Whose Water Is It Anyway?

Comparing the Water Rights Frameworks of Arkansas, Oklahoma, Texas, New Mexico, Georgia, Alabama, and Florida

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Report to the Water Policy and Economics Team

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Table 3. Summary of Surface and Groundwater Allocation and Permitting in Alabama, Georgia, and Florida.

	Alabama	*Georgia*	*Florida*
State Agencies that manage water resources	Alabama Water Resources Commission and Alabama Department of Environmental Management	Environmental Protection Division	Florida Department of Environmental Protection and Five Water Management Districts
Water appropriation system	Riparian Rights Modified by Beneficial Use	Riparian Rights Modified by Beneficial Use	Hybridand/or
Climate/annual precipitation	Humid/48 - 67 inches	Humid 40 – 73 inches	Humid 39 – 52 inches
Quantity of surface water (mi^2)[1]	1,149 mi^2, 2.16% of total 53,178 mi^2	1,296 mi^2, 1.85% of total 69,899 mi^2	5,607 mi^2, 2.09% of total 268,697 mi^2	293 mi^2, 0.25% of total 121,590 mi^2
Who owns surface and/or ground water?	Public	Public	Public
Do riparian landowners need a permit to divert surface water?	Certificate of use if more than 100,000 gpd. Permit required in critical stress area.	Permit if more than 100,000 gpd	Yes, except for domestic use
Amount of surface water that may be diverted by riparian landowners	Only limited in critical stress area	Up to 100,000 gpd	Varies by district
Who receives water during a water shortage?	Domestic users	Domestic users followed by Agriculture. Priority of industry not affected.	Priorities set by water management districts
Numbers of years of non-use to lose permit. Duration of permit	None. Certificate of use valid for 5 to 10 years (renewable)	Two years for permit holders. No expiration for Agriculture after first use.10 to 50 years.	Two years. Up to 50 years
Meter required (surface or groundwater)	No	Only for Agriculture	Varies by water management district

1 U.S. Census Bureau, Statistical Abstract of the United States: 2011; Table 355 Land and Water Area of States and Other Entities: 2008.

Table 2. Summary of Groundwater Allocation and Permitting in Arkansas, Oklahoma, Texas, and New Mexico.

	Arkansas	*Oklahoma*	*Texas*	*New Mexico*
GROUND WATER RULES				
Flow meter required?	For non-riparian irrigation permits only	None	May be required in water master districts	Required in some water master districts
Owner of ground water	Landowners	Landowners	Landowners	Public
Permit required for domestic use?	No	No	No	Yes
Permit required for other purposes	No	Yes	No	Yes
Quantity of water that may be withdrawn	Amount needed for beneficial use; subject to the other competing users	Two-acre feet/acre owned unless a larger or smaller amount determined by OWRB based on groundwater basin characteristics	Unlimited except in designated conservation districts	Amount available and needed for beneficial use as determined by State Engineer

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"Whiskey is for drinking; water is for fighting over."
This quote has been attributed to Mark Twain, but until the attribution can be verified, the quote should not be regarded as authentic.[1]

Introduction

In most states surface waters, (streams, lakes, and coastal waters) are owned by the public. On the other hand, ground water may be privately or publicly owned. Because all waters are linked through the hydrologic cycle, and the hydrologic cycle is not confined within any geographic or political boundary, the question of ownership is generally replaced by one of who has the ***right to manage, divert, use, or sell the water***.

Water has a special place in our thinking because it is essential to life and a ubiquitous natural resource, like air. Its value and its ownership are generally not a concern unless it is in short supply, as in a drought. Historically, the right to use water from a stream or from a well only became a concern when one person took too much and deprived neighbors of their share, or one user polluted the water, making it unusable for others. These concerns are with us today virtually everywhere in the country.

The eastern U.S. (see Figure 1.) inherited a system of water rights from English Common Law. This approach could resolve water conflicts when population density was low and water was plentiful, but this system generally has come up short during drought or under pressure from population growth, irrigation, recreation, and industry.

States have addressed this problem in different ways through various approaches to water law and water rights. As demands grow due to population, climate change, and other factors, it is desirable for one state to learn from the experience of others to assure effective and fair allocation and sustainable use of their water resources.

In each of the states addressed in this study, "ownership" of surface waters is reserved for the public, but its use is defined by water rights

Figure 1. Legal systems for water rights are managed by the states. Most eastern states, where water is plentiful, have riparian systems, while western states, where water is more scarce, use prior appropriation systems.

1 Schmidt, B. Retrieved June 5, 2012, from Mark Twain Quotations, Newspaper Collections, & Related Resources: www.twainquotes.com

and the system of laws and permits that support them. "Water rights" refers to the right of users to take water from a water source and use it or sell it. In areas where there is plenty of water and low demand, there is not much controversy; but where demand is high, conflict over water can determine success or failure of agricultural enterprises, limit growth and development of cities, and determine profitability of industries.

