

# **THE WATER CRISIS: WATER, GROWTH, & DEVELOPMENT**

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April 21, 2008

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## **I. Introduction**

As the great sage Mark Twain observed, “Whiskey is for drinking and water is for fighting.” This is particularly true in Georgia, where we have been fighting with our neighboring states for over 200 years. There are many who predict that water will be more violently contested than oil within the next 50 years.

In Georgia, such will almost certainly be the case as contested water resources continue to dwindle under the uncoordinated management of multiple states and the demands of a rapidly increasing population. In the next few pages, we will examine the presence of drought in Georgia, the historical context for our present water resource situation, and the economic and environmental impacts of decreased rainfall and disrupted water cycle.

## **II. History**

Our current drought is one of the worst Georgia has experienced in 100 years. During the summer of 2007, Governor Sonny Perdue declared a state of emergency for 85 counties in the northern part of the state that were withering under a stage 4 drought, the worst classification possible (Eilfling, S. December 28, 2007).

However, this is not the first time Georgia has suffered such a plight. Over the past 325 years, Georgia has suffered 13 long-term, severe droughts have impacted the state over the past 325 years. On average, Georgia experiences a drought lasting three or more years about once every 40 years and these droughts range in severity. (Eilfling, S. December 28, 2007)

Since 1960, Georgia’s population has increased from near 4 million inhabitants to over 9 million, while the water resources have remained constant. Atlanta has a limited

water supply, with over 98% of the water we drink coming from surface water, which means we are particularly sensitive to the effects of drought.

In addition, the Chattahoochee is the smallest river in the country serving as a major source of water for a region of this size, yet Atlanta continues to grow at an unprecedented rate. For example, the Atlanta metro area added roughly 890,000 inhabitants between 2000 to 2006. This tremendous migration makes Atlanta the fastest growing metro area in the nation. (Eilfling,S. December 28, 2007)

### **Tri State Water Disputes**

Alabama, Tennessee, and Georgia have been in a fruitless legal battle over shared water resources that flow through all three states since the late eighties, although disputes have been going on for an even longer period of time. The disputes concern how the states will reach agreement over present and future water allocations of the two basins, the Apalachicola-Chattahoochee- Flint (ACF) and Alabama-Coosa-Tallapoosa (ACT), as pictured below. Source: Southern Environmental Law Center



While Georgia would like to retain more water for our growing demands, Alabama and Florida are rightly concerned about maintaining an adequate flow for their own needs, as they are downstream of Atlanta consumption.

The real conflict began after the construction of the Buford Dam and Lake Lanier by the U.S. Army Corps of Engineers. When constructed over fifty years ago, Lanier's authorized purpose was to provide flood control, hydropower and navigation. Over time, metro Atlanta began to rely on Lake Lanier primarily for its water supply and the Corps began issuing interim contracts to municipal water supply providers without any evaluation under the National Environmental Policy Act (NEPA) ("Tri-State Allocations." Upper Chattahoochee RiverKeeper).

In 1989, the Corps released a report which recommended that a portion of the water being used for hydropower should be reallocated for water supply in the Atlanta region. In 1990, The State of Alabama became irate and filed a lawsuit in response in challenging reallocation plans as designed by the U.S. Army Corps of Engineers. The lawsuit claimed that reallocating the water would favor Georgia's interests. In addition, they claimed that the U.S Army Corps of Engineers was in violation of NEPA by having ignoring the environmental impacts of reallocating water on the downstream states. In 1990, Florida and Georgia both petitioned to intervene in the lawsuit ("Water Dispute History" Upper Chattahoochee RiverKeeper).

Next, all three states and the Corps agreed to conduct a comprehensive study of all of the water issues affecting the ACF and ACT Basins with the goal of determining how to fairly allocate the water resources. During this time, the initial US Army Corps of

Engineers recommendation to reallocate water and all legal battles were halted in order to complete the studies (“Tri-State Allocations.” Upper Chattahoochee RiverKeeper).

From the studies conducted, two compacts were created, one for each basin. The compacts were officially ratified by Congress in 1997, after they passed all three state legislatures, and created a structure that would allow the states to work together to determine the best method for managing the resources, while litigation remained on hold.

Sadly, the states could not reach an agreement during these compacts, and they expired without resolution in 2003 (ACF) and 2004 (ACT). The tragedy of the failure of these compacts is that the conflict is now enmeshed in the courts, where water supply and allocation continue to play out in disjointed decisions in three cases.

