OWNING GROUNDWATER: THE EXAMPLE OF MISSISSIPPI V. TENNESSEE

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In *Mississippi v. Tennessee*, Mississippi claims that it owns all groundwater stored underneath its borders that does not cross into Tennessee under "natural predevelopment" conditions—those existing before the advent of modern well technology. Consequently, Mississippi seeks more than six hundred million dollars from Tennessee for its pumping of wells that tap into a geologic formation that underlies both states. This remarkable claim departs from the almost uniformly established proposition that states do not "own" the water within their borders, but instead are authorized to manage that water for the "use" of their citizens. It also departs from the U.S. Supreme Court doctrine of "equitable apportionment" under which the Court has resolved interstate surface water conflicts, determining relative rights of use rather than awarding monetary damages based on water ownership. This Article situates the conflict at the crossroads of two broader issues. First, under a phenomenon this Article dubs "groundwater exceptionalism," the law often treats groundwater differently than surface water, partly as a relic of slow-developing hydrologic knowledge. Second, the dispute goes to the very heart of property law and the meaning of ownership, as distinguished from rights of use. The lower courts have consistently framed this decade-long dispute as a matter of competing uses, but have also interjected the rhetoric of ownership into their opinions. This conflation of use and ownership has the potential to affect the outcome of this case, as well as distort future litigation involving equitable apportionment, regulatory takings, state water rights law, and other legal doctrines.

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I. INTRODUCTION

Can water be owned? For water on Earth's surface, U.S. law has settled, albeit with some equivocation, on the position that one can hold legal rights to "use" water, but not "own" it. This is the view embraced by most commentators and also by the courts in the relatively rare cases

where the legal issue arises directly.[1] But the rhetoric of ownership is alluring, and it periodically infiltrates judicial opinions or legal briefs, clouding the divide between ownership and rights of use.[2] No similar consensus exists for groundwater—the water found beneath the earth's surface in the cracks and pores of soil, sand, and rock.[3] Often, the law treats groundwater differently than surface water, a phenomenon this Article dubs *groundwater exceptionalism*.[4] The aquatic version of exceptionalism posits that groundwater does not follow the same physical patterns as surface water, and therefore should not be subject to the same legal constraints. As a practical matter, this special treatment of groundwater makes it less susceptible to regulation and to the norm of principled sharing among competing users, and more prone to broad claims of exclusive ownership. This exceptionalism manifests, at times, through suggestions that groundwater is subject to ownership by states or landowners, even if surface water is not.[5]

A number of legal doctrines have flirted with groundwater exceptionalism, including the regulatory takings doctrine and state water rights law.[6] More recently, the specter of exceptionalism has shaped a long-running fight between Mississippi and Tennessee over the groundwater stored in an aquifer that lies beneath both states.[7] This litigation provides a high-stakes opportunity for the U.S. Supreme Court to either accept or reject groundwater exceptionalism in the context of yet another legal doctrine—equitable apportionment (the federal common law doctrine under which the U.S. Supreme Court allocates the right to use an interstate water source among competing states).[8] To date, the Court has apportioned only three rivers: the Delaware River,[9] the Laramie

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1 *See infra* Part IV.

2 *See infra* Parts II.C and II.D.

3 *See generally* U.S. GEOLOGICAL SURVEY, OPEN FILE REPORT 93-643, WHAT IS GROUND WATER?, https://pubs.usgs.gov/of/1993/ofr93-643/ (defining groundwater and discussing its properties).

4 *See infra* Part II.B.

5 *See infra* Part II.A.

6 *See infra* Part IV.

7 Aquifers are underground geologic formations made up of materials including sand, gravel, limestone, and fractured rocks capable of storing usable volumes of water. U.S. GEOLOGICAL SURVEY, *supra* note 3.

8 *See infra* Part II.C.4.

9 *See* New Jersey v. New York, 347 U.S. 995 (1954) (modifying and amending 1931 decree); New Jersey v. New York, 345 U.S. 369 (1953); New Jersey v. New York, 283 U.S. 336 (1931) (apportionment).

River,[10] and the North Platte River.[11] Instead, the Court prefers that the states resolve their differences by negotiated agreements approved by Congress.[12] In addition, the Court has granted leave to file complaints in disputes concerning the apportionment of six additional rivers: the Apalachicola River,[13] the Arkansas River,[14] the Catawba River,[15] the Connecticut River,[16] the Vermejo River,[17] and the Walla Walla River.[18] For a variety of reasons, the litigation did not proceed to a final judgment of apportionment in these six cases.

In *Mississippi v. Tennessee*, an original action filed before the U.S. Supreme Court, Mississippi claims that it owns all groundwater stored underneath its territory that would not have crossed into neighboring Tennessee prior to the advent of modern well technology, so-called "natural predevelopment" conditions.[19] Mississippi complains of excessive groundwater pumping by wells drilled on Tennessee's side of the border, seeking hundreds of millions of dollars in damages and declaratory relief under common law claims including conversion and trespass. Of particular importance is Mississippi's explicit rejection of equitable apportionment as a remedy: Mississippi contends that the disputed groundwater should be distinguished legally and factually from the interstate *surface* waters the U.S. Supreme Court has historically allocated through equitable apportionment.[20] Referring to surface water,

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[10] *See* Wyoming v. Colorado, 353 U.S. 953 (1957); Wyoming v. Colorado, 309 U.S. 572 (1940); Wyoming v. Colorado, 298 U.S. 573 (1936); Wyoming v. Colorado, 286 U.S. 494 (1932); Wyoming v. Colorado, 260 U.S. 1 (1922) (correcting error in 1922 decree); and Wyoming v. Colorado, 259 U.S. 419 (1922) (apportionment).

[11] *See* Nebraska v. Wyoming, 534 U.S. 40 (2001); Nebraska v. Wyoming, 515 U.S. 1 (1995); Nebraska v. Wyoming, 507 U.S. 584 (1993); Nebraska v. Wyoming, 345 U.S. 981 (1953); Nebraska v. Wyoming, 325 U.S. 665 (1945); Nebraska v. Wyoming, 325 U.S. 589 (1945) (apportionment); Nebraska v. Wyoming, 295 U.S. 40 (1935).

[12] *See infra* notes 41–43 and accompanying text.

[13] Complaint for Equitable Apportionment and Injunctive Relief at 5–6, Docket No. 1, *Florida v. Georgia*, Nov. 3, 2014, *available at* http://www.pierceatwood.com/floridavgeorgia142original.

[14] Colorado v. Kansas, 322 U.S. 708 (1944); Colorado v. Kansas, 320 U.S. 383 (1943); Kansas v. Colorado, 206 U.S. 46 (1907); and Kansas v. Colorado, 185 U.S. 125 (1902).

[15] South Carolina v. North Carolina, 562 U.S. 1126 (2010), *dismissing* South Carolina v. North Carolina, 558 U.S. 256 (2010); South Carolina v. North Carolina, 552 U.S. 804 (2007).

[16] Connecticut v. Massachusetts, 283 U.S. 789 (1931); Connecticut v. Massachusetts, 282 U.S. 660 (1931).

[17] Colorado v. New Mexico, 467 U.S. 310 (1984); Colorado v. New Mexico, 459 U.S. 176 (1982).

[18] Washington v. Oregon, 297 U.S. 517 (1936).

[19] *See infra* notes 69–74 and accompanying text.

[20] The State of Mississippi's Motion for Leave to File Bill of Complaint in Original Action, Complaint, and Brief in Support of Motion at 15, Mississippi v. Tennessee, No. 143 (U.S. June 6, 2014), http://www.ca6.uscourts.gov/special-master [hereinafter Complaint, *Mississippi v. Tennessee*] ("Thus, this action presents a different factual and legal situation from the shared interstate river or stream disputes resolved under the Court's original and exclusive jurisdiction

the Court has previously asserted: "The claim that on interstate streams the upper State has such ownership of the whole stream as entitles it to divert all the water, regardless of any injury or prejudice to the lower State . . . has been consistently denied."[21] Rather, states along an interstate watercourse hold competing interests that "must be reconciled as best they may."[22] Mississippi seeks to except groundwater from this general principle in what could become the U.S. Supreme Court's first groundwater equitable apportionment case.[23]

This Article situates the *Mississippi* conflict at the crossroads of groundwater exceptionalism and property law. Part II examines the *Mississippi v. Tennessee* litigation, focusing on the language of the litigation record to discern the extent to which the courts and the parties have explicitly or implicitly embraced groundwater exceptionalism. Part III places the *Mississippi* litigation into the broader context of property law, and highlights the subtle distinction between full ownership rights and nonpossessory rights of use. As every first-year law student learns, "ownership" is a word in search of a meaning. It is a broad placeholder, but in isolation, it raises more questions than it answers. What sticks are in any particular ownership bundle? What human relations does it implicate? What is the nature of the thing that is owned? Finally, Part IV reveals why it matters whether courts validate claims of water ownership by states and private parties. It also demonstrates the dangers of conflating the concepts of ownership and use.

This Article concludes with a warning for future phases of the *Mississippi* litigation. Although the lower courts have consistently framed this fight in terms of competing uses, they have also interjected the rhetoric of ownership into their opinions.[24] This Article does *not* take a position on whether Tennessee is withdrawing too much water from the aquifer upon which Mississippi also relies. But it does argue that cloaking interstate water disputes in the language of ownership is inconsistent with past precedent and is unhelpful in resolving conflicts.[25] The substitution of "ownership" for "use" could taint the analysis in this case, and distort

through 'equitable apportionment,' where opposing states have co-equal ownership and rights to use water traversing and freely flowing across two or more states under natural conditions."). *See also infra* notes 134–35 and accompanying text.

21 Hinderlider v. La Plata River & Cherry Creek Ditch Co., 304 U.S. 92, 108 (1938) (explaining that states possess "the right only to an equitable share of the water" in an interstate stream).

22 *Id.* at 103 (quoting New Jersey v. New York, 283 U.S. 336, 342–43 (1931)).

23 *See infra* Part II.C.4.

24 *See* infra Parts II.C and II.D.

25 *See infra* Part II.

future litigation in areas including equitable apportionment, the regulatory takings doctrine, and state water law.[26]

II. MISSISSIPPI V. TENNESSEE

This Part begins with an overview of the litigation between Mississippi and Tennessee, highlighting the plaintiff's claim that it "owns" at least a portion of the groundwater lying within the interstate aquifer, and therefore has the right to damages and/or injunctive relief against Tennessee for pumping from the same aquifer. Following a brief explanation of the physics of water, the analysis then dissects the parties' and courts' language to determine the impact of groundwater exceptionalism on the litigation. The analysis concludes by noting that although the courts have generally rejected special treatment of the disputed groundwater, instead suggesting that Mississippi must share the aquifer's water with Tennessee as it would interstate surface water, this rejection has been equivocal.

A. The Claim—Owning Groundwater

Memphis lies in the southwestern corner of Tennessee, just north of the Tennessee-Mississippi border. It sits above an interstate water-bearing geological formation, the Memphis Sand Aquifer, which is largely fed by the Sparta Sand Aquifer.[27] Memphis relies heavily on these aquifers (referred to herein as the "Memphis-Sparta Aquifer" or "Aquifer") for the city's water supply. In fact, Memphis is one of the world's largest cities to depend exclusively on artesian groundwater for its municipal uses.[28] The Aquifer's water has been described as the "sweetest, most wonderful tasting water in the world," and it requires

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[26] *See infra* Part IV.

[27] The parties do not dispute that the Sparta Sand formation lies beneath both Mississippi and Tennessee, and that it provides a large part of the water supply of the Memphis Sand Aquifer tapped by Memphis' wells. Memorandum of Decision on Tennessee's Motion to Dismiss, Memphis and Memphis Light, Gas & Water Division's Motion to Dismiss, and Mississippi's Motion to Exclude at 32, Mississippi v. Tennessee, No. 143 (U.S. Aug. 12, 2016), http://www.ca6.uscourts.gov/special-master [hereinafter Special Master's Memorandum, *Mississippi v. Tennessee*].

[28] Complaint, Hood *ex rel.* Mississippi v. City of Memphis at *4, 533 F. Supp. 2d 646 (N.D. Miss. 2008) (No. 2:05CV32-D-B), 2005 WL 1183677 [hereinafter Complaint, *Hood v. Memphis*] (alleging, "the City of Memphis is the largest city in the world that relies solely on artesian water wells for its water supply, despite the close proximity and availability of an adequate alternative source of supply from the nearby Mississippi River"); WATERWORLD, *Memphis Water Termed "Sweetest in the World"*, http://www.waterworld.com/articles/print/volume-19/issue-11/washington-update/memphis-water-termed-sweetest-in-the-world.html (quoting Dr. Jerry L. Anderson, Director, Ground Water Institute, University of Memphis).

relatively little treatment prior to use.[29] As a result, it provides an inexpensive source of water for the city. By some estimates, Memphis residential customers pay less than one-third of what it would cost if the city relied instead on the nearby Mississippi River.[30] Tennessee is not the only state that overlies the Aquifer, which extends beneath portions of other states including Alabama, Arkansas, Louisiana, Mississippi, and Texas.[31]

Over time, Memphis increased its groundwater pumping. According to Mississippi, between 1965 and 1985 pumping nearly doubled.[32] Moreover, Memphis developed new well fields within three miles of the Mississippi state line.[33] In 2005, Mississippi filed suit against the City of Memphis and its municipal utility company, Memphis Light, Gas & Water Division ("MLGW"),[34] claiming that the defendants (collectively, "Memphis") unreasonably and unlawfully diverted groundwater from beneath Mississippi's territory. Importantly, Mississippi did not allege that Memphis' wells themselves had been drilled on Mississippi soil. Instead, Mississippi complained that the wells siphoned groundwater away from Mississippi and toward Memphis, creating an hydraulic feature known as a "cone of depression" that changed the natural flow direction within the Aquifer.[35] Mississippi argued that Memphis' pumping pulled Aquifer water "uphill" and "northward from Mississippi across the State line into Memphis' wells."[36] The plaintiff claimed that over time Memphis had diverted billions of gallons of groundwater from Mississippi, and it sought declaratory and injunctive relief, and hundreds of millions of dollars in damages.[37]

At the heart of Mississippi's lawsuit is the notion that it owns the water resources of the state, including the groundwater beneath its territory.[38]

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29 WATERWORLD, *supra.* note 28.

30 *Id.*

31 U.S. GEOLOGICAL SURVEY, THE SPARTA AQUIFER: A SUSTAINABLE WATER RESOURCE, Fact Sheet 111-02 (Nov. 2004), https://pubs.usgs.gov/fs/fs-111-02/.

32 Complaint, *Mississippi v. Tennessee*, *supra* note 20, at 7–8.

33 *Id.*

34 Complaint, *Hood v. Memphis*, *supra* note 28.

35 *Id.* at 19.

36 *Id.* at 18.

37 First Amended Complaint, Hood *ex rel.* Mississippi v. City of Memphis, at *5–6, 533 F. Supp. 2d 646 (N.D. Miss. 2008) (No. 2:05CV0032), 2006 WL 3853655 [hereinafter First Amended Complaint, *Hood v. Memphis*].