Water law and water rights have generally evolved in two divergent directions, ***riparian doctrine*** and ***doctrine of prior appropriation***. Under riparian doctrine, water rights belong to those landowners whose land physically touches a river, pond, or lake. The doctrine of prior appropriation offers no benefit to riparian landowners. Prior appropriation may be paraphrased as, "first in time-first in right." Under this doctrine, the right to use the water is allocated (or appropriated) by a permit, and the first person permitted to divert water has priority over those who come later. So under prior appropriation, the water is publicly owned and the right to use it is administered by the state.

Under riparian doctrine the riparian landowner has a right to the water, with some limits. Generally, it may not be unreasonably detained or diverted. However, the definition of reasonable use varies from state to state. Riparian rights do not expire if the water is not used, and in most states, the right is transferred in the sale of land. Domestic use—a right of the riparian landowner—is usually limited to the quantity of water needed for a family, a garden, and in some cases grazing animals. Domestic use by riparian landowners is usually protected without issuance of a permit.

Under prior appropriation, the water use permit allows the user to divert a specific amount of water, at a certain location for a specified (beneficial) use. The permit has a definite date of priority. If there is not enough water to satisfy all permits, the earliest permit (senior water right) has priority over all later permit holders (junior water rights). In some states, appropriated rights may be sold or transferred separately from the land. Appropriated rights generally expire if they are not used within a specified period of time. This prevents an entity from locking up a resource or saving it for a later date. There is, however, no incentive for a senior permit holder to conserve water as they will get their water even when there is not enough to satisfy all permits.

Each state has adopted one of these frameworks or a combination framework. Generally eastern states are riparian and western states are prior appropriation in a progression that is predictable from their hydrologic balance from humid to arid (see Figure 1 and box—General Definitions). The water laws of Georgia, Alabama, and Arkansas are all based on riparian doctrine. Oklahoma and Texas are transition states, therefore have hybrid doctrine. New Mexico, the arid state in this study, uses prior appropriation. Florida, unlike its neighbors, has developed its own appropriative approach due to pressures from growing population, agriculture, and environmental concerns, even though it has very high rainfall and an abundance of both surface and ground water see Figure 2.)

So Who Owns the Water?

Under Riparian Doctrine, a landowner adjacent to a river or stream has the common law right to use the water, subject to ***Natural Flow Theory*** (see box—General Definitions). Unfortunately, most uses of water diminish the flow to some extent. Uses like irrigation, power production, and municipal water supply can overwhelm other uses such as recreation. When there is enough water to go around, this system works very well, but when users of riparian land increase their withdrawals, or when there is extreme drought, conflict is sure to arise.

Table 1. Summary of Surface Water Allocation and Permitting in Arkansas, Oklahoma, Texas, and New Mexico.

	Arkansas	*Oklahoma*	*Texas*	*New Mexico*
State Agencies that manage water resources	Arkansas Natural Resources Commission (ANRC)	Oklahoma Water Resource Board (OWRB)	Texas Commission on Environmental Quality (TCEQ)	Office of the State Engineer
Water appropriation system	Modified riparian doctrine	Hybrid doctrine	Hybrid doctrine	Doctrine of prior appropriation
Climate/annual precipitation	Humid/45 to 64 inches	Humid in east, arid in west/54 to 18 inches	Humid in east, arid in west/54 to 14 inches	Arid/12 to 20 inches; more in the mountains
Quantity of surface water (mi^2)[1]	1,149 mi^2, 2.16% of total 53,178 mi^2	1,296 mi^2, 1.85% of total 69,899 mi^2	5,607 mi^2, 2.09% of total 268,697 mi^2	293 mi^2, 0.25% of total 121,590 mi^2
Who owns surface water?	Public if navigable; riparian landowners if non-navigable	Public	Public	Public
Do riparian landowners need a permit to divert surface water?	No	Yes, except for domestic purposes	Yes, except for domestic purposes	Yes
Amount of surface water that may be diverted by riparian landowners	As much as needed, subject to the needs of other riparians	Amount appropriated by the OWRB	Amount appropriated by the TCEW	Amount appropriated the State Engineer
Who receives water during a water shortage?	Domestic users followed by registered riparian landowners	Domestic users followed by senior rights holders	Domestic users followed by senior rights holders	Senior rights holder
Numbers of years of non-use to lose permit	Riparian user-cannot lose right; non-riparian—two	Seven	Three	Four

1 U.S. Census Bureau, Statistical Abstracts of the United States: 2011; Table 335.

ic benefit, environmental projections, drainage, flood control and water storage, and water quality preservation. This is typically accomplished by setting a threshold for obtaining a permit.

Permits are generally issued for 20 years, although in some areas they are limited to five to seven years. Some municipalities or other entities using bonds to construct facilities can have permits extended up to 50 years. Permits are subject to forfeiture after two years of nonuse. Reporting requirements of the water usage are set by the water management district.

Interstate issues

The "tri-state water war" of Georgia, Alabama, and Florida is the fight for the limited water resources in the Chattahoochee, Flint, and Coosa Rivers. To meet its future demands, the City of Atlanta requested a 50 percent increase in withdrawals from the Chattahoochee and Flint basins by the year 2010. Alabama and Florida fought this proposal. Alabama has stated that the proposal would limit growth and increase the effects of pollution in Alabama. Florida has stated that the reduced flow would injure its oyster industry.