### **Tennessee River**

The Tennessee River is another resource of dispute in recent political proceedings over water. The Georgia legislature recently made a much discussed and, one might conclude, incredibly asinine gesture in claiming a portion of the Tennessee River for Georgia’s water use. Georgia bases this claim to all land up to the 35<sup>th</sup> parallel upon the basis of the original colonial charter, although the land in question has been a part of Tennessee for the entire existence of either state. The confusion apparently originates with the map pictured below. (Chapman, D. March 27, 2007).



This claim is seated in a historical oddity. Apparently, the 1818 map pictured here was made by a mathematician (not a surveyor) who was ill equipped with fairly clap trap, defunct equipment meant for measuring distances at sea, not on land. On top of technical difficulties, the party was completely terrified by what they described as a harrowing encounter with a Native American war party (Dewan, S. February 22, 2007). So, it is not surprising that although the colonial charter describes Georgia as extending north to the 35<sup>th</sup> parallel, the legally descriptive map charts Georgia as ending on the 34.59 degrees.

Georgia is suddenly demanding, after 200 years, that this boundary be re-drawn. The Georgia State Legislature has taken this fairly transparent action clearly because we would then have access to the Tennessee River, which contains almost 15 times the flow of the Chattahoochee and could solve our water woes.

### **III. Effects of the Drought**

**Drought will have an economic and environmental impact on the state**

A recent report produced by The University of Georgia places the overall cost of the drought to be \$1.3 billion during the 2007 year (July 2007 “Georgia Economic Loses due to 2007 Drought”).

This estimate entails all the total economic output impact. Within the state of Georgia, the most severe impact of the drought will be on the agricultural sector, where the drought could really wreak havoc on the economic backbone of the rural communities.

It is interesting to note here, that although farmers will be likely producing far less due to the drought, most consumer food prices will not necessarily rise drastically or even noticeably. This is because Georgia farmers concentrate their crops in cotton and peanuts. Eventually, a drought across the entire growing season would have an impact on the price of clothing.

The majority of the other agricultural industries in Georgia, those being poultry and beef, rely primarily on the grains grown in the Midwest, not the south. Another report from the University of Georgia College of Agricultural and Environmental Sciences suggested that even though consumers might not feel the financial strain of the drought, low commodity prices and government mandated reductions in the traditionally more profitable crops may be the tipping factors which couple with drought to induce a collapse and significant exodus of farmers from the state (McKissick, J. June 27, 2007).

The same report calculated the 2007 economic loss due to drought as \$787.2 million. These losses come from drastically reduced productivity as well as rising water costs. Other industries that you’ve heard of like landscaping and car washes have suffered and these will cause a ripple effect throughout the economy. Tourism has also suffered



greatly, as Lake Lanier is hardly a welcoming vacation spot any longer. Environmental impacts are even further reaching and more difficult to sum up.

Other negative impacts include reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape (“Drought Impacts,” National Drought Mitigation Center).

Along with the drought comes dry, parched earth, where the ground forms a miniscule dry crust, making it more difficult for water to be quickly absorbed by the ground. This dryness brings an escalation in the increase of runoff from impervious surfaces during rainstorms. Stormwater runoff is a non-source point of pollution and *the* major source of water quality degradation, greater even than specific point sources of pollution, such as industrial plants. Therefore, by increasing the impervious surface through development and simultaneously decreasing the absorptive capacity of the soil through drought, we are actually further degrading the quality of our existing, finite water resources.

Increased runoff, less generative soil, disrupted ecosystems, particularly when humans then try to manage ecosystems. In some cases, polluted water was used to irrigate wetlands. Water quality during drought is another concern for municipalities, since pollutants (i.e., chemicals and bacteria) become concentrated in smaller volumes of water that can be potentially harmful to human health. Restricting pollutant emissions and acquiring supplemental water resources and/or more reliable water sources are just a few

of the ways of addressing water quality issues during drought (“Drought Impacts,” National Drought Mitigation Center).

#### **IV. LEGAL ANALYSIS**

##### ***Legal History of Water in Georgia***

The State of Georgia's land use authority is limited to enacting general laws to establish procedures to preserve the natural resources of the state. Georgia derives this power from Article III of the state's Constitution which reads, “General Assembly shall have the authority to provide restrictions upon land use in order to protect and preserve the natural resources, environment and vital areas of this State.” Constitution of the State of Georgia Article III. The state's constitution grants home-rule authority to local governments to enforce those laws. The role of the state is to mandate and regulate and the local governments take on an enforcement role. Historically, Georgia's water laws are adapted from the riparian rights doctrine, which is common in most eastern states. Riparian rights are defined as the natural availability of the land to the water and riparian landowner's rights concerns land that abuts a body of water. Georgia's riparian rights theory was defined in Pyle v. Gilbert. In Pyle, an agricultural water use dispute involved the plaintiff's lower riparian right to receive natural flow of the water without diversion. The lower riparian owner's use was subject to the right of the defendant's upper riparian reasonable use. The court provided what would be Georgia's version of the riparian rights law, which is defined as “a natural flow theory modified by a reasonable use provision.” Pyle v. Gilbert 265 S.E.2d 584. Georgia adopted a common property rule of water rights to mean that there is no title to water that runs over the land but all owners are subject only to a reasonable use.