38 *Id.* at *1–2 (alleging Mississippi "owns the water resources of the State"); Plaintiff's Reply Memorandum of Authorities in Support of Plaintiff's Response in Opposition to Defendants' Motion for Partial Summary Judgment re: Conversion at *1–2, 533 F. Supp. 2d 646 (N.D. Miss. 2008) (No. 2:05CV32-D-B), 2007 WL 4673341 [hereinafter Plaintiff's Reply Memorandum, *Hood v. Memphis*] (asserting that Mississippi "owns all of the surface and ground water resources of the State as a matter of law").

In particular, Mississippi claims that title to the underlying groundwater vested exclusively in the state in 1817, the year that Mississippi achieved statehood.[39] Mississippi relied on this sovereign ownership theory to deny that it has an obligation to share the Aquifer's water with neighboring Tennessee, and to support its claims of conversion, trespass, and nuisance.[40]

B. The Temptation—Groundwater Exceptionalism

All water on Earth is intimately bound into a single hydrologic cycle. Yet, a number of physical characteristics set groundwater apart: its invisibility from above ground, its glacial rates of flow through some aquifers, its relatively high quality, and its often easy accessibility to overlying landowners who may be far from a river or other surface supply of water. This tension between the similarities and differences of surface water and groundwater strains the law and pulls it in opposite directions—sometimes calling for uniform treatment of water and, at other times, presenting the temptation to subject groundwater to exceptional treatment.

Mississippi called for such special treatment by claiming to own the contested groundwater, rather than by seeking to resolve the dispute by one of the methods routinely used in surface water disputes. Typically, feuding states attempt to resolve their differences by negotiating an interstate agreement known as a compact,[41] which requires congressional approval under Article I, § 10 of the Constitution.[42] Alternatively, states can invoke the original jurisdiction of the U.S. Supreme Court and seek an "equitable apportionment" under federal common law.[43] Eschewing these methods, Mississippi instead relies on an ownership-based theory unique to groundwater.

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39 Plaintiff's Reply Memorandum, *Hood v. Memphis*, *supra* note 38, at *2.

40 First Amended Complaint, *Hood v. Memphis*, *supra* note 37, at *9–15.

41 DAVID H. GETCHES, WATER LAW IN A NUTSHELL 438–44 (4th ed. 2009). Mississippi alleges that Tennessee rebuffed its overtures to reach some sort of a negotiated settlement. Complaint, *Mississippi v. Tennessee*, *supra* note 20, at 13.

42 U.S. CONST., art. I, § 10 ("No state shall, without the consent of Congress . . . enter into any agreement or compact with another state, or with a foreign power . . . .").

43 GETCHES, *supra* note 41, at 433–38. U.S. CONST., art. III, § 2 (grants the Court original jurisdiction over "controversies between two or more states"). In theory, states can also seek an allocation by Congress, but this has occurred in only one case. GETCHES, *supra* at 444–48 (discussing Arizona v. California, 373 U.S. 546 (1963)).

1. The Water Cycle

Water on Earth is very old—likely dating back about 4.6 billion years.[44] The precise source of Earth's water is shrouded in mystery. As the planet was forming, it almost certainly contained water molecules.[45] But in its early stages, Earth was so hot that any surface water probably would have evaporated into space, uncontained at that time by a protective atmosphere.[46] Given these conditions, scientists posit that icy asteroids or comets brought water to our planet later in time. When these celestial formations collided with the young Earth, they could easily have delivered, in frozen form, what one science writer describes as "oceans' worth of water."[47]

Those extra-terrestrial deliveries provided Earth with a fixed and finite water supply. As the National Ground Water Association explains:

> Water is a finite resource. The bottled water that is consumed today might possibly be the same water that once trickled down the back of a woolly mammoth. The Earth is a closed system, meaning that very little matter, including water, ever leaves or enters the atmosphere; the water that was here billions of years ago is still here now.[48]

Some sources refer to "new" water, but these references are best understood as an imprecise description of new *sources* from which a

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[44] Rick Pantaleo, *About Half of the Water You Drink is Older than the Sun*, SCIENCE WORLD, Sept. 26, 2014, http://blogs.voanews.com/science-world/2014/09/26/about-half-of-the-water-you-drink-is-older-than-the-sun/ (discussing L. Ilsedore Cleeves et al., *The Ancient Heritage of Water Ice in the Solar System*, 345 SCIENCE 1590 (Sept. 26, 2014)). *See also Data from Rosetta Mission Indicates Water on Earth Came from Asteroids*, DEUTSCHE WELLE, Dec. 10, 2014; Christopher Crockett, *How Did Earth Get Its Water?*, 187 SCIENCE NEWS 18, MAY 16, 2015, https://www.sciencenews.org/article/how-did-earth-get-its-water.

[45] Brian Greene, *How Did Water Come to Earth? It Took an Out-of-this-World Arrival to Get that Perfect Chemical Combination for Water to Fill Our Planet*, ASK SMITHSONIAN, May 2013, http://www.smithsonianmag.com/science-nature/how-did-water-come-to-earth-72037248/.

[46] *Id. See also* Natalie Wolchover, *Water: Where Are You From?*, LIVESCIENCE, Sept. 18, 2011, http://www.livescience.com/33505-water-strange-physics.html.

[47] Greene, *supra* note 45 (explaining that both comets and asteroids potentially furnished "ready-made sources" of Earth's water, but "recent observations of [comets' and asteroids'] chemical makeups are tipping the scale toward asteroids" as the more likely source of Earth's water). *See also* Wolchover, *supra* note 46 (explaining that during the "Late Heavy Bombardment" period around four billion years ago, "massive objects, probably from the outer solar system, hit Earth and the inner planets" and possibly "were filled with water, and . . . these collisions could have delivered gigantic reservoirs of water to Earth").

[48] NGWA, *Information on Earth's Water*, http://www.ngwa.org/Fundamentals/teachers/Pages/information-on-earth-water.aspx (2012). *See also* THOMAS V. CECH, PRINCIPLES OF WATER RESOURCES: HISTORY, DEVELOPMENT, MANAGEMENT, AND POLICY 24 (2003) (describing the movement of water through the hydrologic cycle and explaining, "[w]ater is not created or destroyed in this process but simply changes form and location").

particular community or water user plans to extract water from the finite and ancient store.[49]

The planet's water is in constant motion throughout what is called the "hydrologic cycle" or "water cycle." Water can be found above, on, and beneath the earth's surface; it assumes liquid, solid, and vaporous form; it can be fresh or salty.[50] Through precipitation, atmospheric moisture coalesces and falls to the ground in forms such as rain or snow.[51] The "runoff" then moves downhill by gravity, and can be taken up by vegetation, incorporated into glacial ice, infiltrate or percolate below ground, or evaporate and return to the atmosphere.[52] At any given moment, about 97.5 percent of the earth's water supply takes the form of saline ocean water, leaving only 2.5 percent of water as the precious fresh water supply essential for human needs.[53] Most freshwater is frozen in glaciers and icecaps; however, climate change has slowly led to the melting of some of this water and its release into the saline oceans.[54] Of the remaining store of freshwater, the bulk of it is groundwater, which comprises about 97 percent of the Earth's unfrozen freshwater resources.[55] Thus, groundwater is an essential resource for human survival, and its use likely will continue to trigger disputes.

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[49] *See* Christine A. Klein, *Water Transfers: The Case Against Transbasin Diversions in the Eastern States*, 25 UCLA J. ENVTL. L. & POL'Y 249, 263 (2006–2007) (discussing the myth of "new" water); Symposium, *New Water*, TEX. A&M J. PROP. L. (2017) (considering brackish aquifers, rainwater harvesting, water reuse, cloud seeding, and tree/plant removal as sources of "new water").

[50] U.S. Geological Survey, *The Water Cycle, A Quick Summary* (2016), https://water.usgs.gov/edu/watercyclehi.html.

[51] CECH, *supra* note 48, at 24–25 (noting that precipitation also includes sleet, hail, and "virga"—which is "rain that evaporates before reaching the ground").

[52] *Id.*

[53] *Id.* at 25; U.S. Geological Survey, *supra* note 50.

[54] CECH, *supra* note 48, at 25 (calculating glaciers and icecaps as locking up about 74 percent of Earth's freshwater resources); Renee Martin-Nagle, *Fossil Aquifers: A Common Heritage of Mankind*, 2011 J. ENERGY & ENVTL. L. 39 (2011).

[55] Jean Margat et al., *Concept and Importance of Non-Renewable Resources* 13, *in* UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION, NON-RENEWABLE GROUNDWATER RESOURCES: A GUIDEBOOK ON SOCIALLY-SUSTAINABLE MANAGEMENT FOR WATER-POLICY MAKERS (Stephen Foster & Daniel P. Loucks eds., 2006), http://unesdoc.unesco.org/images/0014/001469/146997e.pdf [hereinafter, UNESCO]. Adding glaciers and icecaps back into the equation, freshwater is divided into glaciers and icecaps (74 percent of freshwater), groundwater (25.6 percent of freshwater, or 0.64 percent of the Earth's total water supply), and surface water including lakes, rivers, soil moisture, and the atmosphere (0.4 percent of freshwater or about 0.01 percent of the Earth's total water supply). The U.S. Geological Survey provides slightly different figures: groundwater makes up 30.1 percent of the Earth's freshwater, while surface water makes up 1.3 percent of the Earth's freshwater. U.S. Geological Survey, *supra* note 50.

2. Special Treatment of Groundwater

Groundwater generally travels through aquifers under the force of gravity, but as one geologist notes, "the direction and rate of movement are determined by lithology, stratigraphy, and structure of geologic deposits."[56] The speed of groundwater migration varies widely. For example, groundwater might travel several feet per day through a gravel aquifer, but through a clay formation only a few inches *per year*.[57] In contrast, water in some rivers can travel many miles per day.[58] "Residence time," an important measurement of groundwater movement, refers to the period during which groundwater remains in a particular aquifer.[59] Groundwater residence times range from about two weeks up to ten thousand years[60]—a time frame well beyond the scale of any human dispute. Groundwater with residence times stretching out for millennia is sometimes described as "fossil groundwater."[61]

Although all water is interconnected through the water cycle, groundwater has often been given special legal treatment under the law. In large part, this exceptionalism was born of hydrologic ignorance. As the Connecticut Supreme Court mused in 1863:

> Water, whether moving or motionless *in the earth*, is not, in the eye of the law, distinct from the earth. The laws of its existence and progress, while there, are not uniform, and cannot be known or regulated. It rises to great heights, and moves collaterally, by influences beyond our apprehension. These influences are so secret, changeable and uncontroulable, we cannot subject them to the regulations of law, nor build upon them a system of rules, as has been done with streams upon the surface.[62]

Accordingly, the court declined to award relief to a plaintiff well owner against a subsequent pumper who tapped into the same aquifer, even though the trial court specifically found that the defendant's pumping had lowered the water table below the reach of the plaintiff's well.[63]

The law's exceptional treatment of groundwater might also be a result of the pace of technological development. Society did not develop the capacity to extract large volumes of groundwater until the mid-twentieth

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56 CECH, *supra* note 48, at 101–02.

57 *Id.*

58 *Id.*

59 *Id.* at 106–07.

60 *Id.*

61 UNESCO, *supra* note 55, at 14.

62 Roath v. Driscoll, 20 Conn. 533, 540 (Conn. 1850) (emphasis in original).

63 *Id. See also* Christine A. Klein, *On Integrity: Some Considerations for Water Law*, 56 ALA. L. REV. 1009, 1058–64 (discussing the historical separation of the law of surface water and groundwater).

century, and by that time surface water law had been established for about a century.[64] As Professor Robert Glennon explains,

> The groundwater spigot was opened wide in the 1940s and 1950s, as high-lift turbine pumps, industrial and automobile engines, center-pivot irrigation systems, gear-driven pump heads, small diameter wells and casings, and the availability of natural gas and powerline electricity as energy sources dramatically lowered the costs for installing and operating irrigation systems. These technological developments profoundly increased the capacity of wells to extract groundwater. Large-capacity wells could retrieve water from 3,000 feet below the surface and produce 1,200-1,300 gallons per minute.[65]

After the mid-twentieth century, groundwater pumping increased dramatically—with 1000 percent increases in some cases—causing some water tables to drop more than 150 feet.[66] Until large scale extraction of groundwater became possible, conflicts with surface users would not have been widespread and pervasive. As such, there had been little incentive for the law to develop a coherent system of groundwater regulation, much less to integrate that system into the law of surface water rights.

The bifurcation between the law of surface water and the law of groundwater has led to the development of a bewilderingly confusing regulatory regime. Today, each state follows one of three different legal systems for the allocation of surface water rights, and one of five different regimes for the allocation of groundwater rights.[67] In an attempt to minimize unnecessary complexity, some states have begun to implement "conjunctive use" to jointly manage surface and groundwater resources. As one leading commentator explained: "Joint management of connected surface and groundwater sources is the only reasonable way to deal with what is in fact a single resource."[68]

The litigation between Mississippi and Tennessee has the potential to impede the legal integration of surface water and groundwater law if the

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[64] *See, e.g.*, Irwin v. Phillips, 5 Cal. 140 (Cal. 1855) (establishing the system of prior appropriation for the allocation of the right to use surface water in California).

[65] ROBERT GLENNON, WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS 26 (2002).

[66] *Id.* (discussing the Ogallala Aquifer beneath Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming).

[67] *See infra* Part IV.C. The western states allocate surface water rights under the doctrine of prior appropriation, whereas the eastern states follow the riparian doctrine. More recently, some eastern states have supplemented or supplanted the common law with so-called "regulated riparian" statutory schemes. CHRISTINE A. KLEIN ET AL., NATURAL RESOURCES LAW: A PLACE-BASED BOOK OF PROBLEMS AND CASES 866–902 (3d ed. 2013).

[68] GETCHES, *supra* note 41, at 293–94.

Supreme Court agrees with Mississippi that the state owns the groundwater beneath its territory, or if the Court concludes that it lacks the jurisdiction to equitably apportion the right to use the water of an interstate aquifer.

C. Mississippi I

In 2005, Mississippi brought suit against the city of Memphis and its utility, MLGW.[69] In its original and first amended complaints, Mississippi alleged that Memphis and MLGW wrongfully appropriated groundwater from the Memphis-Sparta Aquifer, and sought past and future damages, as well as equitable relief.[70] In *Hood ex rel. Mississippi v. City of Memphis*,[71] the trial court dismissed the action without prejudice, holding that the State of Tennessee was a necessary and indispensable party under Rule 19 of the Rules of Civil Procedure.[72] The court also held that it lacked the authority to join Tennessee because the U.S. Supreme Court has original and exclusive jurisdiction over disputes between the states.[73] The Fifth Circuit affirmed, noting that Mississippi could seek an adequate remedy through equitable apportionment by the U.S. Supreme Court.[74] The court asserted: "The fact that this particular water source is located underground, as opposed to resting above ground as a lake, is of no analytical significance."[75] Mississippi later filed a petition for writ of certiorari,[76] which the Supreme Court denied without comment.[77]

The following subsections undertake a nuanced analysis of the language employed by the parties in arguing their positions and by the courts in rendering their decisions. The primary purpose is not to evaluate all legal arguments before the court, a study that has been undertaken by

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[69] Complaint, *Hood v. Memphis*, *supra* note 28, at *3; First Amended Complaint, *Hood v. Memphis, supra* note 37, at *5–6.

