the exceptional, extreme, or severe drought area is marginally associated with engagement in more water conservation behaviors than those not residing in the drought area ($p<.10$). The model also shows that as age increases, so do the number of water conservation behaviors ($p<.001$ level). Furthermore, the results indicate that being male is associated with engagement in significantly fewer water conservation behaviors than women ($p<.05$). Likewise, non-whites are shown to be engaging in fewer water conservation behaviors than whites ($p<.01$). The income level of $30,000 to less than $50,000 is

associated with engagement in more water conservation behaviors than those making less than $30,000 ($p<.05$), and the income level of $100,000 and up is marginally associated with engagement in more behaviors than those making less than $30,000 ($p<.10$). The results also indicate that the model is significant ($p<.001$), as reflected by the Wald χ^2 being significant.

OLS Regression

Model 1 of the OLS regression model (see Appendix C: Table 4) shows that people who live in the exceptional drought area are 0.16 standard deviations higher than the average likelihood of changing behaviors than those not residing in a drought area ($p<.10$). Furthermore, the results of the F-test reveal that the model is significant ($p<.05$), with the reduced model explaining 4% of the variance in the reported likelihood of behavioral changes. Model 2 (see Appendix C: Table 4) indicates that people who are very concerned about the drought are 0.20 standard deviations higher than the average likelihood of changing behaviors than those in the other category of not very concerned ($p<.05$), and that a one year increase in age results in 0.09 standard deviations increase from the average likelihood of changing water conservation behaviors ($p<.001$). Results also indicate that men are 0.14 standard deviations lower than the average reported likelihood of changing behaviors than women ($p<.05$). Likewise, nonwhites are 0.21 standard deviations lower than the average likelihood of changing behaviors than whites ($p<.01$). Results also show that people with a household income of $30,000 to less than $50,000 are 0.44 standard deviations above the average likelihood of changing behaviors for people in the $30,000 or less income category ($p<.001$), people with a household income of $50,000 to less than $75,000 are 0.29 standard deviations above the average likelihood of changing behaviors for people in the $30,000 or less income category ($p<.05$), and people with a household income of $100,000 and up are 0.37 standard deviations above the average likelihood of changing water

conservation behaviors of people in the $30,000 or lower income category ($p<.01$). Also, the results of the F-test show that the model is significant ($p<.001$), with the full model explaining 19% of the variance in the reported likelihood of behavioral changes.

Limitations

There were certain changes that had to be made to the data, and there are also limitations. There were originally 800 cases in the dataset, but after removing missing cases for age, education, concern, owning home, and race, the sample size was reduced to n=746. Patterns with respect to refusing to answer the questions about engaging in behaviors and likely future behavior changes show a marked pattern. There were 78 instances of missingness across the seven conservation categories, there was no respondent that refused to answer all of the questions about water conservation behaviors. In the categories where the respondents do refuse to answer, it appears as though those people are reluctant to report truthfully because the behavior may be mandated, yet they are not doing it. Most notably, I found that the two behaviors (see Appendix B: Table 1) with the highest percentage of refusal are likelihood of watering the lawn and garden less (5.90%) and likelihood of washing the car less frequently (4.29%). Bans on lawn watering and car washing (except at facilities that recycle their water) have been mandated in the state of Georgia.

CHAPTER V

Discussion and Conclusions

Correlates of environmental concern within the literature are varied, and my findings differ somewhat from what the literature holds. My findings indicate a positive relationship between age and engagement in water conservation behaviors, which is contrary to the consensus within the environmental concern literature. Studies have revealed that younger people are more environmentally concerned than older people, but my results imply that there is a concern versus action gap. The environmental concern literature indicates that females are environmentally concerned with aspects that relate to household behaviors, like water conservation, since they engage in more housework than males. My results that non-whites on less likely than whites to engage in water conservation behaviors are consistent with the environmental concern literature. It is because engagement in such behaviors involves putting inward concerns into action. The literature reveals that blacks are not as likely as whites to put their environmental concern into action. My results indicate that those earning $30,000 to less than $50,000 and those earning $100,000 and up are more likely to engage in water conservation behaviors than those earning less than $30,000. These results are consistent with the environmental concern literature in that poor people have other problems with which to concern themselves. However, the Georgia drought affected most everyone, regardless of how residents responded to it.