In 1992, the governors of these three states agreed to address interstate water issues cooperatively with a system-wide management plan. Basin-wide comprehensive studies of the Alabama-Coosa-Tallapoosa (ACT) and the Apalachicola-Chattahoochee-Flint (ACF) systems were completed in 1995 and have served as the foundation for subsequent interstate negotiations throughout following years.

Both Georgia and Alabama are riparian rights states, limiting their authority to impose restrictions. Georgia in particular is facing a growing water supply shortage. Efforts to gain access to water have taken several forms, including attempts at inter-basin transfers and state line disputes. Alabama has taken legislative action to prevent future inter-basin water transfers from the Tennessee River in an effort to prevent Georgia from gaining access to the Tennessee River. As of 2012, the tri-state water wars have not been resolved.

Summary

Water allocation regulations are summarized in Tables 1 through 3 of the Appendix. Even though there are many differences in the scope and enforcement of water laws and regulations, there are a couple of similarities. Specifically, small domestic users are exempt from many permitting requirements in the states with a history of riparian doctrine, and large users are subject to some restrictions or permitting. A general definition of large user is one who withdraws more than 100,000 gpd on average. All states have some stipulations for the government to protect the resource and assure reasonable and beneficial use of water.

The various formulations and implementations of water management systems in the eastern states stem from the same roots of riparian doctrine. This doctrine, however, offers little ability to meet the needs of water allocation in periods of water shortage. The western states (e.g. New Mexico) have their roots in a prior appropriation doctrine, a rational and efficient, though not necessarily fair, system for allocation of water rights in times of shortage. A drawback to the prior appropriation systems is its impediment to promoting water conservation, due to a "use it or lose it" provision. Of the eastern states in this study, only Florida has adopted an appropriative system that recognizes the interaction of surface and ground water and protects aquatic and riparian ecosystems.

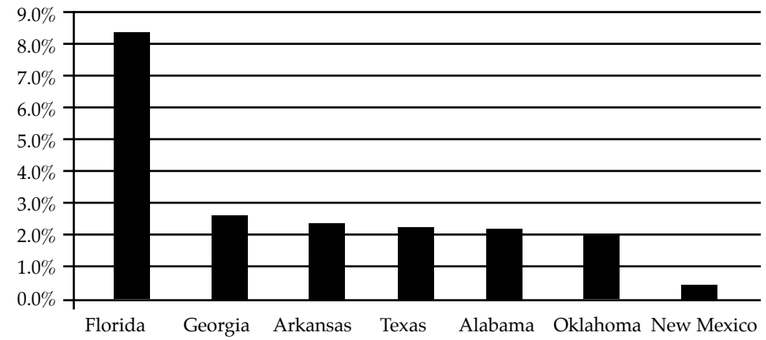

Figure 2. Percent of land surface covered by water.

General Definitions

Riparian Rights – A doctrine of water law that gives water rights to every person whose land touches a natural watercourse.

Prior Appropriation – A doctrine of water law that gives the right to use the water based on the date use began. It is a doctrine of "first in time, first in right."

Natural Flow Theory – The right of a riparian land owner to receive an undiminished and unaltered flow in the channel.

Doctrine of Reasonable Use – The right to use of water as long as it does not cause an unreasonable hardship or damage to other water users.

Acre-foot – the volume of water that can cover one acre to a depth of one foot (approximately 326,000 gallons).

Hydrologic Balance – the precipitation minus evaporative demand. A positive balance is termed "humid," a negative balance is termed "arid."

The two extremes in ability to handle water allocation are represented here by New Mexico (with a well-established prior appropriation system extending all the way back to the Spanish conquerors) and Alabama (with very limited management capability and a rudimentary permit system based on riparian doctrine). The following section details the water law frameworks and implementations of water rights in New Mexico, Oklahoma, Texas, Arkansas, Georgia, Alabama, and Florida.

New Mexico

New Mexico is an arid state (see box—General Definitions), which means evapotranspiration exceeds precipitation. It operates under a system of prior appropriation. All surface and ground water is publicly owned and subject to appropriation through permits, administered by the State Engineer.

There are four types of ground water permits: regular, temporary, livestock, and ***domestic use***. Most surface water and ground water is already appropriated, so most new water rights are for ground water.

New Mexico Definitions

Domestic Use - includes irrigation of one acre or less and water for drinking water and sanitation purposes.

Priority Date – the date of application for a water use permit.

Acequias – community operated irrigation canals recognized by state law. Some have priority dates back to the 16th centuries.

Priority Administration – the temporary curtailment of junior water rights in times of shortage.

Water Banks – a way to mitigate short-term shortages by the temporary re-allocation of water among bank participants without a formal water right transfer or change of ownership.

Domestic Well Management Area – A bounded area overlying a stream-connected aquifer that requires special water resource protection as determined by the state engineer.