[70] The original complaint included claims of unjust enrichment, violation of the Restatement (Second) of Torts §§ 858(1)(a) & (b), trespass, conversion, nuisance, and inverse condemnation. Complaint, *Hood v. Memphis*, *supra* note 28, at *11–26. The First Amended Complaint moved the conversion claim to first position (and otherwise reordered the claims), and omitted the claims of inverse condemnation and violation of the Restatement (Second). First Amended Complaint, *Hood v. Memphis*, *supra* note 37, at *9–16.

[71] 533 F. Supp. 2d 646 (N.D. Miss. 2008).

[72] *Id.* at 650.

[73] *Id.* at 649 (citing 28 U.S.C. § 1251(a)).

[74] Hood *ex rel.* Mississippi v. City of Memphis, 570 F.3d 625, 633. (5th Cir. 2009).

[75] *Id.* at 630.

[76] Petition for Writ of Certiorari, Mississippi v. City of Memphis, 559 U.S. 904 (Sept. 2, 2009) (No. 09-289), 2009 WL 2876189 [hereinafter Petition for Certiorari, *Hood v. Memphis*].

[77] Mississippi v. City of Memphis, 559 U.S. 904 (2010).

previous commentators.[78] Instead, the goals are twofold: 1) to discern the parties' and tribunals' relative acceptance or rejection of the notion that states own specific portions of waterbodies, rather than simply regulate water use by their citizens; and 2) to determine the extent, if any, to which the litigation treats groundwater and surface water differently.

1. Mississippi's Position—Ownership Dates Back to 1817

Mississippi's ownership theory evolved during the course of the litigation. In its original complaint, Mississippi acknowledged that the Memphis-Sparta Aquifer is a shared resource, but the state argued that Memphis was withdrawing "quantities of groundwater in excess of its share of the Aquifer to the direct ultimate detriment of the State."[79] The complaint contained language of both use and ownership. For example, Mississippi complained that Memphis' withdrawals had "exceed[ed] its reasonable or beneficial share of the Aquifer in violation of Mississippi's correlative rights and the rights for reasonable and beneficial use of the People of the State."[80] The complaint also contained some language of "ownership," arguing that the groundwater withdrawn and used by Memphis is "owned by the State [of Mississippi] for the benefit and use of the People of Mississippi."[81]

In its first amended complaint, Mississippi asserted a more robust vision of state groundwater ownership based on the water's geographic location beneath Mississippi under pre-development conditions:

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[78] *See, e.g.*, Noah D. Hall & Joseph Regalia, *Interstate Groundwater Law Revisited:* Mississippi v. Tennessee, 34 VA. ENVTL. L.J. 152 (2016); Noah D. Hall, *Lines in the Sand: Interstate Groundwater Disputes in the Supreme Court*, 31 NAT. RESOURCES & ENV'T 8 (2016); Noah D. Hall & Benjamin L. Cavataro, *Interstate Groundwater Law in the Snake Valley: Equitable Apportionment and a New Model for Transboundary Aquifer Management*, 2013 UTAH L. REV. 1553, 1607–11 (2013); Matthew Ley, *What Are You Going to Do About It?: The Ramifications of the* Edwards Aquifer Authority v. Day *Decision on Interstate Groundwater Disputes*, 65 BAYLOR L. REV. 661, 662–669 (2013); Mark S. Davis & Michael Pappas, *Escaping the* Sporhase *Maze: Protecting State Waters Within the Commerce Clause*, 73 LA. L. REV. 175 (2012); L. Elizabeth Sarine, *The Supreme Court's Problematic Deference to Special Masters in Interstate Water Disputes*, 39 ECOLOGY L.Q. 535 (2012); Michael D. Tauer, *Evolution of the Doctrine of Equitable Apportionment*—Mississippi v. Memphis, 41 U. MEM. L. REV. 897 (2011); Justin Newell Hesser, *The Nature of Interstate Groundwater Resources and the Need of States to Effectively Manage the Resource Through Interstate Compacts*, 11 WYO. L. REV. 25 (2011).

[79] Complaint, *Hood v. Memphis*, *supra* note 28, at *8 (asserting Memphis' withdrawals had "exceed[ed] its reasonable or beneficial share of the Aquifer in violation of Mississippi's correlative rights and the rights for reasonable and beneficial use of the People of the State").

[80] *Id.*

[81] *Id.* at 15. *See also id.* at 20 (alleging Memphis "has taken and damaged, and continues to take and damage, valuable property and property rights belonging to the People of Mississippi represented by the State herein").

> For decades, Memphis-MLGW's heavy pumping of [its] municipal wells has caused or contributed to diversion and change of the pre-development or natural south-westerly flow path of the Aquifer so that ground water is now, and has for years been, flowing northward from Mississippi into Memphis. As a result of Memphis-MLGW's pumping, a cone of depression centered under and expanding outward from Memphis has formed in the Aquifer. This has for, at least, the past four decades, caused billions of gallons of Mississippi's ground water to flow northward away from Mississippi, across the border, and into Defendants' wells and wellfields for production of such ground water into MLGW's water distribution system for sale and delivery to Defendants' customers.[82]

Mississippi's subsequent briefs articulate a vision of state ownership that includes *all* water resources within its borders—both surface water and groundwater. In reply to the defendants' motion to dismiss the complaint, Mississippi claimed that it "owns all of the surface and ground water resources of the State as a matter of law."[83] Elaborating on its assertion, the plaintiff explained:

> Ownership of Mississippi's ground water resources has vested exclusively in the State since 1817, the time when Mississippi was admitted to the Union. Each state, including Mississippi, owns the surface water and ground water resources within the geographical confines of its boundaries as a function of statehood. The water resources of each state properly belong to each such state by their inherent sovereignty . . . .Each state has full jurisdiction over the lands within its borders, including the beds of streams and other waters . . . .Such title being in the state, the lands are subject to state regulation and control.[84]

Later, in its petition for certiorari, Mississippi leaned heavily on this sovereign ownership theory. Mississippi presented for review the question:

> Whether ground water residing within the boundaries of the State of Mississippi at the time it entered the Union, which did not under natural circumstances flow into the State of Tennessee, constitutes a natural resource over which the State of Mississippi holds the rights of a sovereign, making the doctrine of equitable apportionment inapplicable.[85]

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82 First Amended Complaint, *Hood v. Memphis*, *supra* note 37, at *7.

83 Plaintiff's Reply Memorandum, *Hood v. Memphis*, *supra* note 38, at *1.

84 *Id.* at *2 (citing Kansas v. Colorado, 206 U.S. 46, 94 (1907)).

85 Petition for Certiorari, *Hood v. Memphis*, *supra* note 76, at *1.

In addition to its theoretical rejection of equitable apportionment, the plaintiff also disavowed apportionment on pragmatic grounds—such a claim would not allow Mississippi to seek a judgment for the hundreds of millions of dollars it sought against the defendants.[86]

2. Memphis' Arguments—From Ownership to Use

Memphis filed a motion to dismiss Mississippi's original complaint on a variety of alternative grounds including ripeness, standing, subject matter jurisdiction, venue, and failure to join Tennessee as an indispensable party.[87] Initially, Memphis accepted Mississippi's ownership theory—at least provisionally. To the extent the Aquifer is owned by and subject to the right of use by Mississippi, Memphis claimed that the Aquifer is also owned by and subject to a similar right of use by Tennessee.[88] In support of this proposition, Memphis cited Tennessee statutes asserting state ownership over waters in the context of water pollution and safe drinking water standards—authority not relevant directly to the question of the right to use water.[89] As a consequence, Memphis argued, Tennessee must be joined as an indispensable party under Rule 19(a) of the Federal Rules of Civil Procedure to protect the state's ownership interest in the Aquifer. Such joinder, Memphis concluded, would strip the federal district court of subject matter jurisdiction because the U.S. Supreme Court has original and exclusive jurisdiction over disputes between two or more states—requiring dismissal of the lawsuit.[90] Ultimately, the district court rejected Memphis' arguments and denied its motion to dismiss.[91]

After Mississippi amended its complaint to clarify its request for monetary damages and to eliminate several claims,[92] Memphis again

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[86] *Id.* at *11 ("Equitable apportionment does not compensate for past legal wrongs; rather, it is solely designed to ensure a state its future share of a shared natural resource . . . .Mississippi seeks damages for retroactive periods dating back forty years.").

[87] Defendants' Memorandum of Law in Support of Their Motion to Dismiss, Hood *ex rel.* Mississippi v. City of Memphis, 533 F. Supp. 2d 646 (N.D. Miss. Mar. 10, 2005) (No. 2:05 Cv32-D-B), 2005 WL 1183346 [hereinafter Motion to Dismiss, *Hood v. Memphis*].

[88] *Id.*

[89] *Id.* (quoting the Tennessee Water Quality Control Act of 1977's assertion that "the waters of Tennessee are the property of the state and are held in public trust for the use of the people of the state" and the Tennessee Safe Drinking Water Act of 1983's statement that "the waters of the state are the property of the state and are held in public trust for the use of the people of the state." TENN. CODE ANN. § 69-3-102(a)).

[90] *Id.*

[91] Hood *ex rel.* Mississippi v. City of Memphis, 570 F.3d 625, 627–28 (5th Cir. 2009) (reviewing the procedural posture of the case and discussing the district court's denial of Memphis's motion to dismiss and motion for rehearing). *See infra* Part II.C.3.

[92] First Amended Complaint, *Hood v. Memphis*, *supra* note 37.

argued that Tennessee was an indispensable party, and filed a motion for judgment on the pleadings.[93] Memphis also moved for partial summary judgment on several claims, including that of conversion.[94] In its motion for partial summary judgment, Memphis shifted course and rejected the ownership theory it had provisionally embraced in response to Mississippi's original complaint. Instead, Memphis focused on the states' authority to regulate the use of water within their borders. It argued that a state's claim of water ownership is a "legal fiction" that "really means . . . that the state has the right to regulate the *use* of ground water within its borders."[95] In support of this contention, Memphis cited *Sporhase v. Nebraska*[96]—a dormant commerce clause opinion by the U.S. Supreme Court. In addition, Memphis cited a 1990 opinion in which the Mississippi Supreme Court rejected the ownership theory, explaining: "In its ordinary or natural state, water is neither land, nor tenement, nor susceptible of absolute ownership. It is a movable, wandering thing and admits only of a transient, usufructuary property."[97]

Notably, Memphis' rejection of state groundwater ownership was not absolute. Memphis could have relied on the fact that the *Aquifer* underlies multiple states, and therefore its contents should not be owned by a single state. Instead, Memphis hedged its bets by asserting that the Aquifer's *water* also crossed state lines and should therefore be shared by the states. The Aquifer, Memphis explained, is "not like a bathtub" but is a "dynamic and flowing interstate natural resource."[98] Even in pre-development times, Memphis claimed, the Aquifer's groundwater

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[93] Defendants' Motion for Judgment on the Pleadings, Hood *ex rel.* Mississippi v. City of Memphis, 533 F. Supp. 2d 646 (N.D. Miss. 2008) (No. 2:05CV32-D-B) [hereinafter Defendants' Motion for Judgment, *Hood v. Memphis*].

[94] Defendants' Reply Memorandum in Support of Their Motion for Partial Summary Judgment re: Conversion, Hood *ex rel.* Mississippi v. City of Memphis, 533 F. Supp. 2d 646 (N.D. Miss. 2008) (No. 2:05CV32-D-B), 2007 WL 4673347 [hereinafter Defendants' Conversion MSJ, *Hood v. Memphis*].

[95] *Id.* at *2–3 (emphasis added) (asserting there is no authority for the proposition that a state's interest in the groundwater "which happens to be moving beneath it" supports a claim of ownership and conversion).

[96] 458 U.S. 941, 951–53 (1982) (asserting that the public ownership theory, as developed in the context of wild animals and applied to subterranean water, is "but a fiction expressive in legal shorthand of the importance to its people that a State have power to preserve and regulate the exploitation of an important resource"; and recognizing such claims to public ownership are not without significance because, "[l]ike Congress' deference to state water law . . . these factors inform the determination whether the burdens on commerce imposed by state ground water regulation are reasonable or unreasonable").

[97] Dycus v. Sillers, 557 So. 2d 486, 501–02 (Miss. 1990) (quoting State Game & Fish Comm'n v. Louis Fritz Co., 193 So. 9, 11 (Miss. 1940)).

[98] Brief of Appellees, Hood *ex rel.* Mississippi v. City of Memphis, at *9, 570 F.3d 625 (5th Cir. 2009) (No. 2:05CV32-D-B), 2008 WL 6729950, [hereinafter Brief of Appellees, *Hood v. Memphis*].

naturally flowed from beneath Mississippi northwest into Tennessee, and then west into Arkansas or directly into the Mississippi River.[99] In so arguing, Memphis gave a measure of credibility to Mississippi's sovereign ownership theory, at least if the groundwater within the interstate formation does not meet some unspecified interstate flow criteria. This bifurcation between the Aquifer's geologic and hydrologic characteristics recurs throughout the litigation in contrast to the rules governing interstate surface waters.

3. The District Court's Opinion—From Use to Ownership

Initially, the district court saw the case as a dispute over the right to use, not own, groundwater. In its denial of the defendants' motion to dismiss the original complaint,[100] the district court relied on *Illinois v. City of Milwaukee*,[101] a 1972 U.S. Supreme Court opinion. *Milwaukee* was a federal common law nuisance action in which Illinois sought to enjoin Milwaukee and several local entities from polluting Lake Michigan, an interstate water body. In that action, the Court determined that it was not necessary to join the state of Wisconsin as a defendant.

The *Hood* district court relied on the *Illinois* nuisance dispute, even though it recognized that *Illinois* involved issues of water use, not ownership."[102] Soon after, however, the district court shifted course and embraced Mississippi's ownership theory. In granting Memphis' motion to dismiss the first amended complaint for failure to join Tennessee as an indispensable party, the district court explained:

> While this court, in initially denying the Defendants' motion seeking relief under Rule 19, relied upon another Supreme Court case, *Illinois v. City of Milwaukee* . . . for the proposition that a State need not be joined in a nuisance action brought by a neighboring State against cities and local commissions in that State and involving an interstate waterway, the court finds that cases such as *Louisiana v. Mississippi* are more closely analogous to the case *sub judice* because the partition of an interstate body of water is a necessary condition of affording the Plaintiff relief in this case. The case *sub judice* involves a proprietary or ownership interest in subsurface water. The *Illinois v. City of Milwaukee* . . . case did not involve a dispute over ownership of

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[99] *Id.* at *9–10.

[100] *See* Hood *ex rel.* Mississippi v. City of Memphis, at 649, 533 F. Supp. 2d 646 (N.D. Miss. 2008) (explaining procedural history of the case); *See also* Hood *ex rel.* City of Memphis, 570 F.3d 625, 627–28 (5th Cir. 2009) (explaining procedural history of the case).

[101] 406 U.S. 91 (1972).

[102] *Hood*, 533 F. Supp. 2d at 649 (explaining that court's initial denial of defendants' motion seeking relief under Rule 19 relied on *Illinois v. Milwaukee*).