Most Georgians have been hard hit by the drought. The results of the study indicate that 72% (see Appendix C: Table 2) of residents live in the exceptional drought area. To put this in perspective, there are eight million people in the state of Georgia, and four million of them live in the Atlanta metropolitan area, which was the hardest hit. This returns me to the fact that

drought is a problem which is both caused by human behaviors and exacerbated by the pressures that people put on the environment and its resources. The results of my analysis show that Georgians have been responsive to the drought. More than half of those surveyed have changed at least six behaviors (i.e., taking shorter showers, using faucets less, watering lawn or garden less, washing only full loads of clothes or dishes, washing car less frequently, and checking for leaks). Almost half of the residents are flushing toilets less frequently, and nearly 80% of them are very concerned about the drought (see Appendix C: Table 2).

However, there are geographical and demographic differences in response to drought. The purpose of this paper is to examine the effect of the immediate surroundings on engagement in water conservation behaviors and intentions towards doing such in the future. The results presented here show that those living in the exceptional, extreme, and severe drought areas are most actively responsive. This is the result of those residents being faced with the effects of drought. For example, those in the most harsh drought areas are visibly confronted day-to-day with dried up lakes and dormant lawns in their immediate surroundings. Being directly faced with these negative effects of drought leads the residents to respond through conservation behaviors, in an attempt to curb the effects.

Despite the face-to-face confrontation with effects, it is also important to note that demographic factors mediate the impact of place. The results indicate that those who are older, female, white, have modest annual incomes (i.e., those who earn $30,000 to less than $50,000 compared to those who earn less), and have a substantial annual income (i.e., those who earn $100,000 and up compared to those earning less than $30,000) are most likely to engage in more behaviors. The literature on environmental behavior supports the results in showing that the elderly engage in more pro-environmental behaviors, such as conservation, than younger people

(Hallin 1995, Scott 1999, Olli et al. 2001). Environmental sociologists speculate that the engagement of the elderly could be the result of having more time to carry out such behaviors, or it could be the generational result of being raised in an era of scarcity and being taught to conserve. However, the literature on environmental concern indicates that older people tend to be less environmentally concerned than younger people. As for females, the literature does reveal that they are more concerned with the environment and are, therefore, more likely to engage in environmental behaviors than men, especially when such behaviors are household related (Van Liere et al. 1980, McStay et al. 1983, Schahn et al. 1990). I speculate that in the case of my study, the gender effect could be the result of women doing more housework than men, thus, having more opportunities to engage in some of the behaviors listed such as changing how dishes and clothes are washed. As for whites, the results of the study also reflect previous findings (Aitken et al. 2006, Barr 2003, Gilg at al. 2006) that whites are more concerned with the environment than non-whites. The research also indicates that non-whites are less likely to put their concern into action through behavior than whites (Taylor 1989, Jones et al. 1994). The literature gathers this could be because non-whites (especially African Americans) do not have the ability to financially contribute to environmental purposes (Commoner 1971) and feel marginalized from society (Kreger 1973). The income effects are somewhat strange in that those who earn $30,000 to less than $50,000 and those who earn $100,000 and up are likely to engage in more conservation behaviors than those earning $30,000 or less. As indicated in the literature, having basic needs met is a prerequisite to engagement in environmental behaviors (Maslow 1975, Taylor 1982, Douglas et al. 1983). In other words, those with an annual income of $30,000 or less may have a difficult time providing food, clothing, and shelter for themselves and their families and, therefore, would be less likely to engage in environmental behaviors.