To obtain a regular ground water permit for unallocated water, the user must show the water will be put to beneficial use, will not interfere with existing water right holders, and will not adversely affect public welfare and conservation. The state of New Mexico's water law fully recognizes the interaction between ground and surface water; so any proposed ground water permit must not interfere with surface water rights.

The date of application for a permit establishes its ***priority date***. If the State Engineer finds the application acceptable, a notice of intent must be published. If the application is protested, a hearing is held before the State Engineer. If the State Engineer finds the proposed water right will not interfere with other water rights and the water will be put to beneficial use, a "Certificate and License to Appropriate" is granted. The License may place specific conditions on the permit to protect existing water right holders.

Priority dates are very important because when there is not enough water to go around, senior water right holders have priority over junior water right holders, and some users can be cut off. Native Americans, ***acequias***, and agricultural water users typically have seniority while municipalities, industrial, residential, and recreational users are often junior water right holders. Although junior water rights can be curtailed in times of drought, more frequently, other means such as ***water banks*** are employed to transfer rights temporarily to high value uses.

A permit holder may sell the title to a permit or lease it for a period not to exceed ten years (unless it is to a municipality, in which case it may be leased for up to 40 years). A permit may be canceled if all conditions are not followed, or if it has not been put to use within a period of five years. If a permit is cancelled, the water becomes available for appropriation.

In 2004, the State Engineer launched the Active Water Resource Management (AWRM) initiative, which allows creation of water districts. Districts may have their own specific rules and regulations. They may appoint a water master, and they may require measuring and metering. Outside of water master districts, voluntary agreements may be employed for water sharing, water banking, and rotation.

Eminent domain may be used to gain access to private land to transfer water from its source to its destination.

An area may be declared a ***domestic well management area*** if the withdrawal of ground water is likely to affect existing surface water rights. This designation requires a public meeting before any new permits are issued, and a single household may be limited to 0.25 acre-feet per year. [In the other areas of New Mexico and

tricts (WMDs) implement the ***Water Use Permits***. Permit rules vary substantially from district to district, but there is very little difference in the rights of riparian versus non-riparian landowners. Diversion of surface water is limited to *reasonable and beneficial use*, and permit type is determined by the quantity of water specified. Diversion of water may be limited by MFLs, or minimum flows and levels of rivers, lakes, or aquifers, established for priority water bodies.

Ground waters and surface waters in Florida are considered to be publically owned, and water use permits are required based on withdrawal amounts (see box). Permit rules vary between WMDs and even between areas within WMDs. In some cases, metering of ground water withdrawals may also be required.

The Florida Department of Environmental Protection has general supervisory authority over the five water management districts. The Florida Department of Environmental Protection also has the ability to enter into inter-agency, inter-local and inter-state agreements, conduct surveys and research, and is the central information repository for the WMDs, local governments and other state and federal agencies. The Department of Environmental Protection is also responsible for publishing annually a bibliography of all water resource investigations conducted in the state and holding an annual conference on water resource development.[4]

Florida Water Use Permits (WUP)

Unless expressly exempted by law or District rule, a WUP must be obtained from the District prior to withdrawal of water if any of the following thresholds is exceeded:

(a) Total withdrawal capacity from any source or combined sources greater than or equal to 1,000,000 gallons per day (gpd),

(b) Annual average daily withdrawal from any source or combined sources greater than or equal to 100,000 gpd,

(c) The well's outside diameter is 6 inches or more at the surface, or

(d) Withdrawal is from a surface water body and the outside diameter of the withdrawal pipe or the sum of the outside diameters of the withdrawal pipes is 4 inches or greater.

Generally domestic use by individuals is exempt from permit requirements. Other exempted uses include firefighting, reuse of reclaimed potable water, and stormwater.

Out-of-basin transfers are allowed in Florida. The need to transport water based on "environmental, technical or economic reasons" is set forth in the policy of the Florida Water Resources Act. However, the law also stipulates that such transport is allowed only when the receiving area has exhausted all local sources, including "desalination, conservation, reuse of nonpotable reclaimed water and stormwater, and aquifer storage and recovery." The use of water from the nearest sources is encouraged, and conservation and proper utilization are main themes throughout the Water Resources Act.

The governing board of each WMD is charged with creating a regional district water management plan with at least a 20-year planning horizon, updated at least once every five years and issuing water use permits. The water management plan must include minimum flows and methods to establish minimum flows, and a district-wide water supply assessment that includes existing and future water use needs and conservation efforts. The water management plan must encompass the entire district and consider the maximum reasonable-beneficial use of the water resources, the maximum econom-

4 Florida Statutes (2011) 373.026.

ground water use require annual reporting. For those who held a valid permit before July 1, 2003, the State Soil and Water Conservation Commission is responsible for installing a meter, reading the meter, and reporting the measurements. For permits requested after December 31, 2002, the user must pay for the meter and report ground water withdrawal. No records of daily, or peak uses are required nor are records of irrigation or crop information reported.