> interstate water or any other property; the *Louisiana v. Mississippi* case, as well as other aforecited cases, did involve disputes over such ownership issues.[103]

The district court held that Tennessee was a necessary and indispensable party,[104] couching its analysis in terms of ownership:

> [In Tennessee's] absence complete relief cannot be accorded among those already parties to the action. This is true because to afford the State of Mississippi the relief sought and to hold that the Defendants have misappropriated Mississippi's water from the Memphis Sands aquifer, the court must necessarily determine *which portion of the aquifer's water belongs to Mississippi, which portion belongs to Tennessee,* and so on, thereby effectively apportioning the aquifer.[105]

However, the court recognized that it lacked authority to join Tennessee because disputes between states are within the exclusive and original jurisdiction of the U.S. Supreme Court.[106] As a result, the district court dismissed the action without prejudice for failure to join Tennessee.[107]

In support of its analysis, the district court relied heavily on the U.S. Supreme Court's "equitable apportionment" decisions, and the district court characterized such cases as "disputes over . . . ownership issues."[108] Noting that the doctrine "has historically been the means by which disputes over interstate waters are resolved," the court suggested that Mississippi should "petition the Supreme Court for apportionment of the

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[103] *Id.* (citing Louisiana v. Mississippi, 516 U.S. 22 (1995); Mississippi v. Louisiana, 506 U.S. 73 (1992)). *Louisiana v. Mississippi* involved a dispute over a seven-mile portion of the boundary between Louisiana and Mississippi, which had previously been marked by the Mississippi River. When the main navigational channel shifted course over time through erosion and accretion, the states disagreed as to the ownership of an island that had been within Mississippi's boundary before the river's change. *See Louisiana v. Mississippi*, 516 U.S. at 25 (confirming Mississippi's sovereignty over disputed island).

[104] *Hood*, 533 F. Supp. 2d at 648.

[105] *Id.* at 649 (emphasis added).

[106] *Id.* at 650.

[107] *See Hood*, 570 F.3d at 627–28 (reviewing procedural history of the case and explaining that "[i]n late January 2008, shortly before the bench trial was to start, the district court announced that it had decided *sua sponte* to revisit the issue of Tennessee's possible status as an indispensable party and thus the court's subject-matter jurisdiction").

[108] *Hood*, 533 F. Supp. 2d at 648–49 ("While there are apparently no reported cases dealing with interstate subsurface water or aquifers, it is admitted by all parties and revealed in exhibits that the Memphis Sands or Sparta aquifer lies under several States including the States of Tennessee and Mississippi."). Part IV.B will evaluate the accuracy of rooting the equitable apportionment doctrine in state ownership of water resources.

waters of the Memphis Sands aquifer in a suit that properly joins all necessary and indispensable parties, including the State of Tennessee."[109]

4. The Fifth Circuit's Opinion—Muddying the Waters

The Fifth Circuit equivocated as to whether it embraced Mississippi's ownership theory or Memphis' qualified use theory; however, it ultimately affirmed the district court's dismissal of Mississippi's amended complaint.[110] Breaking new legal ground, the Fifth Circuit explicitly found the equitable apportionment doctrine—historically applicable to interstate surface streams—applicable to the disputed Aquifer:

> Determining Mississippi and Tennessee's relative rights to the Aquifer brings this case squarely within the original development and application of the equitable apportionment doctrine. The fact that this particular water source is located underground, as opposed to resting above ground as a lake, is of no analytical significance. *The Aquifer flows, if slowly, under several states, and it is indistinguishable from a lake bordered by multiple states or from a river bordering several states depending upon it for water*.[111]

However, while the Fifth Circuit determined that equitable apportionment was relevant to the dispute, it did not clearly state whether it viewed equitable apportionment as the allocation of use rights or ownership rights.

In much of its opinion, the Fifth Circuit employed the language of use. It described equitable apportionment as a federal common law doctrine governing interstate conflicts regarding over the states' "rights to use the water of an interstate stream."[112] Accordingly, the Fifth Circuit rejected Mississippi's claim that it owned the water beneath its territory, explaining that: "The Supreme Court has consistently rejected the argument advanced by different states, and advanced by Mississippi in

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[109] *Id.* at 648, 650.

[110] *Hood*, 570 F.3d at 627.

[111] *Id.* at 629–30 (emphasis added). Softening the potential novelty of its holding, the Fifth Circuit observed, "A handful of Supreme Court cases mention aquifers in the context of interstate water disputes . . . .While these opinions do not address aquifer allocation directly, the fact that the aquifers were not treated differently from any other part of the interstate water supply subject to litigation supports the conclusion that the Aquifer at issue must be apportioned." *Id.* at 630 n.5.

[112] *Id.* at 629–30 (first citing Hinderlider v. La Plata River & Cherry Creek Ditch Co., 304 U.S. 92, 104–05 (1938); then quoting Colorado v. New Mexico, 459 U.S. 176, 183 (1982)).

this lawsuit, that state boundaries determine the amount of water to which each state is entitled from an interstate water source."[113]

Despite this language, the Fifth Circuit's rejection of state groundwater ownership was ambivalent, and its statements indicate some acceptance of the ownership theory. It captioned its discussion of whether Tennessee was a necessary party as "Tennessee is a Necessary Party to this Water Ownership Dispute."[114] Moreover, the court suggested that both parties agreed that their respective states owned the groundwater within their borders. In describing Mississippi's position, the court stated: "Mississippi argues that its suit does not require an equitable apportionment of the Aquifer because the state owns the groundwater resources of the state as a self-evident attribute of statehood, and thus there is no interstate water to be equitably apportioned."[115] Likewise, the court characterized Memphis' position as ownership-based: "Memphis argues that because Tennessee's sovereign ownership rights in the Aquifer water, *the same which Mississippi seeks to protect*, are implicated, the case cannot be properly resolved without Tennessee's participation."[116]

5. Moving on to Mississippi II

After losing in the Fifth Circuit, Mississippi filed a petition for writ of certiorari.[117] It asserted, among other things, that the Aquifer's groundwater "[u]nlike the surface water of watersheds, streams, rivers and lakes" forms a "pure finite resource" that would not flow into Tennessee "under natural conditions."[118] The U.S. Supreme Court denied certiorari without opinion.[119]

On the same day that it petitioned for certiorari in *Hood*, Mississippi added the State of Tennessee as a defendant and petitioned the U.S.

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113 *Id.* (exemplifying the Court's consistent denial on interstate streams that "the upper State has such ownership or control of the whole stream as entitles it to divert all the water, regardless of any injury or prejudice to the lower State").

114 *Id.* at 629.

115 *Id.*

116 *Id.* (emphasis added). In a footnote, the court cited to an assertion by the state of Tennessee, as an *amicus curiae* in the appeal, that "it has a sovereign interest in its share of Aquifer water as great as that asserted by Mississippi." *Id.* at 629 n.4. Despite this characterization of Tennessee's position as ownership-based, the state's references to its "core sovereign interests" were likely a shorthand reference to its right to use an equitable share of the Aquifer.

117 City of Memphis, Tennessee and Memphis Light, Gas & Water Division's Motion for Judgment on the Pleadings and Memorandum of Law in Support at 1–2, Mississippi v. Tennessee, No. 143 (U.S. Sept. 5, 2014), http://www.ca6.uscourts.gov/special-master [hereinafter Memphis' Motion for Judgment on the Pleadings, *Mississippi v. Tennessee*].

118 Petition for Certiorari, *Hood v. Memphis*, *supra* note 76, at *3.

119 *See* Mississippi v. City of Memphis, 559 U.S. 904 (2010).

Supreme Court for leave to file a complaint in an original action.[120] Mississippi requested a hefty one billion dollars in damages for the alleged conversion of the contested groundwater.[121] In the alternative, Mississippi brought a claim for equitable apportionment of the Aquifer "*if and only if* this Court determines that Mississippi does not own and control the ground water resources within its borders."[122] Thus, Mississippi's position evolved from an adamant assertion of groundwater ownership to a grudging acceptance that it might be required to share the use of the Aquifer's water with Tennessee.

The Court denied Mississippi's motion without comment, providing only a string citation to two of its precedents.[123] These two cases provide critical guideposts for the litigation that would follow in *Mississippi II*. The first, *Virginia v. Maryland*, refers to equitable apportionment as a method of resolving water disputes among the states, seemingly reinforcing the Fifth Circuit's conclusion that equitable apportionment is applicable to the disputed groundwater: "Federal common law governs interstate bodies of water, ensuring that the water is equitably apportioned between the States and that neither State harms the other's interest in the river."[124] Second, the Court also cited *Colorado v. New Mexico*, which established substantial injury as a threshold requirement for invoking the Court's equitable apportionment jurisdiction: "Our cases establish that a state seeking to prevent or enjoin a diversion by another state bears the burden of proving that the diversion will cause it 'real or substantial injury or damage.'"[125]

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[120] State of Mississippi's Motion for Leave to File Bill of Complaint in Original Action, Complaint, and Brief in Support of Motion, Mississippi v. Tennessee, No. 143 (U.S. June 6, 2014), http://www.ca6.uscourts.gov/special-master [hereinafter Complaint, *Mississippi v. Tennessee*]; Memorandum of Decision on Tennessee's Motion to Dismiss, Memphis and Memphis Light, Gas & Water Division's Motion to Dismiss, and Mississippi's Motion to Exclude, Mississippi v. Tennessee, No. 143 (U.S. Aug. 12, 2016), http://www.ca6.uscourts.gov/special-master [hereinafter Special Master's Memorandum, *Mississippi v. Tennessee*].

[121] Brief for the United States as Amicus Curiae at 6, Mississippi v. Tennessee, No. 143 (U.S. May 2015), http://www.ca6.uscourts.gov/special-master [hereinafter United States' Amicus Brief, *Mississippi v. Tennessee*].

[122] Motion of Defendant State of Tennessee for Judgment on the Pleadings at 10–11, Mississippi v. Tennessee, No. 143 (U.S. Feb. 25, 2016), http://www.ca6.uscourts.gov/special-master [hereinafter Tennessee's Motion for Judgment on the Pleadings, *Mississippi v. Tennessee*] (quoting Motion for Leave to File Bill of Complaint in Original Action, Mississippi v. City of Memphis, 559 U.S. 904 (2010) (No. 09-289), at ¶ 5(c)).

[123] Mississippi v. City of Memphis, 559 U.S. 901 (2010).

[124] Virginia v. Maryland, 540 U.S. 56, 74, n.9 (2003) (emphasis added) ("Equitable apportionment is the doctrine of federal common law that governs the disputes between States concerning their rights to use the water of an interstate stream.") (quoting Colorado v. New Mexico, 459 U.S. 176, 183 (1982)).

[125] *Colorado v. New Mexico*, 459 U.S. at 187, n.13 (emphasis added) (quoting Connecticut v. Massachusetts, 282 U.S. 660, 672 (1931)).

Thus, the Supreme Court reminded the parties that it requires proof of *interstate injury* before it will engage in an equitable apportionment. Nevertheless, the initial proceedings in *Mississippi II* would instead suggest that the plaintiff must prove that the disputed groundwater had *interstate flow* at some historical point in time.[126] This subtle reframing of the threshold question could have broad ramifications.[127]

D. Mississippi II

1. Mississippi's Claims—Focus on Predevelopment Flow, Not Injury

In 2014, Mississippi again moved the U.S. Supreme Court for leave to file a complaint against Memphis, MLGW, and Tennessee in an original action, *Mississippi v. Tennessee*.[128] This time, Mississippi specifically rejected the relevance of equitable apportionment,[129] casting the disputed water as "intrastate" water that "simply cannot be subject to equitable apportionment."[130] The plaintiff also emphasized the distinction between surface and groundwater:

> Equitable apportionment assumes the existence of interstate surface water which visibly *moves freely from one state to another without human intervention*. This assumption cannot be automatically applied to deep confined groundwater . . . .Such groundwater may, or may not, be naturally shared. This is a matter of evidence, not unsupported presumptions.[131]

The Supreme Court granted Mississippi's motion on June 29, 2015.[132] The Court's change of position was puzzling. Perhaps Mississippi had suffered sufficient harm by 2014 to warrant the Court's assertion of jurisdiction. Perhaps the Court was now receptive to Mississippi's claim of groundwater ownership.[133] Or perhaps the Court wanted to reach the

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126 *See infra* notes 135–37 and accompanying text.

127 *See infra* Part III.

128 Complaint, *Mississippi v. Tennessee*, *supra* note 120.

129 *Id.* at 15–17.

130 *Id.* at 18 (arguing that intrastate water "is not a naturally shared natural resource; rather, it falls under the exclusive sovereignty of the state in which it resides").

131 *Id.* at 27 (emphasis added).

132 Docket No. 12, Mississippi v. Tennessee, No. 143 (U.S. Nov. 10, 2015), http://www.ca6.uscourts.gov/special-master. The Honorable Eugene E. Siler, Jr. was appointed Special Master in the case. Docket No. 17, Mississippi v. Tennessee, No. 143 (U.S. Nov. 10, 2015), http://www.ca6.uscourts.gov/special-master.

133 *See* Hall & Regalia, *supra* note 78, at 162 ("The Supreme Court's grant of leave suggests the Court will consider Mississippi's arguments of absolute ownership of the groundwater within its borders, or it presumably would have rejected this case like it did in 2010.").

merits of Mississippi's novel claims and resolve them "once and for all."[134]

Not only did Mississippi seek to distinguish surface water from groundwater, but it also sought to draw a line between two types of water within the Aquifer based on historical flow characteristics. Specifically, it asked the Court to distinguish between the *geologic formation* of the Aquifer (which it acknowledged underlies both Mississippi and Tennessee) and the hydrologic characteristics of the *groundwater* stored in the formation under natural conditions (which Mississippi argued was naturally "trapped" in a confined formation beneath the state).[135] Mississippi sought a declaratory judgment that the state "owned and continues to own all right, title and interest in groundwater *stored naturally* in the Sparta Sand formation underneath Mississippi's borders which does not cross into Tennessee under *natural predevelopment conditions*."[136] Mississippi asked the Court to declare that Tennessee was not entitled to pull out groundwater from beneath Mississippi by "artificial . . . means," and it alleged that any such pumping would constitute an actionable trespass, conversion, and misappropriation of Mississippi's property.[137]

2. The Defendants' Arguments—Rejecting Groundwater Exceptionalism

The defendants filed motions for judgment on the pleadings.[138] As in the previous litigation, Memphis continued to refute Mississippi's claim of groundwater ownership.[139] Because the Aquifer's *geologic formation* undisputedly underlies Mississippi, Tennessee, and other states, Memphis argued, the water is "interstate" water as a matter of law, and equitable apportionment is the appropriate remedy.[140] Memphis argued that the Court should rebuke Mississippi's attempt to "create a novel

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[134] Tennessee's Motion for Judgment on the Pleadings, *Mississippi v. Tennessee*, *supra* note 122, at 20. Defendant Tennessee speculated: "[T]here were strong prudential reasons for the Court to grant leave to file in 2014 and thereby facilitate resolution of Mississippi's claims 'on the merits.' . . . Indeed, while another order denying Mississippi leave to file would have left the door open for yet another future lawsuit based on the same claims, an order granting leave paves the way for the Court to dismiss those claims once and for all." *Id.*

[135] Complaint, *Mississippi v. Tennessee*, *supra* note 120, at 8, 14, 18. (emphasis added). Mississippi also acknowledges, however, that a portion of the Aquifer's water has naturally migrated across the state line since predevelopment times. *See id.* at Appendix 70a.