Additionally, it is possible that they already conserve (since water use has to be paid for), so it is difficult to conserve more. I also speculate that another explanation for these results is that the poor—like non-whites—are often alienated from society and from opportunities to engage in environmental behaviors. As hypothesized, place shows no effect on *intended* engagement in conservation behaviors. Perhaps this is because those who are going to respond already have done so, and because, as I speculate, seeing environmental degradation may cause you to act, but intentions to act are the result of more abstract orientations toward the environment. As with behavior engagement, demographic factors matter, and the patterns are similar.

There are several implications of this work. The first implication is that Georgians have been responsive to the drought, which is possibly the outcome of the high level of media and political attention, but clearly also because the residents see and feel the immediate effects. This suggests that the correct time to impose regulations and restrictions to protect water supply, when people are largely resistant to such restrictions, including growth controls, is during extreme climate events. This may not be the most effective time, in terms of environmental conservation, but it may be the only time to make real change. The second implication is that those who are going to respond do so, and people are more likely to respond when the crisis is local. The third implication of my findings is that it is possible that, even in a time of crisis, many people ignore the new regulations and restrictions, as indicated by the missing data. Respondents to the Peach State Poll were least likely to give responses to questions about lawn watering and car washing—the two behavior changes mandated by the state. Although I am cautious about the meaning of non-responses, the pattern is intriguing and one deserving of future study. Another, more important, question left unexplored in this study concerns the duration of the impact of the drought on behavior. In other words, how long will the residents of

Georgia continue to engage in water conservation behaviors? This question returns to determination of when is the best time to pass mandates on such behaviors, and it has implications for the long-term impact of crisis on conservation behavior.

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APPENDICES

Appendix A: 2007 Peach State Poll

[WATER]

INT3. Now, I would like to ask you some questions about Georgia's freshwater resources.

[Randomize order of W2 and W3]

W1. How concerned are you about the QUALITY of water in Georgia? Would you say you are very concerned, somewhat concerned, or not at all concerned? [Note to interviewer: please emphasize quality and be sure that the respondent is not focused on the shortage of water.]

1 Very concerned
2 Somewhat concerned
3 Not at all concerned
8 DK / No Opinion (vol.)
9 Refused (vol.)

W2. How concerned are you that Georgia may not have enough water in the next ten years?

Would you say you are very concerned, somewhat concerned, or not at all concerned?
1 Very concerned
2 Somewhat concerned
3 Not at all concerned
8 DK / No Opinion (vol.)
9 Refused (vol.)

W3. Please rate the QUALITY of Georgia's lakes, rivers, and streams; these are the waters used for drinking and recreational activities? Do you think that Georgia's lakes, rivers, and streams are in excellent condition, good condition, fair condition, or poor condition?

1 Excellent condition
2 Good condition
3 Fair condition
4 Poor condition
8 DK / No Opinion (vol.)
9 Refused (vol.)

W4a. To improve the quality of lakes, rivers, and streams – waters used for drinking and recreation – in your area of the state, would you oppose a $5 yearly fee?
1 Yes, would oppose a $5 fee .. Skip to W5a
2 No, would not oppose a $5 fee

8 Not sure (vol.) .. Skip to W5a
9 Refused (vol.) .. Skip to W5a

W4b. How about a $10 yearly fee? Would you oppose a $10 yearly fee to improve the quality of water?
1 Yes, would oppose a $5 fee .. Skip to W5a
2 No, would not oppose a $5 fee
8 Not sure (vol.) .. Skip to W5a
9 Refused (vol.) .. Skip to W5a

W4c. Would you oppose a $25 yearly fee to improve the quality of water?
1 Yes, would oppose a $5 fee .. Skip to W5a
2 No, would not oppose a $5 fee
8 Not sure (vol.) .. Skip to W5a
9 Refused (vol.) .. Skip to W5a

W4d. Would you oppose a $50 yearly fee to improve the quality of water?
1 Yes, would oppose a $5 fee .. Skip to W5a
2 No, would not oppose a $5 fee
8 Not sure (vol.) .. Skip to W5a
9 Refused (vol.) .. Skip to W5a

[SPLIT SAMPLE EXPERIMENT – randomly assign respondents to either Version A or Version B]

[Version A]

W5a. In considering water quality for drinking, how important or unimportant is the smell or odor of the water … (Read response options as necessary)
1 Extremely important
2 Somewhat important
3 Somewhat unimportant
4 Completely unimportant
8 Not sure (vol.)
9 Refused (vol.)