Some courts suggest that Georgia should switch to a modified restrictive reasonable use provision to protect against the over burden of agricultural and manufacturing use on the water shortfall dilemma. For example, in Georgia the use of water for agricultural purposes led to the adoption of the Flint River Protection Act of 2000, which provided monetary incentives for larger users of water (farmers) to find alternative methods of water use. The state was forced to quickly react as the Flint River was drying up due to overuse. Some critics of the riparian rights system argue that a modified reasonable use provision means regulated riparianism for eastern states where water shortages caused by drought protects against the uncertainty and lack of process for managing water during serious shortages in riparian use states.

Water markets and water banks have been suggested in states that use the riparian doctrine. The water markets on a reasonable use basis have been controversial because water is considered a public good and the members of the public without the means to pay for water should not be punished by not receiving access. However, advocates for water markets and water banks argue that water should not be a public or common good. A charge for water would create incentive for over-users to conserve and think about the consequences of their actions. Therefore, riparian states such as Georgia consider a more regulated riparian use of water.

### ***Supreme Court Legal Precedence on Water Wars***

For a century Georgia has been embroiled in a battle over water use with its border states. As water shortages due to drought conditions become increasingly extreme, Georgia and other eastern states have become more litigious in its fight for access to lakes, rivers, and streams. Georgia is currently in a battle with Alabama over

several river basin systems. In the past Georgia has engaged in a dispute over coastal lands in South Carolina. The state is fighting Tennessee and Florida over runoff from the Lake Lanier tributary. The most recent dispute is a boundary dispute between Georgia and Tennessee over land that would grant a larger territory to Georgia over the Tennessee River.

The United States Supreme Court has established a set of criteria for litigating water disputes between states with similar laws such as riparian rights or appropriative rights. The Court originally applied the conflict of laws doctrine, a body of law to determine how to settle diversity suit, in interstate water disputes, and later adopted the equitable apportionment doctrine for these types of decisions. The Court in Kansas v. Colorado decided a dispute brought by Kansas to prevent the state of Colorado from diverting water. In this initial equitable apportionment decision, the court applied a more broadened burden of proof by the complaining state to show injury. The implications of application of the doctrine required a riparian rights state and a prior appropriation state to distribute the water equitably depending the nature of use. Kansas v. Colorado 206 U.S. 46 (1907). However, in later cases, such as Connecticut v. Massachusetts and New Jersey v. New York, the Court applied equitable apportionment in favor of the upstream state unless the complaining downstream state could show proper injury.

The injury to complaining states must be by clear and convincing evidence of harm due to diminished water flow. The Court in Washington v. Oregon required a stringent burden of proof which required Washington, the complaining state, to show that there was more than a small amount of water shortage caused by Oregon's diversion. The equitable apportionment doctrine continued to be applied in water dispute cases

between states with a high burden of proof for both the complaining state and the diverting state. States that seek to resolve a dispute in the Supreme Court must first prove enough harm by clear and convincing evidence, then the burden shifts to the diverting state to show that the use of reasonable and show by clear and convincing evidence that there will be no injury to the complaining state. Ultimately the court would have a preference for prior Congressional action. If Congress has already enacted a law to regulate interstate water use, the Court may not hear the dispute. Alternatively, states can resolve disputes with Compact Clauses upon the approval of Congress. The current litigation between Alabama, Georgia and the Army Corps of Engineers involves an interstate compact known as the Water Supply Act of 1958.