[136] *Id.* at 16 (emphasis added).

[137] *Id.* at 19–20.

[138] Memphis' Motion for Judgment on the Pleadings, *Mississippi v. Tennessee*, *supra* note 117.

[139] Tennessee's Motion for Judgment on the Pleadings, *Mississippi v. Tennessee*, *supra* note 122, at 32–35.

[140] Memphis' Motion for Judgment on the Pleadings, *Mississippi v. Tennessee*, *supra* note 117, at 3–4, 14.

cause of action as a means to extract money damages" from defendants, a remedy generally unavailable in equitable apportionment cases.[141]

Likewise, Tennessee—now added as a defendant to support the U.S. Supreme Court's original jurisdiction—rejected what it called the "territorial property rights theory," which it characterized as a theory seeking money damages "for every water molecule that has allegedly flowed across the border due to Memphis's pumping."[142] Criticizing Mississippi's attempt to create a new rule for groundwater, Tennessee explained:

> Mississippi identifies nothing unique about groundwater that would counsel such a result. True, Mississippi alleges that the groundwater is not part of a "river, stream or lake," . . . and that its movement is "exceedingly slow" . . . .But neither fact supports exempting the Aquifer from the doctrine of equitable apportionment. Under that "flexible doctrine" . . . there is nothing talismanic about the rate of speed at which a body of water flows, or its proximity to the surface.[143]

Citing *Kansas v. Colorado*, the case in which the Court first articulated the equitable apportionment doctrine,[144] Tennessee contended that equitable apportionment applies "whenever . . . the action of one state reaches, through the agency of natural laws, into the territory of another state."[145]

3. The United States' Position—Focus on Interstate Injury, Not Flow

In its brief as amicus curiae, the United States rejected Mississippi's assertion that the applicability of equitable apportionment "turn[s] on whether groundwater in the Aquifer would remain in Mississippi but for defendants' pumping."[146] Instead, the U.S. brief repeated *Kansas v. Colorado*'s admonition that equitable apportionment is the appropriate means to resolve the rights of competing states whenever "the action of one State reaches through the agency of natural laws into the territory of another State."[147] This is just such a case, the United States argued, because the pumping of wells within Tennessee creates "through the

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[141] *Id.* at 3–4.

[142] Tennessee's Motion for Judgment on the Pleadings, *Mississippi v. Tennessee*, *supra* 122, at 1.

[143] *Id.* at 2, 27 (quoting Colorado v. New Mexico, 459 U.S. 176, 183 (1982)).

[144] GETCHES, *supra* note 41, at 436 (asserting that equitable apportionment was announced in 1907 in *Kansas v. Colorado*).

[145] Tennessee's Motion for Judgment on the Pleadings, *Mississippi v. Tennessee*, *supra* note 122, at 18 (quoting *Kansas v. Colorado*, 206 U.S. at 97–98).

[146] United States' Amicus Brief, *Mississippi v. Tennessee*, *supra* note 121, at 13.

[147] *Id.* at 16 (quoting *Kansas v. Colorado*, 206 U.S. at 97–98).

natural principles of hydraulics, a cone of depression that causes groundwater to flow from Mississippi to Tennessee."[148] Because Mississippi relied on assertions of ownership and expressly disclaimed equitable apportionment, the United States concluded, the complaint did not state a cognizable cause of action and should be dismissed.[149]

4. The Special Master—A Potential Bifurcation of Aquifer and Water

The Special Master considered the defendants' motions for judgment on the pleadings and the United States' amicus brief in support of those motions.[150] He concluded that dismissal of Mississippi's complaint "would likely be appropriate" for failure to state a claim because Mississippi had failed to allege "that the [Aquifer] . . . *or* the water in it is not an interstate resource."[151] Nevertheless, out of an abundance of caution and a desire to develop a full record for the Supreme Court, the Master determined to hold an evidentiary hearing on the limited issue of "whether the Aquifer *and* the water constitutes an interstate resource."[152] The use of the disjunctive in the Master's tentative conclusion, and the conjunctive in the issue to be resolved, suggests that Mississippi need prove only that the geologic formation *or* the water within it does not cross state lines in order to assert ownership of the disputed groundwater.

The Special Master's memorandum evinced only a tepid rejection of Mississippi's sovereign ownership theory. The Master recounted that Mississippi had limited its claims to only a portion of the Aquifer's water—that which would allegedly never reach Tennessee but for Memphis' well pumping.[153] He acknowledged the "logical appeal" of Mississippi's argument that such water does not constitute "interstate water subject to equitable apportionment."[154] If not interstate water, then what would it be? Although the Master did not explain in detail, the seemingly inevitable conclusion would be that Mississippi could claim *ownership* of non-flowing (or slowly moving) groundwater in the

148 *Id.*

149 *Id.* at 2, 12–13.

150 Special Master's Memorandum, *Mississippi v. Tennessee*, *supra* note 120, at 7.

151 *Id.* at 1, 18, 35 (emphasis added).

152 *Id.* at 35–36 (emphasis added) (observing that special masters "have been advised to err on the side of over-inclusiveness in the record for the purpose of assisting the Court in making its ultimate determination").

153 *Id.* at 30. Mississippi claimed to "own" this water, as distinguished from "some groundwater collected and stored at a short stretch of the States' common border [that] would eventually naturally seep into Tennessee." *Id.*

154 *Id.* (suggesting "[i]f certain water would never travel outside a single state, then in some sense that water could be said to lack an interstate character").

Aquifer, but be required to share with Tennessee the *use* of other water flowing within that same geologic formation.

Resisting that temptation, the Master quoted as "more persuasive" the traditional prerequisite for equitable apportionment derived from *Kansas v. Colorado* and advanced by the defendants and the United States:

> [When] the action of one State reaches through the agency of natural laws into the territory of another State, the question of the extent and the limitations of the rights of the two states becomes a matter of justiciable dispute between them, and this court is called upon to settle that dispute in such a way as will recognize the equal rights of both and at the same time establish justice between them.[155]

Based on that directive, the Special Master concluded that Supreme Court precedent establishes a "functional approach" to the determination of whether water is subject to equitable apportionment. However, rather than rely on the Court's well-established *interstate injury* jurisdictional trigger for surface water, he added an additional jurisdictional prerequisite for groundwater—evidence that an *interstate resource* is at the heart of the interstate dispute. As the Master reasoned: "If a body of water is such that the removal of water within a State's borders can have a direct effect on the availability of water in another State, the resource is likely interstate in nature."[156] Accordingly, he formulated the "threshold question" to be determined at the evidentiary hearing as "whether the Aquifer is an interstate resource."[157]

Of potentially critical importance is the test that the Special Master will apply. Although he did not set forth a specific test, the Master suggested several factors that might be relevant. The evidence might address, for example, "the nature and extent of hydrological and geological connections between the groundwater in Memphis and that in Mississippi" and "the extent of *historical flows* in the Aquifer between Mississippi and Tennessee."[158] The reference to historical flows seems to mirror Mississippi's desired distinction between the Aquifer's geologic structure and the water that it contains.[159] Under that view, if Mississippi can demonstrate that groundwater did not naturally migrate into Tennessee before human development, then the Master seems to suggest that Mississippi might "own" that water and need not share it with Tennessee. Further, the Master intimates that lack of flow alone would be

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[155] *Id.* at 30 (quoting *Kansas v. Colorado*, 206 U.S. at 97–98).
[156] *Id.* at 31.
[157] *Id.* at 36.
[158] *Id.* (emphasis added).
[159] *See supra* notes 135–37 and accompanying text.

sufficient to establish Mississippi's ownership, even if Mississippi could not prove that the Aquifer's geologic structure itself was confined to one state.[160]

That suggestion, however, runs counter to the Supreme Court's statements in *Kansas v. Colorado.* As the Master explained in another portion of his memorandum:

> The Court indicated that the geological characteristics of a water resource are relevant to whether it should be considered interstate in nature, even going so far as to reject a claim that a river that periodically ran dry between two points in different States was "two rivers, one commencing in the mountains of Colorado and terminating at or near the state line, and the other commencing at or near the place where the former ends . . . ."[161]

The Special Master concluded, "no Supreme Court decision appears to have endorsed one State suing another State, without equitable apportionment, for the depletion of water that is part of a larger interstate resource by limiting its claims to a specific portion of the water."[162]

5. Conclusion: The Distorting Force of Ownership Rhetoric

This case invites the U.S. Supreme Court to decide whether equitable apportionment applies to groundwater. Throughout the course of litigation, the parties, judges, and Special Master have tentatively framed the issue in terms subtly different than traditional surface water apportionment cases. They have spent considerable time debating whether the disputed groundwater flowed across state lines without human intervention at the time Mississippi entered the Union; this inquiry is distinct from the interstate geographic characteristics of the Aquifer itself. Moreover, they have suggested that that *interstate flow*, rather than *interstate injury* might be an independent jurisdictional threshold, rather than simply one factor relevant to an equitable apportionment.

As a consequence of these analytical nuances, the parties have flirted with the notion that the water within a single Aquifer can be divided into two legal buckets—one filled with "intrastate" water owned by Mississippi and another filled with "interstate" water subject to

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160 The Special Master framed his tentative conclusion in the disjunctive, suggesting that Mississippi could prevail if it demonstrated at least one of two factors: "[T]he complaint appears to fail to plausibly allege that the Sparta Sand aquifer ('Aquifer') *or* the water in it is not an interstate resource." Special Master's Memorandum, *Mississippi v. Tennessee*, *supra* note 120, at 1 (emphasis added).

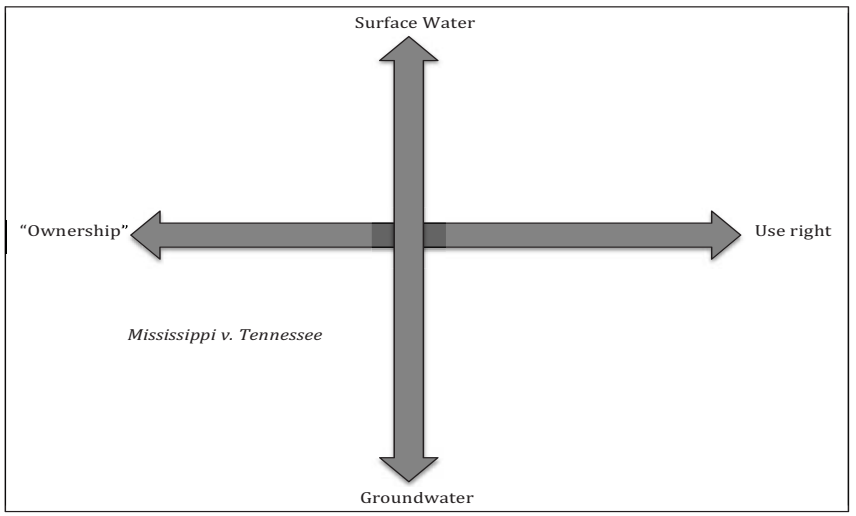
161 *Id.* at 31 (quoting *Kansas v. Colorado*, 206 U.S. at 115).

162 *Id.*

apportionment and sharing with neighboring states—even though both are contained within the same interstate geological formation.

Overall, *Mississippi v. Tennessee* lies at the intersection of two critical tensions in the law, as suggested in Figure 1. First, Mississippi seeks to draw a bright line between surface water and groundwater, contrary to the teaching of the hydrologic cycle. It argues for exceptional treatment of groundwater such that it would be exempt from sharing under the equitable apportionment doctrine as historically applied to surface water. At the same time, Mississippi conflates the property law distinction between possessory "ownership" rights and nonpossessory rights of "use." Ignoring the unique physical nature of water and a long legal tradition recognizing water rights as "usufructuary" only, Mississippi claims that it "owns" particular water molecules that lay beneath its territory at the time of statehood. By distorting both property law and water law, Mississippi seeks hundreds of millions of dollars against neighboring Tennessee.

Figure 1



III. THE BROADER CONTEXT—USE AND OWNERSHIP IN PROPERTY LAW

This Part places the use-ownership tension in the broader context of traditional property law. It begins by showing that "ownership" is an imprecise and conclusory label. It is a broad descriptor that begins the discussion, but requires much more analysis to unpack the richness of its meaning in any particular situation. Overall, this Part suggests that

traditional property law undermines Mississippi's broad vision of groundwater ownership, and weakens its claim that groundwater is not subject to equitable apportionment by the Court.

A. "Ownership"—A Word in Search of a Meaning

What does it mean to own property? Jurists, scholars, and generations of first-year law students have long struggled with this question. One common starting point is William Blackstone's eighteenth century definition of property as "that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe."[163] However, Blackstone's hyperbolic definition is generally rejected as a useful framework for the analysis of actual cases.[164] As renowned legal scholar Felix Cohen suggested, "Property in the Blackstonian sense doesn't actually exist."[165]

Instead, modern law regards "property" as a relational concept that establishes rights and duties among people with respect to things.[166] As Cohen reasoned, "the idea of property as a dyadic or two-termed relation between a person and a thing" breaks down in favor of the view that property "essentially involves relations between people."[167] Cohen regarded the right to exclude others as the key element of these relationships: "Private property may or may not involve a right to use something oneself. It may or may not involve a right to sell, but whatever else it involves, it must at least involve a right to exclude others from doing something."[168] Although Cohen settled on what he described as "a realistic definition of private property in terms of exclusions which individuals can impose or withdraw with state backing against the rest of society,"[169] he acknowledged that any generalized definition of "property" necessarily fails to "remove the penumbra of ambiguity that attaches to every word that we use in any definition."[170]

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163 CHRISTINE A. KLEIN, PROPERTY: CASES, PROBLEMS, AND SKILLS 30–31 (Aspen 2016) (quoting WILLIAM BLACKSTONE, COMMENTARIES ON THE LAWS OF ENGLAND 2 (1765–1769)).

164 Felix Cohen, *Dialogue on Private Property,* 9 RUTGERS L. REV. 357, 378 (1954).

165 *Id.* at 362.

166 KLEIN, PROPERTY, *supra* note 163, at 5.

167 Cohen, *supra* note 164, at 378.

168 *Id.* at 370–71.

169 *Id.* at 378.

170 *Id.* at 374.