Permits issued for agricultural water usage generally do not expire and can be transferred with the sale of the land, without the approval of the Department of Natural Resources. Agricultural permits in the Flint River Basin, however, are limited to a term of 25 years at the original permitted capacity "unless an evaluation of the water supply by the Division indicates that renewal at the original capacity would have unreasonable adverse effects upon other water uses."[2]

Approximately 21,000 agricultural water use permits have been issued (as of 2011), enough to irrigate 2.2 million acres. Only about 15,000 permits are actually used—enough to irrigate 1.4 million acres.

Competing Uses and Emergency Priorities

Georgia law establishes the following order of priorities for competing applications for water from a source that is insufficient to supply all applicants:

1. Emergency facilities
2. Domestic and personal use
3. Farm uses
4. Industrial use

2 (O.C.G.A. 12-5-31 (a)(3)).

The Environmental Protection Division is instructed to consider reasonable needs of the applicant and those to whom the water was being furnished as well as any unreasonable adverse effects upon other water users. Farm uses and perishable farm products have high priority. Permits are guaranteed for municipal and rural water supplies. For applicants with similar priority, preference is given to existing uses over new uses.

Any permit may be suspended or modified by emergency order of the Director of the Division due to water shortage. In the event of dire emergency, only water for domestic and personal uses and health-related activities will be permitted. Farm uses are given second priority.[3]

Inter-basin Transfers

Fourteen basins are delineated in Georgia. Diversion from one basin and discharge to another is allowed after the Director of the Environmental Protection Division considers competing uses that would not involve inter-basin transfer and pending applications. The permit to transfer water to another basin has lower priority than any other existing use.

Florida

Florida has a unique and complex two-tiered appropriation system to manage water use. Historically, Florida courts applied the doctrine of riparian rights to water rights cases, but all unexercised riparian rights were statutorily extinguished in 1974, two years after the passage of a comprehensive statutory permitting scheme in 1972.

The Florida Department of Environmental Protection manages the water on a state-wide level, but five regional Water Management Dis-

3 Georgia DNR Rules (2010) 391-3-6.

in other states, 2.0 to 3.0 acre-feet is a typical limit for domestic wells.] Further, the State Engineer may cancel any permit where the holder fails to comply with the conditions of the permit.

Temporary permits are available for prospecting, mining, construction of public works, construction of highways and roads, and drilling operations. Up to three acre-feet of water for up to one year may be granted if it will not permanently impair existing water rights. A separate permit is required for livestock water. Three acre-feet may be withdrawn yearly from each well, and wells must be spaced at least 50 feet apart.

Domestic use in new Mexico also requires a permit. If the well is for a single household, up to one acre-foot per year may be pumped. The maximum amount that may be withdrawn from a well serving three or more households is three acre-feet per year. A meter is required for wells that serve multiple households, for domestic wells in a domestic well management area, and for governmental, commercial, or non-profit facilities. Domestic wells receive a priority date and are subject to priority administration similar to other permits.

Oklahoma

Oklahoma is in the transition zone from arid to humid regions (see Figure 1 and box—General Definitions). Eastern Oklahoma receives about 54 inches of rain annually and has an adequate supply of surface water, but western Oklahoma is semi-arid, receiving only about 15 inches of rain annually. Before 1963, Oklahoma had a hybrid appropriation system for surface water, with both riparian and prior appropriation rights. In 1963, the Oklahoma Legislature applied the doctrine of prior appropriation, allowing the Oklahoma Water Resources Board (OWRB) to manage the state's waters. All individuals with stream water rights prior to 1963 were considered "vested" and were allowed

Oklahoma Definitions

Domestic Use – includes irrigation not to exceed three acres, watering of livestock up to the normal grazing capacity of the land, domestic animals, fire protection, and all household purposes. Water for domestic use may be stored in an amount not to exceed two years' supply.

Equal Proportionate Share – The annual amount of groundwater each permittee may withdraw from a groundwater basin. The amount is determined by the area of overlying land owned or leased by the permittee considering a minimum basin life of 20 years.

Sole Source Aquifer – Oklahoma has one designated sole source aquifer, the Arbuckle-Simpson aquifer in south central Oklahoma.

to continue to use their appropriated amounts. Ground water, on the other hand, was determined to be a property right. Nevertheless, ground water withdrawal may be limited by OWRB to allow each landowner an ***equal proportionate share*** (see box).

Surface Water

Any individual, corporation, or agency that wishes to use surface water in Oklahoma must obtain a permit from the OWRB. The only exception is for riparian landowners who use water for domestic use or diffuse water captured outside the cut bank of a definite stream.

When determining the amount of water available for appropriation from a stream, the OWRB considers the mean annual stream flow, existing domestic uses, and all other appropriations along with the designated purposes of

the stream system. The amount of water available for appropriation from a lake or reservoir is based on the 98 percent dependable yield for the reservoir for municipal and industrial use and 80 percent dependable yield for irrigation. Stream flow records are needed to determine the dependable yield.

There is no priority among uses of surface water as long as the uses are deemed beneficial (i.e. not wasted or polluted). Drinking water, irrigation water, and industrial uses all have the same priority. The date the OWRB receives an application is the priority date for the water permit. An applicant must make public his/her intent to appropriate, so anyone believing their interests will be affected can protest the issuance of a permit. The OWRB determines if a permit will be issued and may include conditions to protect existing rights and uses.