### ***Effects of Implementation of State and Local Restrictions***

#### **▪ *Legal Remedies***

Until the state of Georgia resolves its disputes with border-states over water rights, the state must use its constitutional power to regulate and protect the vital areas. Drought conditions have caused Georgia to take measures to restrict water use and consider alternatives to present water distribution. As discussed above, Georgia created the Flint River Protection Act in response to the crippling effects of the overuse of the Flint River for agricultural purposes. Georgia provided monetary incentives to farmers for the stop use of the river. However, the effects of the legislative acts to protect the state from detrimental water shortages have caused citizens to seek legal action on takings claims. In Pope v. Atlanta the riparian landowner sought to construct a tennis court to abut the river on her property. The plaintiff was prohibited from construction by the Metropolitan River Protection Act of 1973, which was enacted as an exercise of the state's police powers. The Act was created to provide a method for political subdivisions

in metropolitan Atlanta to use the power of the State to protect the public water supplies through a comprehensive plan. Plaintiff, Pope sought equitable relief and argued that the enforcement authority acted unreasonably and arbitrarily in its enforcement of the Act. Plaintiff also argued that enforcement of the Act was a violation of her Fifth and Fourteenth Amendment rights and therefore justified compensation. However, the Act expressly states that the goals are to protect the public health and safety and to set standards for the reasonable and non-arbitrary achievement of safe water and river-bed management and is thereby constitutionally valid. The Supreme Court of Georgia subsequently held that the plaintiff's proposal met the minimum standard requirements of the Act. Pope is just one example of a citizen's response to state action to protect the "vital areas" of the state.

Metropolitan Atlanta, like other urban cities has witnessed an exponential amount of growth in recent decades. The city and state have begun to enforce regulations to protect the area during times of drought and increased population growth. In addition to restrictions on proposed riparian development, consideration of water banks and other fee systems to regulate water use, cities and states also consider measures such as moratoria on development projects to protect from water shortages. Opponents of moratoria will argue a taking and diminution in value of the property, and an arbitrary and capricious action by the government. States derive their precedence to regulate zoning under the rules of the landmark U.S. Supreme Court case Penn Central Transportation Co. v. New York City. Under a Penn Central takings analysis, the Court will look to the economic effect on the landowner, the reasonable investment-backed expectations and the character of the government's actions. In Tahoe-Sierra Preservation Council v. Tahoe Regional

Planning Agency the Court held that a 32-day moratorium on development around Lake Tahoe until developmental impact studies were completed did not constitute a per se taking after applying the Penn Central analysis. The state imposed valid police powers to preserve the quality of the lake. In a dispute over a development moratorium, an earlier New Jersey court held that it was an invalid exercise of the barrier island township's police powers. That court held that the municipality did act arbitrarily and capriciously to enforce a moratorium on residential development because the "situation must be exigent, the causes must be adequately explored and it must be demonstrated that other less extreme solutions have been investigated." New Jersey Shore Builders Association v. Township Committee of the Township of Dover 468 A.2d 742 (1983).

Before the Tahoe decision, the U.S. Supreme Court held in Ketchel v. Bainbridge Township that lot-size zoning restrictions was invalid and required consideration of a Fifth Amendment takings without just compensation. The plaintiff developers sought a permit to develop residential dwellings on 1-acre lots; however, the local zoning laws were amended to only allow large tract 3-acre lot development on the parcel. The municipality reasoned that the large lot zoning was in the interest of protecting the underground water supplies. The Court held that feasibility studies were conducted that supported a claim of adequate water supply to support smaller lot sizes and held for the developers. Additionally, under a Fifth Amendment takings question, the larger lot size requirements would have diminished the value of the lot for the developers and would require just compensation.

Other takings challenges may result from water use restrictions such as odd-even address lawn watering schedules and restrictions to the use of swimming pools or outdoor water fountains. Such restrictions may be considered aesthetic zoning.

In conclusion, unless the state and local government provide incentives for water users to consider better conservation methods, the restrictions on development could become greater as the state approaches dire needs for access to water. However, development restrictions for zoning permits may lead to an increase in litigation to compensate developers for any investment loss. Until that time, the state of Georgia has the power to exercise its protection for the “vital areas” of the state. Furthermore, the Supreme Court grants power to the states to implement laws that protect the public health, safety and welfare so long as those laws are not an arbitrary and capricious use of zoning power. To protect against a finding of arbitrary enforcement of laws, the state should conduct proper feasibility studies and draft sound comprehensive statewide water and development plans in conjunction with estimated future growth in urban areas prior to enforcement of the new laws to avoid hardships in litigation.

## **V. Urban Growth & Water Availability**

Urban growth may be seen to have disadvantages, but one advantage it does hold is in the realm of water availability and water management. While urban centers do contain more people – each requiring a certain level of water to thrive – they can concentrate those people away from watershed areas, which have become tainted in large part due to suburban sprawl.