B. Property as Metaphor

Consistent with Cohen's line of analysis, the metaphor of property as a "bundle of sticks" gained prominence through the work of Yale law professor Wesley Newcomb Hohfeld and others.[171] Under the bundle metaphor, ownership entitles one to exercise a variety of rights depending on the nature of the subject property. These rights include the right to possession, the right to use, the right to transfer, the right to destroy, and the right to exclude others.[172]

Regardless of the exact sticks in any particular bundle, the bundle itself comprises "property." For example, suppose a physician prescribes a medication to a patient. The patient can use that medication, destroy that medication, or exclude others from using that medication. However, under relevant law, patients cannot sell or give away prescription drugs to others.[173] Despite those missing sticks, it would nevertheless be accurate to say that the patient "owns" the bottle of pills. Similarly, a person "owns" her body and the organs within it. As a result, the person can possess and use her organs, give them away (by making an effective organ donation), destroy them (as by following an unhealthy lifestyle), and exclude others from them (by refusing surgery to remove a diseased spleen, for example).[174] However, federal law generally forbids the selling of organs to others, fearing negative consequences that could flow from a free market in organs.[175] Finally, suppose two people own a commercial property together as tenants in common. Although each holds an undivided right to use the entire property, neither can exclude the other from the premises.[176]

As these examples suggest, "use" and "ownership" are not interchangeable or synonymous. Rather, the right of use is a subset of ownership. As Justice Cardozo explained: "The privilege of use is only one attribute, among many, of the bundle of privileges that make up property or ownership. A state is at liberty, if it pleases, to tax them all

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171 KLEIN, *supra* note 163, at 30–31. The phrase "bundle of rights" has been attributed by some to JOHN LEWIS, A TREATISE ON THE LAW OF EMINENT DOMAIN IN THE UNITED STATES 57 (1888) ("The dullest individual among the people knows and understands that his property in anything is a bundle of rights.").

172 KLEIN, *supra* note 163 at 31.

173 Under federal law, the Controlled Substances Act makes it illegal to give or sell certain substances to others. 21 U.S.C. § 801 *et seq.*

174 *See, e.g.*, Moore v. Regents of the University of California, 793 P.2d 479 (Cal. 1990), *cert. denied*, 499 U.S. 936 (1991).

175 KLEIN, *supra* note 163, at 37 (discussing the prohibition on organ sales contained in 42 U.S.C. § 274e). *See also Moore*, 793 P.2d at 509 n.2 (Broussard, J., concurring and dissenting).

176 *See, e.g.*, Spiller v. Mackereth, 334 So. 2d 859 (Ala. 1976) (holding one cotenant's use and possession of commercial warehouse was proper, absent a showing of "ouster" against the other cotenant). *See generally* KLEIN, *supra* note, at 163 (discussing the unity of possession and ouster).

collectively, or to separate the faggots [sticks] and lay the charge distributively."[177] This lack of equivalence runs counter to the plaintiff's claims in *Mississippi v. Tennessee*. Mississippi asserts that it "owns" certain slowly moving groundwater residing beneath it. But under property doctrine, Mississippi's claim of ownership does little to resolve the fundamental issues of the dispute. Still unanswered are questions regarding the extent to which Mississippi can use water from the Memphis-Sparta Aquifer, and the extent to which it can exclude Tennessee from using that water.

Despite its appeal, the bundle metaphor has attracted its share of detractors. Some critics worry that it is a misguided view that dignifies "any distribution of rights and privileges among persons with respect to things . . . with the [almost meaningless] label 'property.'"[178] Instead, they argue for the prominent treatment of *the thing* at stake:

> Far from being a quaint aspect of the Roman or feudal past, the in rem character of property and its consequences are vital to an understanding of property as a legal and economic institution. Because core property rights attach to persons only through the intermediary *of some thing*, they have an impersonality and generality that is absent from rights and privileges that attach to persons directly. When we encounter a thing that is marked in the conventional manner as being owned, we know that we are subject to certain negative duties of abstention with respect to that thing—not to enter upon it, not to use it, not to take it, etc. And we know all this without having any idea who the owner of the thing actually is. In effect, these universal duties are broadcast to the world from the thing itself.[179]

Other critics of the bundle metaphor worry that it gives short shrift to the underlying human values and social relationships fostered by property:

> The common conception of property as protection of individual control over valued resources is both intuitively and legally powerful . . . .However, internal tensions within this conception and the inevitable impacts of one person's property rights on others make it inadequate as the sole basis for resolving property conflicts . . . .For [that] task, we must look to the underlying

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177 KLEIN, *supra* note 163, at 31 (quoting Henneford v. Silas Mason Co., 300 US. 577, 582 (1936)).

178 Thomas W. Merrill & Henry E. Smith, *What Happened to Property in Law and Economics?*, 111 YALE L.J. 357 (2001). Felix Cohen acknowledged this possibility too. *See* Cohen, *supra* note 164, at 374 ("Any definition of property, to be useful, must reflect the fact that property merges by imperceptible degrees into government, contract, force, and value.").

179 Merrill & Smith, *supra* note 178, at 359. (emphasis added).

> human values that property serves and the social relationships it shapes and reflects . . . .Values promoted by property include life and human flourishing, the protection of physical security, the ability to acquire knowledge and make choices, and the freedom to live one's life on one's own terms. They also include wealth, happiness, and other aspects of individual and social well-being.[180]

Responding to these calls for a robust consideration of both the "thing" and the human relationships at stake, Professor Tony Arnold has likened property to a "web of interests" rather than to a bundle of rights.[181] In his view, property should be viewed "as an interconnected web of relationships between people and an object, and among people."[182]

Like the bundle metaphor, the web metaphor offers little support for Mississippi's position. It calls for a careful look at the "thing" subject to ownership claims. Water, unlike most things described as "property," is a migratory resource that moves from place to place—whether under the force of gravity or as a consequence of the siphoning effect of well pumping.[183] As a result, property rights in water are difficult to categorize. As the Colorado Supreme Court explained:

> [A water right] gives its holder a special type of property right. The value of the property right is that it allows a priority to the use of a certain amount of water at a place somewhere in the hierarchy of users who also have rights to water from a common source such as a lake or river. There has been some confusion, however, over the nature of the property right to water.
>
> Water rights have been characterized as a freehold, as an interest in real estate, as a property right lacking the dignity of an estate in fee, as personal property, and perhaps most accurately as a "usufructuary" right.[184]

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180 Gregory S. Alexander et al., *A Statement of Progressive Property*, 94 CORNELL L. REV. 743 (2009).

181 Craig Anthony Arnold, *The Reconstitution of Property: Property as a Web of Interests*, 26 HARV. ENVTL. L. REV. 282, 364 (2002).

182 *Id.*

183 *See supra* note 38 and accompanying text.

184 Navajo Dev. Co. v. Sanderson, 655 P.2d 1374, 1377 (Colo. 1982) (citations omitted). This treatment of water rights as "usufructuary" is widespread. *See also* Spear T Ranch, Inc. v. Knaub, 691 N. 2d 116, 127 (Neb. 2005) (opining that a "right to appropriate surface water is not an ownership of property" but rather "a right to use the water"); Village of Tequesta v. Jupiter Inlet Corp., 371 So. 2d 663 (Fla.), *cert. denied,* 444 U.S. 965 (1979) (asserting, that "[t]he right of the [landowner] to ground water underlying his land is to the usufruct of the water and not to the water itself," and thus, "the term 'ownership' as applied to percolating water never meant that the overlying owner had a property or proprietary interest in the corpus of the water itself").

The court elaborated further on the nature of such "usufructuary" water rights, suggesting that they give their holders the right to beneficially use and enjoy water without impairing or destroying the resource because "the water molecules are not altered by the use of the water."[185] As the court concluded, the "uncertain nature of the property right in water is evidence that its primary value is in . . . the right to use the resource and not in the continuous tangible possession of the resource."[186] This view that property rights in water are unique usufructuary rights is widely accepted.[187] Drawing more broadly on traditional property concepts, this usufructuary water right can perhaps best be situated in the hierarchy of property rights as a nonpossessory interest.

C. Distinguishing Use from Ownership—Nonpossessory Property Rights

"Possessory" interests give their holders the right of exclusive occupation.[188] As one treatise explains, this means "that the possessor may wholly exclude all others from all parts of the land, without having to show they will actually interfere with any aspect of use and enjoyment."[189] Possessory estates of the "freehold" variety—the stuff of first-year property units on estates and future interests—are loosely associated with full "title" or "ownership."[190] Possessory estates can also be of the "nonfreehold" variety, finding their modern counterpart in the variety of leasehold interests held by tenants.[191]

Property law also recognizes "nonpossessory" rights, which fall short of full title or ownership. Nonpossessory rights include easements, profits, and running covenants—collectively known as "servitudes."[192] These types of interests enjoy only a limited right to exclude others,

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185 *Navajo*, 655 P.2d at 1377.

186 *Id.*

187 *See infra* Part IV.C.

188 WILLIAM B. STOEBUCK & DALE A. WHITMAN, THE LAW OF PROPERTY § 8.1 (3d ed. 2000).

189 *Id.*

190 *Id.* (explaining rights of possession convey "full rights," including "all kinds of use and enjoyment that the law allows"). BLACK'S LAW DICTIONARY (defining "freehold estate" as a "right of *title* to land") (emphasis added).

191 *See* KLEIN, PROPERTY, *supra* note 163, at 131 (explaining that a nonfreehold estate "is an interest in real property that does not include seisin, and is of interest today primarily in the context of landlord-tenant law"). *See also* BLACK'S LAW DICTIONARY (defining "possessory interest" as "[r]ight to possess property by virtue of an interest created in the property though it need not be accompanied by title; *e.g.*, right of a tenant for years").

192 *See* KLEIN, PROPERTY, *supra* note 163, at 490, 546 (describing easements and running covenants as "nonpossessory" interests); STOEBUCK & WHITMAN, *supra* note 188, at § 8.1 (classifying easements and profits as nonpossessory rights, whereas licenses are mere privileges that do not rise to the level of a right).

extending only so far as to prevent interference with the servitude's particular purpose.[193]

By describing private interests in water as "usufructuary" rights,[194] courts and commentators implicitly locate them within the realm of nonpossessory property rights. As such, they implicate something less than full title or ownership, with only a limited right to exclude consistent with the scope of the use right. In *Mississippi v. Tennessee*, the plaintiff's claim of groundwater "ownership" can be seen as an inaccurate and inflated characterization of Mississippi's interest in the water beneath it. Labels aside, reviewing courts must first determine the scope of Mississippi's right to use (as through an equitable apportionment) before they can determine whether Tennessee has infringed on that right.

IV. THE IMPLICATIONS OF WATER OWNERSHIP

This Part considers the distinction between owning water and using water, concluding that claims of water ownership by the states—including those of the plaintiff in *Mississippi v. Tennessee*—are better recognized as overblown references to the states' authority to *regulate the use* of water within their borders. Likewise, private ownership claims are more accurately articulated as usufructuary rights recognized and constrained by state water rights law. Further, this Part reveals that the law's dalliance with water ownership has gained more traction in the context of underground, rather than surface, water.

A. A Cautionary Tale—The Ad Coelum Doctrine

In many respects, water finds a natural counterpart in air. Each is ever moving and life sustaining. Each is limited to a precious and finite number of molecules recycled throughout time. A drop of water in a glass today might have passed through the body of a woolly mammoth hundreds of thousands of years ago.[195] Likewise, one's next breath might draw in a molecule of air that sustained Julius Caesar some two thousand years ago.[196] The Institutes of Justinian captures this affinity between water and air through its declaration: "And truly by natural right these be

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193 STOEBUCK & WHITMAN, *supra* note 188, at § 8.1.

194 *See, e.g.*, *supra* note 184 and accompanying text.

195 *See supra* note 48 and accompanying text.

196 Physicists have long posed the classic "Fermi problem" to their students, based on a simplified "order of magnitude estimation" problem developed by prominent physicist Enrico Fermi (1901–1954): "When you take a single breath, how many molecules of gas you intake would have come from the dying breath of Caesar?" Tong Shiu-sing & Hui Pak-ming, *The Last Breath of Caesar*, PHYSICS WORLD (last visited Mar. 3, 2017), http://www.hk-phy.org/articles/caesar/caesar_e.html.

common to all: the air, the running water, and the sea, and hence the shores of the sea."[197] That declaration gave rise to the public trust doctrine, which establishes that states hold the beds of certain water bodies and the waters above in trust for the benefit of all their citizens, and must protect those resources accordingly.[198] The public trust doctrine recognizes that water, like air, fits poorly within traditional property concepts. And yet, a competing common law doctrine did indeed suggest that far-flung private property rights attach to Earth's atmosphere and underground water. According to the *ad coelum* doctrine, "To whomsoever the soil belongs, he owns also to the sky and to the depths."[199]

Such extravagant pretentions of ownership, at least in the context of the atmosphere, eventually confronted modern realities. In the 1946 case *United States v. Causby*,[200] the U.S. Supreme Court was asked to determine whether frequent low altitude flights of military bombers and fighter planes constituted a compensable taking of the private property below. The dispute pitted potential national security interests at the end of World War II against a sympathetic family who suffered loss of their commercial chicken farm and experienced fright and sleep deprivation as a consequence of the flights.[201] In the Court's holding, Justice Douglas' majority opinion concluded that the *ad coelum* doctrine "has no place in the modern world" and that Congress had instead declared the airspace as a public highway.[202] To continue to recognize the *ad coelum* doctrine would be to "transfer into private ownership that to which only the public has a just claim."[203] Accordingly, the Court narrowed private property rights in airspace to "as much of the space above the ground as [the

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197 *See* KLEIN ET AL., NATURAL RESOURCES LAW, *supra* note 67, at 628 (identifying the Institutes of Justinian as a Roman law treatise codified around A.D. 528).

198 *See, e.g.*, Illinois Central Railroad Co. v. Illinois, 146 U.S. 387 (1892) ("The state can no more abdicate its trust over property in which the whole people are interested, like navigable waters and soils under them, so as to leave them entirely under the use and control of private parties, . . . than it can abdicate its police powers in the administration of government and the preservation of the peace.").

199 BLACK'S LAW DICTIONARY (translating "cujus est solum, ejus est usque ad coelum et ad infernos" and explaining that the "owner of a piece of land owns everything above and below it to an indefinite extent").

200 328 U.S. 256 (1946).

201 As the Court explained, the frequent flights, "come close enough at times to appear barely to miss the tops of the trees and at times so close to the tops of the trees as to blow the old leaves off. The noise is startling. And at night the glare from the planes brightly lights up the place . . . As many as six to ten of [respondents'] chickens were killed in one day by flying into the walls from fright . . . Although there have been no airplane accidents on respondents' property, there have been several accidents near the airport and close to respondents' place." *Id.* at 259.

202 *Id.*

203 *Id.* at 260–61.

underlying landowners] can occupy or use in connection with the land," such that landowners retain "exclusive control of the immediate reaches of the enveloping land."[204] Although the Court declined to define the "precise limits" of landowners' airspace rights, it held that they had indeed been "taken" under the facts of the case.[205] Dissenting, Justice Black would have further curtailed the doctrine of *ad coelum*. He complained that "[o]ld concepts of private ownership of land should not be introduced into the field of air regulation."[206]

Causby provides a cautionary tale. By leaving some relicts of the *ad coelum* doctrine intact, the Court failed to supply a legal framework capable of resolving future conflicts, such as those posed by the increasingly widespread use of low-flying drones.[207] As the next sections consider, similar sweeping and abstract assertions of ownership have also infected the law governing water use.