Oklahoma has five types of permits for stream water use: regular, seasonal, temporary, term, and provisional temporary. A provisional temporary permit is not renewable and does not require a hearing or approval by the OWRB. Once a regular permit is issued, the water must be put to use within two years, and the authorized amount fully used at least one year in seven thereafter. Thus, water rights cannot be locked up without using the water as permitted. Although annual reporting of water use is required, there is no requirement for metering.

When water shortages occur, domestic users have rights to the surface water first, followed by permittees according to their seniority. An application to transfer water out of a stream system (inter-basin transfer) can be considered after all needs are met within the stream system.

Ground Water

In Oklahoma, ground water is considered a private property right, and except in the case of a ***Sole Source Aquifer*** (see box), there is no consideration that surface and ground water may be connected when determining surface or ground water allocations.

Oklahoma ground water law, passed in 1972, allows landowners or lessees to obtain a permit from the OWRB to use ground water based on the number of acres of the applicant's land that overlies a ground water basin. A permit is not required for domestic use. The 1972 law determined that those individuals who already had water rights would be allowed to continue to withdraw their previously authorized amounts.

Where studies have not determined the amount of water in a ground water basin, temporary permits are issued, allowing withdrawal of up to 2 acre-feet per year per acre of land owned or leased by the applicant. If a hydrologic study has been done in the area, the permittee is allowed an ***equal proportionate share*** (see box) based on the amount that may be safely withdrawn, considering a minimum basin life of 20 years.

Texas

Texas is humid in the east and semi-arid in the west, with even greater extremes than Oklahoma. Surface water belongs to the public, but riparian landowners have the right to use stream water for domestic purposes without a permit. Ground water is a private property right, but Texas enables local management of ground water through formation of Ground Water Conservation Districts (GWCD).

Surface Water

Texas preserves the right of landowners to impound up to 200 acre-feet of water in a stock tank on their property without a permit. Permits are also not required for emergency use in fire-fighting, drilling for oil, shrimp and fish farming, or sediment controls in surface coal mining.

the Alabama Water Resources Act also provides a state-wide procedure to handle other aspects of water management including state response to emergencies such as floods and droughts, and a unified voice for the state when dealing with interstate water issues.

Water rights for small quantities are generally not quantified, and historically no public records were kept. The database of water usage now consists of the annual self-reported data from the large withdrawers.

Ground Water

Ground water is covered under the Alabama Water Resources Act, but historically Alabama courts have used a mixture of reasonable use, nuisance, and absolute ownership theories. At times, the Alabama Supreme Court has declared that one theory applies, while actually using the analysis and reasoning of another theory. In later cases, reasonable use theory seemed to emerge as the state courts' preferred methodology.

Georgia

Georgia is a riparian rights state, limited by beneficial use. Water is managed by the Georgia Environmental Protection Division of the Department of Natural Resources as mandated in the Georgia Water Pollution Control Act, which sets forth that:

> *"…all waters of the state are basic resources that should be conserved and managed for maximum benefit of the people, and subject to reasonable usage. This beneficial use should not be restricted unless the existing or future water usage in an area exceeds the supply capacity or during an emergency water shortage. If restrictions are necessary, then human consumption would be the priority use, followed by agricultural and industrial usage as second priorities."*[1]

1 Official Georgia Code Annotated. Section 12-5-20 (2012).

Surface Water and Ground Water

The Georgia Environmental Protection Division of the Georgia Department of Natural Resources issues permits for withdrawal, diversion and impoundment of surface and ground waters for large users. No permit is required for:

- diversion or withdrawal smaller than 100,000 gallons per day on a monthly average;
- diversion that does not reduce the flow of surface waters where it leaves the property by more than 100,000 gallons per day on a monthly average;
- diversion for construction for transportation purposes that does not reduce the flow of surface waters by more than 150,000 gallons per day on a monthly average;
- impoundment that does not reduce the flow of surface waters immediately downstream of the impoundment by more than 100,000 gallons per day on a monthly average,
- impoundment of water in a farm pond, constructed for the sole purpose of fish, wildlife, recreation, or other farm uses.

No permit is required for the reduction of flow during construction or initial filling of an impoundment.

Permits are generally issued for 10 to 20 years, but can be extended up to 50 years for municipalities or other entities issuing bonds to construct facilities. Permit holders are required to report annually the average monthly and maximum daily use of water to the Georgia Environmental Protection Division.

Agricultural Water Use Permitting

Agricultural permits in Georgia are based on pumping capacity and fall under different requirements based on the date of application. All those requested after December 1, 1999 for

in the Grand Prairie Area in Eastern Arkansas were designated critical regions in 1996 and 1998, respectively. Although the critical regions are not regulated, there are tax incentives for water conservation practices.

A law passed in 2001 identified the Sparta, Memphis, Cockfield, Cane River, Carrizo, Wilcox, Nacatoch, Roubidoux, and Gunter formations as ***sustaining aquifers*** (see box) and mandated that any wells withdrawing water from them must have a properly functioning metering device. Domestic wells were exempt.