Take for example water runoff. It is a process that occurs naturally from mountains and hills flowing into watersheds, which flow back to lakes and other large bodies of water. This allows for the right amount of water to enter and remain in a watershed or flow downstream as needed. Watersheds also absorb a great deal of groundwater that replenishes underground aquifers (a major source of drinking water in the United States). (Funders 3) However, watersheds in and around metropolitan areas have become manipulated through development patterns and have lost a great deal of their effectiveness to control runoff. Sprawling patterns often lead to parking lots and roads unintentionally covering large portions of a watershed, which greatly inhibits the ability of groundwater to recharge. Also, runoff is redirected towards the watershed at a much faster rate than intended naturally, so polluted water (tainted from chemical compounds dispersed from a variety of sources) cannot be naturally purified and removed from the watershed at a fast enough rate. If the runoff does not go to its natural watershed, it is then redirected towards another watershed that may not be able to handle it; as a result, that watershed may suffer flooding while the area that needed the water or could handle it does not receive it.

This was the case in the metropolitan Atlanta region during the 1980s and 1990s. Many watersheds in the counties surrounding the city became covered with large parking lots that redirected the flow of water. Runoff then could not flow to places where it was needed; an especially great problem in Atlanta since much of the area's water comes from Lake Lanier, which is located within the Chattahoochee River watershed area. Experts speculate that the Atlanta region lost over 100 billion gallons of water every year during the aforementioned decades to runoff that failed to flow towards Lake Lanier and

other critical watersheds or replenish groundwater (Funders 3). Essentially, it was waster water that could have supplied the water needs for almost 2 million people annually.

As can be seen, a great deal of water has been lost through watershed manipulation and suburban development, but it could make someone wonder, “Where does all that water go?” The primary destination for suburban water is domestic uses, which have greatly increased in recent decades with the addition of large single-family unit neighborhoods. This addition of new residents has brought in huge revenues for growing cities and counties, but more development creates the need for more water storage capacity and reservoirs have not been able to meet those demands. Also, many municipalities have allowed growth to continue without first installing adequate infrastructure. This leads to even more redirected water runoff and improperly managed watersheds.

Dealing with the effects of growth on water availability may take a good deal of time to recover from, but there have been several solutions presented that could help to turn the tide. These solutions have presented themselves in two primary forms: Domestic water recycling and use limitation and new planning strategies. For water recycling, the most viable long-term solutions appear in the use of rainwater and greywater. Rainwater can be collected at a house from gutters and piped into a large underground storage tank that first filters out leaves and debris. The water can then be directly plumbed into a house and used for certain activities such as clothes washing or toilet flushing. This is possible because rainwater is softer than some other types of water and is chlorine-free (Irain). If rainwater were used in a typical household only for clothes washing and toilets, it could save forty percent or more of the domestic water going into a

house from public water sources (Brac). It could also help to lower water bills as the stored water can bypass the house's public meter entirely.

Greywater is a different story because it is much dirtier than rainwater. It is collected from the flushing of toilets and the draining of sinks, so it contains more dirt and chemicals than rainfall (Wikipedia). However, it can be very useful for irrigation purposes because plants can receive nutrients from wastewater after it is treated to remove the most harmful substances. Like rainwater tanks, a greywater tank can be buried underground and piped directly to an irrigation system.

Apart from water recycling, many homeowners have discovered incentives to limiting water use. For example, many municipalities around the city of Atlanta have begun to offer water bill rebates or incentive checks to homeowners who implement low-flow plumbing in their homes. Low-flow plumbing mixes water with air in nozzle heads to reduce splashing excesses and water waste caused by most plumbing. Not only do the homeowners receive monetary compensation from their local government, they also save on their water bills; a low-flow device in a shower alone can yield significant savings since it accounts for nearly thirty-five percent of domestic water use (Brac).

Obviously there are many solutions for reducing water uses at the individual homeowner level, but what can be done by community and regional planners to better control development and protect water availability for large populations? One idea is to better regulate development in and around undeveloped watersheds. As a general rule, if more than 10% of watershed acreage is covered in impervious surfaces (rooftops, parking areas, roads, etc.), then the ability to control runoff and absorb groundwater is severely compromised. Many of the watersheds nationwide containing development are at or

above the 10% area, so many municipalities are encouraging growth to be concentrated towards those areas as well as non-watershed areas as a means of protecting undeveloped watersheds. An example of this can be seen in the state of Maryland, where state law guides public investment money towards already developed areas or those approved for urban expansion. Additionally, funds are kept away from rural areas that the state and local governments do not deem appropriate or necessary for growth. (Funders 11)

A second idea for dealing with water availability is to encourage better planning at multiple levels simultaneously. Many times, regional planners work to organize a great deal of land that encompass several watersheds, but their ideas for water management may differ greatly from local counties or cities that regulate water on the neighborhood or site scale. Conversely, local authorities work to plan at a small scale and are not always forced to reconcile their practices with a much larger regional plan. Better coordination between development at the regional, neighborhood and individual site levels should be achieved. For instance, some states have programs along coastlines that limit the amount of impervious surfaces in a new development and give preference to lower-density projects (Funders 13). This creates a problem in that a regional scale concept of helping to protect a natural watershed area was applied on a site scale; developers were not able to build more densely in an area of the region where density would have been most appropriate to the region naturally, socially, and economically and it forced them to sprawl out into other areas that then created new runoff problems for a watershed.