B. State Ownership Claims

1. The Context

The *Causby* saga illustrates that broad proclamations of title to air and water—in that case, by private landowners—are rarely helpful in resolving significant disputes. Nevertheless, states have fallen prey to just that temptation. Through constitutional and statutory provisions, many states purport to "own" the waters within their territory. By one count, the laws of seventeen western states included such provisions as early as 1957.[208] These provisions variously claim water as the property of the *public*, of the *state*, of *the people of the state*, or simply dedicate it to *the use of the people of the state*.[209] Colorado's constitution is representative. In Article 16 § 5 it proclaims: "The water of every natural stream, not

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[204] *Id.* at 264–65.

[205] *Id.* at 266–67 ("The findings of the Court of Claims plainly establish that there was a diminution in value of the property and that the frequent, low-level flights were the direct and immediate cause. We agree with the Court of Claims that a servitude had been imposed upon the land.").

[206] *Id.* at 274.

[207] Congress has been slow to regulate the use of drones. In light of that regulatory void, some have called for the revitalization and clarification of low-altitude property rights, while others have called for the establishment of a congressionally regulated commons, unencumbered by poorly defined property rights of the landowners below. *See, e.g.*, Kenneth Maher, *Flying Under the Radar: Low-Altitude Local Drone Use and the Reentry of Property Rights*, 15 DUKE L. & TECH. REV. 102, 118–20 (2017); Troy A. Rule, *Airspace in an Age of Drones*, 95 B.U. L. REV. 155 (2015).

[208] Frank J. Trelease, *Government Ownership and Trusteeship of Water*, 45 CAL. L. REV. 638, 641–43 (1957) (discussing legal expressions of state "ownership" in Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Texas, Washington, and Wyoming).

[209] *Id.* at 641–43.

heretofore appropriated, within the state of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation as hereinafter provided."[210] Traditional western assertions of water ownership have been joined by more recent declarations by both eastern and western states. Of potential relevance to *Mississippi v. Tennessee*, the Mississippi legislature enacted a statute in 1985 that declares all surface and groundwater resources "belong to the people" of the state.[211]

A review of the judicial opinions citing such provisions, however, suggests that they rarely affect the outcome of particular cases. Rather, the provisions are often cited in *dicta*, supporting holdings that could have been reached without reliance on state "ownership."[212] In an interstate conflict, for example, Colorado justified its funding of an investigatory committee on the ground that the expense was warranted to protect Colorado's property.[213] In a dispute between a state and one of its citizens, Wyoming justified its regulation of water users through a permit system on the basis that it owned the water and could therefore regulate the terms of its use.[214] In a lawsuit between two Nevada citizens, the Nevada courts declined to apply a provision of statutory law that would have caused the forfeiture of one citizen's water rights, but nevertheless upheld the legislature's authority to enact the provision because the water is Nevada's property.[215] Arguably, each such case could have been resolved narrowly on a basis independent of water ownership.

Legal scholars have long taken broad ownership claims with a grain of salt, viewing them as the simple assertion that states possess the authority to regulate water use within their borders. As Frank Trelease, recognized as the "undisputed dean" of water law,[216] humorously explained:

> Why then do we continue to use words such as "ownership"? . . . There *is* magic in causing our hearers to think what we think, to take our words in the sense we say them. But we do not *create*

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210 COLO. CONST. art. 16, § 5.

211 The statute provides, "All water, whether occurring on the surface of the ground or underneath the surface of the ground, is hereby declared to be among the basic resources of this state to therefore belong to the people of this state, and is subject to regulation in accordance with the provisions of this chapter. The control and development and use of water for all beneficial purposes shall be in the state, which, in the exercise of its police powers, shall take such measures to effectively and efficiently manage, protect and utilize the water resources of Mississippi." MISS. CODE ANN. § 51-3-1 (1985 & 2006 Supp.).

212 Trelease, *supra* note 208, at 644.

213 *Id.* at 643 (citing Stockman v. Leddy, 129 P. 220 (Colo. 1912)).

214 *Id.* at 644 (citing Wyoming Hereford Ranch v. Hammond Packing Co., 236 P. 764 (Wyo. 1925)).

215 *Id.* at 644 (citing *In re* Manse Spring, 108 P.2d 311, 315 (Nev. 1940)).

216 Joseph L. Sax, *Tribute to Frank J. Trelease*, 22 LAND & WATER L. REV. 295, 295 (1987).

> anything by this magic. It must always be remembered that when we say "alakazam," or "state ownership" . . . no genie out of a bottle brings us a beautiful maiden draped in pearls, and no magical solution is provided for difficult problems . . . in the complex field of development of water resources.[217]

Trelease concluded, "State ownership means that the state has power to control the allocation of water rights by permits, that the state may adjudicate rights among appropriators, that it may take an active part in seeing that the water laws are obeyed, and that it may enact forfeiture laws."[218] Modern commentators have reached a similar conclusion, explaining that the state ownership theory is but "a fiction for the assertion of the power to regulate all aspects of use and enjoyment rather than an assertion of full ownership."[219]

Although the U.S. Supreme Court has presided over nine interstate water allocation disputes, it has only equitably apportioned three rivers: the Laramie, Delaware, and North Platte Rivers.[220] Through both its analysis and remedy, the Court made clear in each case that interstate disputes should be resolved by the allocation of use rights among competing states, not by the division of a watercourse into separately owned property rights. The Court, for example, apportioned the Laramie River in its 1922 decision *Wyoming v. Colorado*.[221] In so doing, it explicitly rejected Colorado's ownership-based claims:

> The contention of Colorado that she as a state rightfully may divert and use, as she may choose, the waters flowing within her boundaries in this interstate stream, regardless of any prejudice that this may work to others having rights in the stream below her boundary, cannot be maintained. The river throughout its course in both states is but a single stream, wherein each state has an interest which should be respected by the other.[222]

Accordingly, the Court's remedy determined each state's respective right of use. After engaging in a careful and detailed analysis of flows in

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217 Trelease, *supra* note 208, at 653–54 (emphasis in original).

218 *Id.* at 648.

219 Dan Tarlock, *Takings, Water Rights, and Climate Change*, 36 VT. L. REV. 731, 740 (2012). *See also* Hall & Regalia, *Interstate Groundwater Law Revisited*, *supra* note 78, at 185 ("The conclusion to be drawn from the Court's modern jurisprudence is clear and simple: states do not own water, neither by royal prerogative nor on behalf of their citizens. Instead, states can regulate how their citizens use water and other wild resources."); Amy K. Kelley, *"Ownership" of Water*, *in* ROBERT E. BECK, WATERS AND WATER RIGHTS § 36.02 (Amy K. Kelley ed., LexisNexis 2017) (discussing the "futility of debating 'ownership'" when "the real issue is the right to the control or use of water").

220 *See* supra notes 9–18 and accompanying text.

221 259 U.S. 419 (1922).

222 *Id.* at 466.

the Laramie River, as well as a number of equitable and historic factors, the Court issued a decree limiting Colorado's upstream use of the river to a specific annual volume of water, without any reference to portions of the river "owned" by either state.[223] Even when declining to apportion a watercourse upon which more than one state relies, the Court does so because the complaining state failed to demonstrate sufficient interstate injury to warrant the Court's intervention, not because a portion of the water is owned by one of the states and thus not amenable to sharing.[224]

2. The Implications

Why does it matter whether the Court divides a disputed watercourse into ownership rights rather than use rights? The ownership approach would needlessly complicate existing law. The Court has already begun to adapt the century-old equitable apportionment doctrine to accommodate some interests in groundwater using concepts of use, not ownership.[225] Moreover, it is hard to imagine how a court would go about designating specific ownership rights to the water within an aquifer, no matter how slowly it might be flowing. As defendant Tennessee worried in *Mississippi II*, "The hydrological complexity of Mississippi's theory reinforces the point. Mississippi asks the Court to determine ownership of each molecule of water in the Aquifer by determining whether it would

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[223] *Id.* at 496 (determining the river's annual available supply to be 288,000 acre-feet, and allocating no more than 15,500 acre-feet annually to upstream Colorado). The Court subsequently vacated the former decree of apportionment and entered a new decree, but did not repudiate the basic premises on which it had previously relied. *See* Wyoming v. Colorado, 353 U.S. 953, 953 (1957) (allocating to Colorado the right to use 49,375 acre-feet of water annually from the Laramie River and its tributaries, leaving to Wyoming "the right to divert and use all water flowing and remaining" in the river after diversion and use in Colorado). In its other two apportionments, the Court likewise allocated use rights among the competing states. *See* New Jersey v. New York, 347 U.S. 995, 996–97 (1954) (setting maximum number of gallons per day New York may divert and use from the Delaware River and its tributaries, before it flows downstream along the Pennsylvania border and into New Jersey); Nebraska v. Wyoming, 325 U.S. 589, 665 (1945) (apportioning the North Platte River among Colorado, Wyoming, and Nebraska).

[224] *See* Kansas v. Colorado, 206 U.S. 46, 117–18 (1907) (declining to apportion the Arkansas River and dismissing Kansas' complaint "without prejudice to the right of the plaintiff to institute new proceedings whenever it shall appear that, through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river").

[225] As the Fifth Circuit noted in *Mississippi I*, "[a] handful of Supreme Court cases mention aquifers in the context of interstate water disputes . . . .While these opinions do not address aquifer allocation directly, the fact that the aquifers were not treated differently from any other part of the interstate water supply subject to litigation supports the conclusion that the Aquifer at issue must be apportioned." *Hood*, 570 F.3d at 630–31.

have 'resided in Mississippi' under 'natural conditions.'"[226] Noting the difficulty and inexactness of modeling historic flows, Tennessee concluded, "it is especially challenging here because Mississippi's theory depends on reconstructing the 'natural' state of the Aquifer in the nineteenth century prior to pumping."[227]

In addition, Mississippi's ownership theory would turn interstate water law on its head. Instead of traditional injunctive and apportionment remedies, states would be exposed retroactively to millions or billions of dollars of liability for past groundwater pumping.[228] Although the Court has awarded damages retroactively in interstate water disputes through "disgorgement," it has done so only after each state's respective right of use has been determined by judicial decree or agreement.[229] Mississippi's purported substitution of damages for injunction and apportionment would chill water use unless states adopt a costly and time-consuming "litigate first, use later" approach. Overall, it would likely prove unworkable to recognize a bifurcated system that applies the equitable apportionment doctrine to surface water, and that awards money damages in groundwater disputes for, in the words of Tennessee, "every water molecule that has allegedly flowed across the border" due to pumping in a neighboring state.[230]

C. Private Ownership Claims

State water law regulates the conditions under which private landowners and others can acquire the right to use water from sources like rivers, lakes, and aquifers. Water law varies from state to state. Moreover, many states subject surface water and groundwater to distinct legal regimes. Overall, though, there is a broad consensus that virtually all water rights under state law constitute usufructuary rights only—the right to put water to reasonable or beneficial use under specifically defined parameters—and do not confer a possessory property interest in the corpus of the water itself.[231] In defiance of this majority position,

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[226] Tennessee's Motion for Judgment on the Pleadings, *Mississippi v. Tennessee*, *supra* note 122, at 33.

[227] *Id.*

[228] *See supra* Part II.C.1.

[229] *See, e.g.*, Kansas v. Nebraska, 135 S. Ct. 1042, 1064 (2015) (upholding order requiring Nebraska to disgorge $1.8 million, representing portion of the state's gain from its breach of an interstate agreement with Kansas by using 17 percent more water than its "proper share").

[230] Tennessee's Motion for Judgment on the Pleadings, *Mississippi v. Tennessee, supra* note 122, at 1.

[231] *See, e.g.*, Dave Owen, *Taking Groundwater*, 91 WASH. U. L. REV. 253, 282 n.180 (2013) (asserting that most states' systems of water suggest "that constitutionally protected property interests in water exist, but those interests take the form of use rights rather than of direct ownership of the physical water"); Joseph W. Dellapenna, *The Rise and the Demise of the Absolute Dominion*

however, a few jurisdictions continue to recognize something akin to an "ownership" right in the water itself, hearkening back to the old *ad coelum* doctrine. This exceptional treatment is generally confined to groundwater rather than surface water.[232]

1. The Context

With respect to the use of surface water, the wetter eastern half of the country generally follows a common law doctrine known as riparianism, under which those whose property abuts a natural watercourse have the right to put the water to "reasonable use."[233] These rights arise by virtue of land ownership, and do not require any particular permit or license from the state.[234] Landowners cannot know the precise amount of water to which they are entitled until their use has been tested against the competing claim of another. Even then, reviewing courts will determine each party's permitted use under current circumstances only. Thus, riparian rights are relatively insecure, giving landowners no assurance that current uses will not be declared "unreasonable" at some future point in time when competing users might bring a lawsuit against them. Increasingly, states have supplemented or supplanted common law riparian rights with a more comprehensive statutory permit system.[235] Numerous cases have made clear that surface riparian water rights do not implicate full possessory property rights; they are imprecise "usufructuary rights" that vary under the circumstances. As the Tennessee Court of Appeals stated: "A riparian does not own the water in a watercourse, but merely has the right to use it."[236]

Doctrine for Groundwater, 35 U. ARK. LITTLE ROCK L. REV. 291 (2013); Shelley Ross Saxer, *The Fluid Nature of Property Rights in Water*, 21 DUKE ENVTL. L. & POL'Y F. 49, 53 (2010) (explaining, "water rights are generally viewed not as actual property rights . . . but as usufructuary rights, or a license from the state or federal government"); Sandra B. Zellmer & Jessica Harder, *Unbundling Property in Water*, 59 ALA. L. REV. 679, 693–94, 697–98, 743 (2008) (tracing the usufructuary concept under both eastern and western water law doctrines and describing usufructuary interests as "an elemental strand within the web of interests [that] are non-exclusive and not irrevocable").

232 *See infra* notes 249–65 and accompanying text.

233 The "hundredth meridian" is said to be the dividing line between eastern and western water law systems. This is the longitudinal line that passes through North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas. *See* KLEIN ET AL., NATURAL RESOURCES LAW, *supra* note 67, at 863–64.

234 *See* GETCHES, *supra* note 41, at 4–6.

235 *Id.* at 58–61.

236 Keltner v. Open Lake Sporting Club, No. W2002-00449-COA-R3-CV, 2003 Tenn. App. LEXIS 128, 2003 WL 346932 (Tenn. Ct. App. Feb. 12, 2003). *See also* Village of Tequesta v. Jupiter Inlet, 371 So. 2d 663 (Fla. 1979), *cert. denied*, 444 U.S. 965 (1979) (explaining that the rights of landowners to groundwater beneath their property "is to the usufruct of the water and not to the water itself").

In contrast to the eastern states, the drier western states follow the doctrine of "prior appropriation" for the allocation of surface water rights. Under this system, temporal priority is the lodestar; the first person to put water to "beneficial use" has a better right than all subsequent appropriators from the same source. The first user is entitled to divert the full measure of his or her water right before subsequent users are entitled to a single drop—a marked departure from the riparian practice of sharing the loss among all water users in times of shortage.[237] Like their eastern counterparts, the western states make clear that surface water rights are usufructuary only. Thus, although state sanctioned water rights constitute a type of property, they confer no right to ownership of the corpus of the water itself.[238]

Separate from the surface water doctrines they follow, the states must also determine what groundwater regime to apply. This separation of surface and groundwater systems was originally rooted in a lack of knowledge about groundwater, and typically reflected a reluctance to regulate groundwater use.[239] As one commentator complains, "States have acted, whether legislatively or administratively, in a highly fragmentary, piecemeal manner, ignoring the interconnections between groundwater and other water moving through the hydrologic cycle."[240] Today, perhaps most states regard groundwater as a *public resource* and confer rights to its use through state permits.[241] Mississippi, for example, has a statutory permit system that covers both surface water and groundwater use.[242] In such jurisdictions, water rights are usufructuary,

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237 *See* GETCHES, *supra* note 41, at 77–80.