W5b. In considering water quality for drinking, how important or unimportant is it that the water is clear, not cloudy … (Read response options as necessary)
1 Extremely important
2 Somewhat important
3 Somewhat unimportant
4 Completely unimportant
8 Not sure (vol.)
9 Refused (vol.)

W5c. In considering water quality for drinking, how important or unimportant is the color of the water … (Read response options as necessary)
1 Extremely important
2 Somewhat important
3 Somewhat unimportant
4 Completely unimportant
8 Not sure (vol.)
9 Refused (vol.)

[Version B]

W5a_2. In considering water quality for recreation, how important or unimportant is the smell or odor of the water … (Read response options as necessary)
1 Extremely important
2 Somewhat important
3 Somewhat unimportant
4 Completely unimportant
8 Not sure (vol.)
9 Refused (vol.)

W5b_2. In considering water quality for recreation, how important or unimportant is it that the water is clear, not cloudy … (Read response options as necessary)
1 Extremely important
2 Somewhat important
3 Somewhat unimportant
4 Completely unimportant
8 Not sure (vol.)
9 Refused (vol.)

W5c_2. In considering water quality for recreation, how important or unimportant is the color of the water … (Read response options as necessary)
1 Extremely important
2 Somewhat important
3 Somewhat unimportant
4 Completely unimportant
8 Not sure (vol.)
9 Refused (vol.)

[END SPLIT SAMPLE]

W6. How important do you think it is for Georgia's residents to conserve water? Do you think it is very important, somewhat important, or not at all important? [Interviewer note: If asked, "conserve" simply means to use less.]

1 Very important
2 Somewhat important
3 Not at all important
8 DK / No Opinion (vol.)
9 Refused (vol.)

W7. People can engage in several behaviors to reduce the amount of water they use. For each of the following, please tell me whether you are very likely, somewhat likely, or not at all likely to do this or if this is something you already do. [RANDOMIZE ORDER OF ITEMS a THROUGH g]

The first is (READ ITEM).

How about (NEXT ITEM)? (PROBE IF NEEDED: Please tell me whether you are very likely, somewhat likely, or not at all likely to (ITEM) or if this is something you already do.

a. Take shorter showers
1 Very likely
2 Somewhat likely
3 Not at all likely
4 I already do this
8 DK / No Opinion (vol.)
9 Refused (vol.)

b. Use faucets less (e.g. turn off while brushing teeth, scrubbing dishes, etc.)
1 Very likely
2 Somewhat likely
3 Not at all likely
4 I already do this
8 DK / No Opinion (vol.)
9 Refused (vol.)

c. Water your lawn or garden less often
1 Very likely
2 Somewhat likely
3 Not at all likely
4 I already do this
8 DK / No Opinion (vol.)
9 Refused (vol.)

d. Wash only full loads of clothes and dishes
1 Very likely
2 Somewhat likely
3 Not at all likely
4 I already do this
8 DK / No Opinion (vol.)
9 Refused (vol.)

e. Wash your car less frequently
1 Very likely
2 Somewhat likely
3 Not at all likely
4 I already do this
8 DK / No Opinion (vol.)
9 Refused (vol.)

f. Routinely check fixtures for leaks
1 Very likely
2 Somewhat likely
3 Not at all likely
4 I already do this
8 DK / No Opinion (vol.)
9 Refused (vol.)

g. Flush toilets less often
1 Very likely
2 Somewhat likely
3 Not at all likely
4 I already do this
8 DK / No Opinion (vol.)
9 Refused (vol.)