A third concept for dealing with water availability is to create greater incentives for urban and smart growth to planners and developers who seek to better protect

undeveloped watersheds. As stated before regarding the state of Maryland, laws were enacted to regulate development, and while legal regulations are important, they can often exacerbate developers by decreasing profit margins or developing in market areas or sectors they are unfamiliar with. Consequently, their only other incentive is to continue to spread into rural areas seeking economic incentives from new development as well as relief from a lack of state funds that they may not be receiving on account of regional and statewide growth management laws. If developers are given tax relief or other incentives as a reward by government, they are more likely to try and create projects within already developed areas. Also, local governments are often given a greater proportion of federal transportation funds for greater promotion and legislation of growth management. Some of those funds could then be distributed as an incentive to developers to better incorporate their ideas into an appropriate setting.

## **VI. Federal Regulations**

Water is something that most people today take for granted. However, water is a necessary resource that must be conserved. Currently water is readily available, but the situation is undergoing change. The future of the availability of water is rising to the forefront of concern. Yet, it is very apparent that most Americans have taken their water supply for granted. Water is viewed as a clear, cheap, and abundant resource. According to EPA estimates, the average water bill consumes only 0.7% of the average median US household's income.

The future availability of water is also being threatened on another front. The US water infrastructure is beginning to show numerous signs of age and in some places is failing. It is estimated that an average of 237,600 water main breaks occur each year in

the United States. The EPA has estimated that it will take \$151billion - \$1trillion to replace only 3 generations of failing water mains. This is an enormous burden to bear, especially in some small towns which would be required to pay an average of \$6,900 per household. Action must be taken immediately to begin the process of replacing these failing water mains. The federal and state governments must increase funding for water infrastructure as well as encouraging privatization.

An attempt at the privatization necessary was exhibited by the City of Atlanta in 1998. The City of Atlanta signed a 20-year, \$428million contract with United Water to run and operate the city's water system. This was the biggest privatization contract in the US at that time, and was projected to save millions. This was a political and social disaster. However, there was much to be learned from this blunder. Privatization can only move forward now.

There are many Federal Regulations which weight heavily on the issue of water conservation. Some of the note-worthy regulations are: CRF Title 18: Conservation of Power and Water Resources, CRF Title 7, Part 1410: Conservation Reserve Program, Federal Energy Management Program, and the Commerce Clause.

Another term that has gained prominence lately is the phrase "water war". In the southeastern United States, many states are arguing over the water(s) that cross over state lines. This is especially so with the disputes between southeastern states. Alabama, Florida, and Georgia have been arguing over the shared Apalachicola-Chattahoochee-Flint (ACF) River Basin for the past 10 years (Hull). Due to the failure of their interstate discussions, the Federal government has stepped and contracted the Army Corps of Engineers to write and interstate agreement between the three states. Also, there is the

great debate of Georgia vs. Tennessee Valley Authority on a disputed portion of the Tennessee River. This too will be resolved by the Federal government, due to lack of mediation by both states. As one can see, the Federal government is very active in mediation and dispute resolution. However, there must be more attention paid to preventative measures.

### **State Regulations**

The individual states are generally more progressive and innovative in regards to water conservation. Some of the major players are Arizona, California, Georgia, Massachusetts, New Mexico, and Tennessee. Arizona was known for its developers having the ability to build beyond the limits of a sustainable water supply. Now Arizona has passed legislation implementing a sustainable water supply growth boundary (Our Water). California is a great leader on many environmental fronts. Currently, the state of California has been under a court order to reduce its overuse of the Colorado River ('I will enforce). Also, landscape ordinances now limit the type, amount, and location of grass areas in new developments to reduce overall water use and eliminate waste water flowing down the streets. Some water districts have implemented rebate programs for using artificial turf or other drought tolerant landscaping (New landscape). Gray water recycling systems have been required for new developments in certain cities. And finally Governor Schwarzenegger continues to push a \$10billion plan to build 2 new dams, expand a third reservoir, restore the Delta, and implement other water conservation strategies (Legislature debates).