238 *See, e.g.*, Kobobel v. Colorado Dep't of Natural Res., 249 P.3d 1127, 1134 (Colo. 2011) ("A water right is a usufructuary right, giving its holder the right to use and enjoy the property of another without impairing its substance. Thus, one does not 'own' water but owns the right to use water within the limits of the prior appropriation doctrine.") (internal citations omitted); Spear T. Ranch, Inc. v. Knaub, 691 N.W.2d 116, 127 (Neb. 2005) (declaring that the "right to appropriate surface water . . . is not an ownership of property" but instead is "a right to use the water"); Eddy v. Simpson, 3 Cal. 249, 252 (Cal. 1853) ("It is laid down by our law writers, that the right of property in water is usufructuary, and consists not so much of the fluid itself as the advantage of its use.").

239 *See supra* notes 62–63 and accompanying text. *See also* Joseph L. Sax, *We Don't Do Groundwater: A Morsel of California Legal History*, 6 U. DENV. WATER L. REV. 269 (2003) (discussing modern reasons why California resisted the regulation of groundwater).

240 Joseph W. Dellapenna, *Quantitative Groundwater Law*, *in* ROBERT E. BECK, WATER AND WATER RIGHTS § 19.03 (Amy K. Kelley ed. 2017).

241 GETCHES, *supra* note 41, at 273–74 ("Most states recognize no private ownership rights in groundwater and consider it subject to management as public property."); Joseph W. Dellapenna, *A Primer on Groundwater Law*, 49 IDAHO L. REV. 265, 303–10 (2013) (discussing twenty-four states that have enacted "regulated riparian" permit systems in some form).

242 MISS. CODE ANN. §§ 51-3-1 to 51-3-55 (1985). *See generally* WATERS AND WATER RIGHTS § 23.02(a.01) (Amy K. Kelley, ed. 2017).

and do not constitute full possessory rights.[243] In a second group of jurisdictions, groundwater is regarded as *common property*, and the overlying landowners are entitled to make "reasonable use" of the resource, sometimes dependent on the quantity of overlying land that they own.[244] These jurisdictions, like surface water regimes, generally regard water rights as nonpossessory usufructuary rights.[245] A third group of states apply a modified version of the prior appropriation doctrine to groundwater.[246] Although the appropriative right of use is considered a type of *private property*, it is ultimately a nonpossessory usufructuary right.[247]

Apart from the vast majority of states that consider water rights as nonpossessory use rights, a small minority of states still follows the ancient "absolute dominion rule" (also known as "absolute ownership," the "English rule," or the "rule of capture").[248] That rule draws on the *ad coelum* doctrine.[249] As first articulated in *Acton v. Blundell* in 1843, the

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243 GETCHES, *supra* note 41, at 273–74 ("Private property notions do not inhibit state control of groundwater in most jurisdictions.").

244 As Professor Dellapenna explains, "Under the *correlative rights rule,* landowners hold proportionate proprietary shares in the aquifer, with the largest landowner having the largest share of the aquifer because that landowner has the largest share of the land above the aquifer. Under the *reasonable use rule*, the groundwater may be used reasonably and only on the land from beneath which it had been withdrawn, thus limiting the property rights in the aquifer of the overlying owners." Dellapenna, *Quantitative Groundwater Law*, *supra* note 240, at § 19.03 (emphasis added).

245 Correlative rights are generally regarded as usufructuary rights. Dellapenna, *Primer*, *supra* note 241, at 284 ("The right of the overlying owner to use groundwater is a usufructuary right and not an absolute right."). *See also In re* Water Use Permit Applications, 9 P.3d 409, 493 (Haw. 2000) (suggesting that the correlative rights rule "does not describe an unqualified right of *ownership*, but a limited, situational right of *use* contingent at all times on numerous variables"). Likewise, the reasonable use rule for groundwater resembles the surface rule of the same name, which recognizes only a usufructuary right to apply water to reasonable purposes. Dellapenna, *Primer*, *supra* note 241, at 295 (noting some persistent treatment of the rule in its abstract or absolute form).

246 Dellapenna, *Primer*, *supra* note 241, at 297–302.

247 *See* Joseph W. Dellapenna, *Water Law in the Eastern United States: No Longer a Hypothetical Issue*, 26 ENERGY & MIN. L. INST. § 11.05 (2005) (describing the application of appropriative rights to groundwater as a "private property" system that is "directly parallel" to the surface prior appropriation doctrine, and noting that "courts conclude that they or the legislature can change the [appropriative] legal regime for groundwater in their state without the change being a taking of private property"). *See also* Chatfield E. Well Co. v. Chatfield E. Prop. Owners Ass'n, 956 P.2d 1260, 1267–69 (Colo. 1998) (rejecting well company's claim that it was the sole owner of all groundwater beneath its property not tributary to surface streams and declaring, "[r]egardless of whether water rights are obtained in accordance with prior appropriation law or pursuant to the [state's statutory groundwater permit system], no person 'owns' Colorado's public water resources as a result of land ownership").

248 Dellapenna, *Primer*, *supra* note 241, at 269–70. This rule, with slight variation in meaning, is also called the "absolute ownership rule," the "English rule," or the "rule of capture." *Id.*; GETCHES, *supra* note 41, at 268–69.

249 The *ad coelum* doctrine was discussed in *supra* Part IV.A. *See also* GETCHES, *supra* note 41, at 268 (suggesting that the *Acton* court "viewed groundwater as part of the soil and based its holding upon the ancient right of a landowner to the airspace above and the soil beneath the land").

principle "gives to the owner of the soil all that lies beneath his surface; that the land immediately below is his property, whether it is solid rock, or porous ground, or venous earth, or part soil, part water."[250] As a consequence, landowners may pump as much groundwater from beneath their property as they wish, subject to a like right in their neighbors.[251] In contrast to any other surface water or groundwater doctrine, the absolute dominion rule establishes a possessory property right.[252] In some cases, the property right may not arise until groundwater has been pumped from the Earth and "captured."[253] Today, the rule is followed most forcefully in Texas (which recognizes ownership even prior to capture), but it is also followed in Indiana and Maine.[254]

2. The Implications

Beyond the resolution of conflicts between individual water users, the jurisdiction's choice of doctrine has several broader impacts. Most importantly, it determines the extent to which government regulation of water rights gives rise to compensable regulatory takings under the Fifth Amendment to the United States Constitution and parallel state constitutional provisions. The vulnerability to takings challenges can either encourage or chill regulatory efforts to promote the sustainable use of water. Such regulations might include, for example, special rules for declining groundwater supplies, or making a systemic transition from common law water rights to modern statutory systems, including conjunctive management regimes that integrate surface water and groundwater into a single unified system.[255]

The state of Texas provides a useful example. In 1904, the Texas Supreme Court adopted the rule of capture for groundwater within the state, citing *Acton v. Blundell*.[256] As later clarified by the Texas Supreme Court, the capture rule means, "that a landowner is the absolute owner of groundwater flowing *at the surface* from its well, even if the water

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250 Acton v. Blundell, 152 Eng. Rep. 1223, 1235 (Ex. Cham. 1843).

251 *Id.* ("the person who owns the surface may dig therein, and apply all that there is there found to his own purposes at his free will and pleasure; and that if, in the exercise of such right, he intercepts or drains off the water collected . . . in his neighbour's well, this inconvenience . . . falls within the description of damnum absque injuria, which cannot become the ground of an action").

252 Dellapenna, *Primer*, *supra* note 241, at 272–73.

253 *Id.*

254 *Id.* at 274–75 (concluding that the rule "perhaps survives to any real degree only in Indiana, Maine, and Texas").

255 *See generally* Dave Owen, *Taking Groundwater*, *supra* note 231, at 270–71; Dellapenna, *Primer*, *supra* note 241, at 274–76.

256 Edwards Aquifer Authority v. Day, 369 S.W.3d 814, 823–25 (Tex. 2012) (discussing Houston & T.C. Railway v. East, 81 S.W. 279 (Tex. 1904)).

originated beneath the land of another."[257] That right is not "unfettered," the Court explained, and it does not preclude legislative regulation which the Court "recognized and encouraged."[258] In 1993, Texas adopted legislation creating the Edwards Aquifer Authority, and prohibited groundwater withdrawal from the Edwards Aquifer without a permit.[259] But when the Authority denied landowner Burrell Day a permit, he sued, claiming among other things that the denial was an unconstitutional taking of his groundwater in violation of the Texas Constitution.[260] The Texas Supreme Court agreed in theory, holding in *Edwards Aquifer Authority v. Day* that "land ownership includes an interest in groundwater *in place* that cannot be taken for public use without adequate compensation guaranteed by [the Texas Constitution]."[261] Analogizing to oil and gas law, the Court recognized a qualification:

> In our state the landowner is regarded as having absolute title in severalty to the oil and gas in place beneath his land. The only qualification of that rule of ownership is that it must be considered in connection with the law of capture and is subject to police regulations. The oil and gas beneath the soil are considered a part of the realty. Each owner of land owns separately, distinctly and exclusively all the oil and gas under his land and is accorded the usual remedies against trespassers who appropriate the minerals or destroy their market value.[262]

The Court affirmed the denial of summary judgment against Day's taking claim and remanded for a determination of whether a taking had actually occurred.[263]

Thus, beyond "owning" groundwater extracted from beneath their property and captured at the surface, Texas landowners hold some sort of property right to the *in situ* groundwater accumulated below their land. *Edwards Aquifer Authority v. Day* has given rise to significant scholarly commentary on Texas' uniquely strong assertion of property rights in groundwater and its future implications for regulatory takings and other legal doctrines.[264]

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257 *Id.* at 826 (emphasis added).

258 *Id.* at 828.

259 *Id.* at 818–19.

260 *Id.* at 820–21.

261 *Id.* at. 817–18.

262 *Id.* at 831–32 (quoting Elliff v. Texon Drilling Co., 210 S.W.2d 558, 561 (Tex. 1948)).

263 *Id.* at 843.

264 *See, e.g.*, Marvin W. Jones & C. Brantley Jones, *The Evolving Legacy of* EAA v. Day*: Toward an Effective State Water Plan*, 68 BAYLOR L. REV. 765 (2016); Dave Owen, *Taking Groundwater*, 91 WASH. U. L. REV. 253, 280–82 (2013) (concluding, "the American groundwater/takings cases provide little support for arguments against treating water rights as constitutional property . . . protected by the takings doctrine" but finding little evidence that "past

V. CONCLUSION

Aquifer depletion poses a serious worldwide problem, with groundwater pumping levels exceeding natural rates of recharge in many areas. Of the globe's thirty-seven largest aquifers, twenty-one are declining.[265] In some dry areas of the world including Pakistan and North Africa, water shortages could easily threaten global stability. Meanwhile in the southeastern United States, the sprawling Memphis-Sparta Aquifer underlies some 70,000 square miles of Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee.[266] And yet, no interstate agreement or management plan governs the use of this shared resource.[267]

Two of those states, Mississippi and Tennessee, are now before the U.S. Supreme Court in an effort to reconcile their competing demands on the Aquifer. The Court has a well-developed jurisprudence—equitable apportionment—to resolve surface water disputes among the states. But the Court has no clear mechanism to directly address interstate groundwater fights (although the apportionment doctrine has proved flexible enough to allocate some interrelated groundwater in cases dividing up the use of surface rivers).[268] To fill that doctrinal void, Mississippi has offered up a dusty old theory of groundwater ownership that hearkens back to the discredited *ad coelum* doctrine[269] and to the historic view that groundwater is too mysterious to allow for its regulation.[270]

Mississippi's theory would upset long-settled precedent. It purports to sweep away the Court's traditional threshold for hearing lawsuits among

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courts' treatment of groundwater use rights as constitutional property led to doctrinal restrictions on groundwater regulation" apart from Texas); Dellapenna, *Primer*, *supra* note 241, at 274–75 ("The Texas legislature has attempted to curtail the absolute rights of landowners, but its efforts have been limited by strong resistance in the state's courts"); Christina Hoffman & Sandra Zellmer, *Assessing Institutional Ability to Support Adaptive, Integrated Water Resources Management*, 91 NEB. L. REV. 805 (2013); Peter M. Gerhart & Robert D. Cheren, *Recognizing the Shared Ownership of Subsurface Resource Pools*, 63 CASE W. RES. L. REV. 1041 (2013); Marvin W. Jones & Andrew Little, *The Ownership of Groundwater in Texas: A Contrived Battle for State Control of Groundwater*, 31, BAYLOR L. REV. 578 (2010).

265 Boyce Upholt, *An Interstate Battle for Groundwater: Mississippi and Tennessee are Locked in a Dispute Over Who Can Use the Delta's Aquifers*, THE ATLANTIC, Dec. 4, 2015, at 3, https://www.theatlantic.com/science/archive/2015/12/mississippi-memphis-tennesee-groundwater-aquifer/418809/.

266 United States' Amicus Brief, *Mississippi v. Tennessee*, *supra* note 121, at 2.

267 Brett Walton, *Mississippi's Claim That Tennessee Is Stealing Groundwater Is a Supreme Court First*, CIRCLE OF BLUE, Oct. 3, 2016, http://www.circleofblue.org/2016/groundwater/states-lag-management-interstate-groundwater/.

268 *See supra* note 111.

269 *See infra* Part IV.A.

270 *See supra* notes 63–64 and accompanying text.

the states—proof of interstate harm.[271] Instead, Mississippi would substitute an arcane test based on the flow of groundwater at the time of statehood, even in cases where the aquifer containing the water is admittedly an interstate formation into which numerous states can drill wells.[272] Additionally, Mississippi claims hundreds of millions of dollars in damages, a remedy that displaces traditional injunctive relief. Most importantly, Mississippi seeks a declaration that it "owns" the groundwater beneath its territory—a claim that turns on its head water law's recognition of "usufructuary" rights only.

It may very well be that Tennessee is pumping too much water from a shared resource, and that Mississippi is entitled to some relief. But during the first decade of litigation between Mississippi and Tennessee, the courts have generally rejected Mississippi's ownership theory, and have indicated that the doctrine of equitable apportionment might be appropriate for the resolution of interstate disputes over both groundwater and surface water.[273] The language of ownership, however, is seductive, and it has crept into many court rulings and pleadings.[274] As the litigation moves forward, the Special Master and the U.S. Supreme Court should take care to frame the dispute as one implicating water *use,* not *ownership*. In so doing, they could pressure the parties to come to a negotiated settlement of their differences. Barring that, the Court could apply the equitable apportionment doctrine to determine the limits of each state's use of the shared underground aquifer.

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271 *See supra* note 125 and accompanying text.

272 *See supra* notes 135–37 and accompanying text.

273 *See supra* Parts II.C and II.D.

274 *See infra* Part II.D.5.