W8. Do you think that households that use a higher than average quantity of water should pay higher rates per gallon than households that conserve water?

1 Yes, should pay higher rates
2 No, should not pay higher rates
3 It depends (vol.)
8 Not sure (vol.)
9 Refused (vol.)

W9. How much attention have you paid to news about the drought in Georgia – a great deal, some, very little, or none at all?

1 A great deal
2 Some
3 Very little
4 None at all
8 DK / No Opinion (vol.)
9 Refused (vol.)

W10. How much influence has the drought had on your daily activities – a great deal, some, very little, or none at all?

1 A great deal
2 Some
3 Very little
4 None at all
8 DK / No Opinion (vol.)
9 Refused (vol.)

W11. How much influence has the drought had on the behaviors you have taken to conserve water – a great deal, some, very little, or none at all?

1 A great deal
2 Some
3 Very little
4 None at all
8 DK / No Opinion (vol.)
9 Refused (vol.)

W12. How likely are you to continue these water conservation behaviors – very likely, somewhat likely, not at all likely?

1 Very likely
2 Somewhat likely
3 Not at all likely
8 DK / No Opinion (vol.)
9 Refused (vol.)

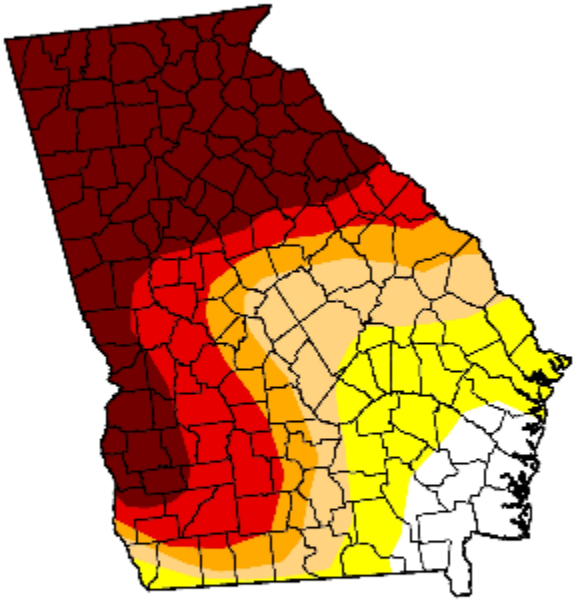
Appendix B

U.S. Drought Monitor
Georgia

November 27, 2007
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	7.9	92.1	76.9	63.4	53.3	37.0
Last Week (11/20/2007 map)	7.9	92.1	77.1	63.5	53.3	36.9
3 Months Ago (09/04/2007 map)	14.5	85.5	72.2	60.0	40.7	19.0
Start of Calendar Year (01/02/2007 map)	12.2	87.8	3.7	0.1	0.0	0.0
Start of Water Year (10/02/2007 map)	24.2	75.8	64.2	52.6	39.4	27.0
One Year Ago (11/28/2006 map)	82.2	17.8	4.1	0.1	0.0	0.0



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

http://drought.unl.edu/dm

USDA National Drought Mitigation Center

Released Thursday, November 29, 2007
Author: Brad Rippey, U.S. Department of Agriculture

Appendix C

Table 1. Reported Likelihood of Engaging in Water Saving Behavior

	Take shorter showers	Use faucets less	Water lawn or garden less	Wash only full loads of clothes and dishes	Wash car less frequently	Check for leaks	Flush toilets less often
Already do this	55.23	62.87	54.83	67.16	59.38	57.24	47.99
Very likely	20.11	18.10	16.89	20.38	19.03	25.20	12.33
Somewhat likely	15.15	13.67	8.45	8.31	6.57	12.33	16.76
Not at all likely	9.38	4.96	13.94	3.49	10.72	4.29	21.58
Refused to answer	0.13	0.40	5.90	0.67	4.29	0.94	1.34