Alabama

Alabama, like most humid region states, is a riparian rights state limited by beneficial use. Water is managed by the Alabama Water Resources Act, which sets forth that:

> *…waters of the state are a basic resource that should be conserved and managed for "full beneficial use… (and) not be restricted unless the existing or future water usage in an area exceeds the supply capacity." If restrictions are necessary, then human consumption is the priority.*

The Water Resource Commission and the Office of Water Resources in the Alabama Department of Economic and Community Affairs (ADECA) were created by the Water Resources Act to oversee and administer a water use reporting system.

The Water Resources Commission has the specific authority to designate stress capacity areas, based on a study finding that the area will not have enough water supply capacity for current or future usage. But the Act specifically limits the Commission's authority to restrict water use otherwise. Further, this authority does not apply to any impoundment contained completely upon the property of a person if it is identified in a certificate of use.

Surface and Ground Water

Water use reporting is required for large users (100,000 gallons per day or more) under their ***certificate of use*** (see box). Certificates of use are generally issued for five to ten years and are renewable. If the terms of the certificate of use are not followed, or if a water user violates the Water Sources Act, the certificate of use can be modified or terminated.

Besides the goal of providing a comprehensive water resources framework for water usage,

Alabama Certificate of Beneficial Use

The certificate is a declaration of the following for each point of withdrawal:

- water source;
- primary use of the water;
- location of the points of diversion and return flow to the water source;
- estimated or actual quantity of water withdrawn;
- estimated or actual quantity of water in the return flow to the water source;
- estimated maximum that could be withdrawn;
- estimated maximum that could be returned to the water source;
- method of measuring, estimating or controlling the flow;
- a statement if the source of water is considered navigable;
- a statement of the this will be a lawful, reasonable and beneficial use of the water;
- the water use is consistent with the public interest;
- the water use does not interfere with any other legal use at the time of the declaration; and
- the water use complies with the provisions of the Alabama Water Resources Act.

Permitting authority resides in the Texas Commission on Environmental Quality (TCEQ). In 1967, the Texas Legislature decreed that the doctrine of prior appropriation would prevail in Texas. Subsequently, the state courts looked over all claims and issued certificates of adjudication with priority dates for each approved claim. Some existing claims received perpetual rights, and others received limited-term rights. Virtually all surface waters are currently appropriated, and in some cases over-appropriated. If a permitted use of appropriated water is abandoned for three consecutive years, the water right is forfeit and becomes available for appropriation.

Limited term and temporary permits may be issued even in basins where all the water is fully appropriated, if some is not currently in use. But such limited-term rights are the first to lose access when water is in short supply. Term permits to industries, mines, and agricultural enterprises are usually issued for 10 years and may be renewed if other water-right holders are still not using the water. Temporary permits are issued for up to three years for road construction, mining and irrigation.

Texas Groundwater Management Districts (GMA)

A GMA is a geographical area suitable for the management of ground water resources. There are currently 16 GMAs (2012).

An area that is expected to experience problems such as water shortages or contamination can be designated a priority ground water management area, or PGMA, by the TCEQ.

If designated a PGMA, the people living there must form or be annexed into a Ground Water Conservation District (GCD) within two years. A GCD has authority to regulate well spacing and pumping and implement management plans to conserve and protect ground water resources.

An appropriator may use eminent domain to gain access to private property for right-of-way to pump their water to where it is needed. If the party wanting such easements is not a corporation, district, city, or town, he/she must apply to the TCEQ.

Texas law establishes a priority for surface water rights. Domestic and municipal uses are first, followed by agriculture and industry, mining, hydroelectric power, navigation, and recreation. When there is a water shortage, domestic use receives first priority followed by permits according to their priority dates. The senior right holders have the right to their water before all junior right holders.

Administration of the water allocation system is generally based on an honor system, but in some cases the TCEQ may appoint a ***watermaster*** to enforce the rules. If the watermaster finds that someone is diverting water that is not theirs, he/she has the authority to lock pumps.

Ground Water

Unlike surface water, which is state owned, the right to use ground water belongs to the owner of the land. No permit is required throughout much of the state, where one may withdraw as much water as needed for any reason. This is called the ***rule of capture***; basically the deepest wells and biggest pumps may deplete an aquifer as nearby, shallower wells go dry.

Texas statute also recognizes the authority of the state to conserve and protect natural resources, including ground water. This has led to the formation of ***Ground water Management Areas (GMAs)*** and Ground water Conservation Districts, or GCDs (see box).

Current Texas Supreme Court rulings stand by the rule of capture, but courts have imposed some limits. For example, water must not be wasted, pumped just to harm a nearby neighbor, or pumped from a slant (i.e. a drilled well that crosses into someone else's property). Texas statute also restricts pumping of water from the underflow of a river, from an aquifer within the jurisdiction of a GCD, or from the Edwards Aquifer within the jurisdiction of the Edwards Aquifer Authority.

Arkansas

Arkansas is in the humid region of the U.S. (see Figure 1 and box—General Definitions). It has a large number of lakes and rivers and historically has had few periods of water shortage. Like most eastern states, it recognizes the riparian doctrine as the basis for water law.