Massachusetts has implemented a maximum withdrawal volume through the Massachusetts Water Management Act. According to this act, a single proprietor is only

allowed to withdrawal 100,000 gallons per day or 9,000,000 gallons per 3 months from any surface-water or groundwater (25. Water). Santa Fe, New Mexico has passed legislation restricting lawn watering as well as endorsing residents to decorate their yards with spray-painted artificial flowers (The Coming). The city of Orme, in rural Tennessee has been forced to take drastic measure to conserve water. In 2007, the mayor passed legislation allowing for the city's water supply to be turned off during the day and to be turned on at night for only 3 hours per day (Bigg, Matthew).

When looking at the state of Georgia specifically, there are many ways in which the state legislature has sought to conserve water. There is the Georgia Water Supply Act of 2008, in which DNR has the authority to build new water reservoirs throughout the state. Similar to this act is the Georgia Water Supply and Water Conservation Management Plan, which calls 5 new reservoirs and the expansion of 25 existing wastewater treatment facilities. This is a highly aggressive plan to fight the water conservation issue. Second, there is the Joint Comprehensive Water Plan Study Committee, which was established in 2001 to undertake a study of Georgia's water resources issues, develop a comprehensive water plan, and recommend a process and schedule to prepare details (Parker, Amy). Third, there is the Metropolitan North Georgia Water Planning District Water Supply and Water Conservation Effort, which was created in 2001 to promote intergovernmental coordination of all the water issues facing Georgia from both a regional and district perspective (District Background).

## **VII. Future Rules & Regulations**

This paper has previously outlined many different initiatives that have been implemented by both the state and federal government in areas that have experienced



water shortages for many a year. The remainder of the paper will outline what certain initiatives the state of Georgia should be considering in order to ensure its residents will have water in times of need.

Many times the first question arises as to whether or not a state or local jurisdiction should just completely stop growth until there is a certain amount of water readily available to the area. This action is a drastic and should only be employed under the direst circumstances. If a local government is to completely halt growth there will be many negative market backlashes resulting from this. The most obvious, development is a developer's lively hood and could result in many lost jobs to many people in the region. Also, if the supply and development of housing is halted then this will cause an increase in the cost of the existing housing stock to increase. Many jurisdictions already experience problems with shortage of affordable housing and this would only exasperate the problem.

Ultimately, land use regulations and other precautions need to be enacted so that this situation can be avoided. Land use regulations should be the main mechanism for urban growth management policies versus panicked water restrictions. While restrictions will be needed to aid in times of drought it is more important for a region to have a plan in place that projects its growth. This should be consistent with the amount of water a region has available. Limited capacity of local water supply sources can be used as a legitimate reason to slow urban growth, but land use decisions should be the vehicle for growth control.

There are several things Georgia should be looking at in order to help prevent a future water shortage from happening besides placing a moratorium on development. A couple

of ways to conserve water have been touched on previously: the use of grey water as well as incentives to install low-flow plumbing in older households. The latter is being enacted already by many regions in Georgia.

Tiered water pricing is already being enacted in Georgia and the Atlanta region, but has not seen the results that it was hoping for. Four years ago, metro Atlanta water planners urged utilities to discourage wasteful water use by raising the price charged to their customers. Planners urged utilities to set three different rates based on consumption-- the more water that was used, the higher the price. Since then, almost all of the 60+ utilities in the 16-county metro area have made changes to their water pricing; at the very least adopting a summer surcharge (Foskett, 2007). Unfortunately the new pricing structures have done little to reduce consumption—in many places an increase has even been seen.

So why has Atlanta not seen the change in water consumption as a result of the tiered pricing that many other states who have implemented the same thing have witnessed and what can be done to change this? In many areas the higher rates are not seen until a customer uses more than 20,000 gallons a month — nearly two and a half times the average indoor use (Foskett, 2007). And the higher rates are still low enough that the customers don't even notice an increase in their bill. And when the customer does reach an “excessive” level of water use their bill does not break this out—all the customer sees is a lump sum and is unaware, unless they notice their bill has increased slightly, that they are even being charged a higher price. Many Atlanta area city officials are however reviewing the rate structure to determine if the consumption thresholds for hitting higher rates are too high, or if the base rates are too low.

Also, Atlanta water users are accustomed to using water whenever and however they need it, and inexpensively. In many of the western states who also practice tiered pricing, water conservation has been an issue for many a year. The residents of these states are already in a conservation mindset that Atlantians haven't yet adopted; this mind-set goes hand in hand with conservation pricing. In order for this pricing to work it must be accompanied with a water conservation education process and conservation should continually be emphasized, not just in a time of drought.