Table 2. Descriptive Statistics

Dependent Variables	
Number of behaviors already engaged in	4.05 (2.47)
Likelihood of changing behavior	0.00 (0.63)
Independent variables	
Drought conditions at R's home	
Exceptional	72.12
Extreme or Severe	14.08
Moderate or abnormally dry	12.06
No drought	1.74
Very concerned with drought	79.22
Age categories	
18-25 years	3.62
26-35 years	7.37
36-45 years	14.48
46-55 years	29.62
56-65 years	25.47
66 and older	19.44
Male	48.12
Nonwhite (including Latino/Hispanic)	22.25
Educational attainment	
High school diploma or less	27.61
Some college, no 4-year degree	25.20
College degree	26.68
Post graduate work	20.51
Does not own home	13.94
Household income	
Less than $30,000	16.22
$30,000 to less than $50,000	17.01
$50,000 to less than $75,000	21.62
$75,000 to less than $100,000	17.01
$100,000 or more	28.14

NOTE: Means (and standard deviations) or percentages shown.

Table 3. Negative binomial regression of effects of location on number of water conservation behaviors.

	Model 1	Model 2
Drought conditions		
Exceptional	0.72*	0.50†
	(0.32)	(0.27)
Extreme or Severe	0.68*	0.54†
	(0.33)	(0.30)
Moderate or abnormally dry	0.36	0.35
	(0.35)	(0.29)
No drought	---	---
Very concerned with drought		0.03
		(0.10)
Age		0.11***
		(0.03)
Male		-0.17*
		(0.08)
Nonwhite		-0.29**
		(0.11)
Educational attainment		
Education high school or less		---
Education some college		-0.06
		(0.12)
Education college degree		-0.07
		(0.13)
Education post grad		-0.02
		(0.14)
Does not own home		-0.04
		(0.14)
Income levels		
$30,000 or less		---
$30,000 to less than $50,000		0.32*
		(0.14)
$50,000 to less than $75,000		0.16
		(0.15)
$75,000 to less than $100,000		0.04
		(0.19)
$100,000 and up		0.33†
		(0.17)
Constant	0.63*	0.45
	(0.31)	(0.37)
Log psuedolikelihood	-1777.54	-1479.34
Wald χ^2	9.61*	51.42***
n	746	629

NOTE: Regression coefficients shown (robust standard errors in parentheses)
†p<.10; *p<.05; **p<.01; ***p<.001

Table 4. Likelihood of changing behaviors (standardized) regressed on drought conditions

	Model 1	Model 2
Drought conditions		
Exceptional	0.16†	0.04
	(0.10)	(0.10)
Extreme or Severe	0.08	0.04
	(0.14)	(0.13)
Moderate or abnormally dry	-0.23	-0.16
	(0.15)	(0.14)
No drought	---	---
Very concerned with drought		0.20*
		(0.09)
Age		0.09***
		(0.02)
Male		-0.14*
		(0.06)
Nonwhite		-0.21**
		(0.08)
Educational attainment		
Education high school or less		---
Education some college		-0.13
		(0.11)
Education college degree		-0.06
		(0.09)
Education post grad		-0.09
		(0.11)
Does not own home		0.02
		(0.10)
Income levels		
$30,000 or less		---
$30,000 to less than $50,000		0.44***
		(0.13)
$50,000 to less than $75,000		0.29*
		(0.13)
$75,000 to less than $100,000		0.19
		(0.14)
$100,000 and up		0.37**
		(0.13)
Constant	-0.20*	-0.62**
	(0.09)	(0.21)
R^2	0.04	0.19
F	3.46*	7.18***
n	746	629

NOTE: Regression coefficients shown (robust standard errors in parentheses)
†p<.10; *p<.05; **p<.01; ***p<.001

VITA

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