Surface Water

Arkansas distinguishes between publicly owned ***navigable waterways*** (see box) and privately owned non-navigable waterways that are owned by riparian landowners.

Riparian landowners may use all of the water they need from the adjacent source, but must limit their use if all riparian needs cannot be met. A riparian landowner who wishes to divert more than 325,900 gallons (1 acre-foot) in any given year, must register with the Arkansas Natural Resource Commission (ANRC). Failure to register is subject to penalty. Riparian rights may not be sold apart from the land

A non-riparian landowner may apply for a permit to divert water if there is ***excess water*** (see box). Based on the estimation procedure specified in Arkansas statute, Arkansas has more than 10 million acre-feet of excess water.

Before a non-riparian application is considered, the applicant must show proof that he/she has leased or has received permission from a riparian landowner to form an easement. The Director determines if the proposed water is excess water, and if it is intended for a reasonable and ***beneficial use*** (see box—Arkansas Definitions). The Director may grant the permit and place conditions such as restricting withdrawal to certain seasons. A non-riparian landowner may lose his/her permit if any condition of the permit is violated or if the water is not put to use within two years from the date of issuance. The applicant for a water permit has the right to protest the action of the Director in either granting or canceling a permit. Permits may be issued for periods up to 50 years.

Arkansas Definitions

Navigable Waterways – A waterway that could sustain commercial navigation at the time of statehood. Due to the Arkansas Supreme Court ruling in 1980, streams that are capable of being boated may be considered public waterways if they are navigable by small boats for at least six months a year or they have a long history of public recreational use.

Excess Water – Twenty-five percent of the average annual yield from any watershed above that amount, as determined by the Commission, required to satisfy all of the following: riparian and non-riparian usage, water needs of federal water projects, firm yield of all affected reservoirs, maintenance of minimum stream flows for certain, and future water needs of the watershed as projected in the Arkansas Water Plan.

Beneficial Use – Uses of water in such quantity as is economical and efficient, and used for a purpose and in a manner which is reasonable, not wasteful, and compatible with public interest.

Intra-basin and Inter-basin Transfer – The transfer of water within or between basins. Five basins are defined: Arkansas River, Mississippi Delta, Ouachita River, Red River, and White River.

Sustaining Aquifer – Any aquifer, excluding the state's alluvial aquifers, which is used as a significant source of water supply.

The following uses of water are permitted without allocation: annual diversions of less than 1 acre-foot, irrigation tailwater, exclusively owned water, diffused surface water, captured water, and water for non-consumptive usage.

The application processes for intra- and inter-basin transfers are similar, except that inter-basin transfer requires the ANRC to hold a hearing with public notice. Permits for both ***intra- and inter-basin transfers*** may be bought and sold unless the permit is for irrigation. Permits for irrigation require installation of flow-metering devices to measure the amount of water diverted.

Interstate transfer or sale of water (except bottled water) requires a process similar to the intra and inter-basin transfer, however that the Arkansas General Assembly must approve the permit after the ANRC evaluates: (1) water availability in Arkansas and in the state to where it will be sold, (2) the present and future water demands of water users in Arkansas, (3) whether there are water shortages in Arkansas, (4) whether the water to be transported could be used to alleviate water shortages within Arkansas, and (5) the demands placed upon the applicant's supply in the state of intended use. If the ANRC recommends the transfer of water, it will recommend a price to be paid to the state of Arkansas.

The ANRC has developed a system of priorities for water allocation during periods of water shortage. Domestic and municipal use, minimum stream flow, and federal reserved rights must first be met. Once these needs are met, there is an allocation hierarchy that gives first priority to riparian landowners involved in agriculture, followed by industry, hydropower, and recreation. Next preference is given to riparian landowners who are not registered but have used the water before, followed by non-riparian intra-basin transfers, and then non-riparian inter-basin transfers. At the bottom of the list and the first that must decrease or cease diversions are out of state transfers and riparian landowners who have never used the water.

Interstate stream compacts are intended to resolve and prevent disputes over waters shared with neighboring states and to assure the receipt of adequate surface flows and releases from upstream states. These compacts also deal with water quality and pollution problems. Arkansas has two interstate compacts, the Arkansas River Compact with Oklahoma and the Red River Compact with Oklahoma, Texas, and Louisiana.

Ground Water

Arkansas landowners have a right to withdraw ground water from underlying aquifers without limit as long as the water is put to beneficial use. This right cannot be sold separately from the land. Registration is required for wells with a maximum flow rate greater than 50,000 gallons per day.

Even though Arkansas has a lot of surface water, 63 percent of the water utilized comes from ground water. In 2005 there were almost 55,000 registered wells reported, 98 percent designated for irrigation. In some areas, the ground water is being withdrawn faster than it can be recharged, resulting in declining levels. If an aquifer is affected by over pumping, the ANRC may list it as critical. Consequently, a five-county area of the Sparta Aquifer in Southern Arkansas and the alluvial and Sparta/Memphis aquifers