Water metering should also accompany a tiered water pricing system. Someone does not know how much water they use in the month until a month later, which makes it very difficult for people to make rational and conscious decisions about their use on a day to day basis. Being able to monitor their daily use could help them realize when they are using water excessively and enables them to take action to reduce any unneeded use.

And there is a concept that takes tiered pricing a step further—this practice is known as budgeting water. “Budgeting Water” is used in many Western States where a shortage of water is a way of life. This model also uses tiers of consumption but the tiers are established on an individual family’s basis, taking into account the number of people living in the house and the size of their lot. This also helps to answer one issue many bring up when speaking of tiered pricing—water is a basic necessity of life and water must still be affordable to those larger, lower income families. This form of water budgeting would take into account this family size, so that the larger family is not given the same allocation of water consumption that the smaller household is.

In many of the western states that practice budgeting, the cost of water to the consumer is very low and affordable as long as they stay within the water budget that is

allocated to them. In Irvine California, once a household exceeds their budget, rates begin to double and can reach up to eight times the base rate (Raloff, 2000). In addition to this Irvine's water district gives each home an outdoor allocation that changes monthly based on what time of year it is and the weather for that month. The base rate to consumers is also cut by 25 percent if the household uses less than their allocation—this provides many incentives to the homeowner to monitor his water use.

The design alone of the water bill also gets the homeowner's attention—the bill tells the customer if their use is excessive. If the water use of a home has reached the top level, the top of the bill will read “wasteful”. These kinds of techniques and practices are something that the area of Atlanta should be considering to take tiered pricing one step further and to see the results that are needed.

In addition to this type of tiered pricing Atlanta has looked into the construction of new water resources. In the Atlanta area the development of new reservoirs is inevitable and unfortunately this is one of the main ways the Georgia general assembly will use to “fix” the drought. A dozen new water supply reservoirs are already underway in Georgia, seven of them in metro Atlanta. The total capacity for these reservoirs is more than 200 million gallons of water a day; enough water to supply the one million residents of the city of Atlanta and Fulton County. (Shelton, 2008) Most of these reservoirs that are being built and planned are small in comparison to the larger reservoirs that used to be built in the past. Lake Lanier covers about 38,000 acres while the new reservoirs will be somewhere between 150 to 800 acres (Shelton, 2008).

But the cost of these reservoirs is large. The land costs are so high and most land around the urbanized areas in need of new reservoirs is already highly developed. Even

with Georgia's help, the cost of constructing new reservoirs is quite expensive. The Hickory Log Creek reservoir, which will serve Cobb County, is costing more than \$100 million. This cost will for the most part be passed along to the consumer and paid for through tax payer money. This should be kept in mind as the Atlanta region looks to this type of construction for a quick fix to a problem that is not going to get better anytime soon.

The final suggestion for the Atlanta region would be to consider how a water marketing system could help ease restrictions in times of drought. California set up a water bank when they experienced a severe 5 year drought from 87-92. Because of this drought, the state began to look at an organized water marketing system and out of this was born the California Drought Water Bank established in 1991. The California Department of Water Resources was the broker; they purchased water from willing sellers and then would allocate/sell this water to people who are willing to purchase it. The DWR bought more than 800,000 acre-feet of water from willing sellers; half of the water came from farmers who agreed to be paid to not irrigate their land, the other half came from substituting pumped groundwater (26 percent) and from purchasing water in storage that would not normally be available for release (California Drought Persist, 1991).

The water-acre was purchased for \$125 an acre-foot. This price was based on what was estimated the farmers would have received by growing an average crop, plus an additional amount that was factored in to serve as an incentive to sell the water rights. Because of the time constraints and urgency of the situation the DWR was not able to secure commitments to match the amount of water they were purchasing, this resulted in

a mismatch between the amount of water purchased and the amount of water demanded/sold. Since this drought, California has set up a streamlined process so that in the event of another drought the system is in place to enact a water bank. Also since California enacted this bank many other states have followed their lead and set up systems such as this as well.

### **Conclusion**

In conclusion, it can be seen that there are many steps that can be taken to help Georgia prevent a water crisis from happening in the future. Most of the measures are preventative and must go hand-in-hand with a conservation mindset for the positive results to be seen. Water conservation is the most cost-effective and environmentally sound way to reduce our demand for water. This stretches our supplies farther, and protects our natural resources. The days of using water whenever and however we want are over and our state guidelines and regulations should not be afraid to stress this. The focus should now be on how to conserve water so that it is available for this generation as well as the generations that are to follow.

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