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The Law of Water Allocation in the Southeastern States at the Opening of the Twenty-First Century

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THE LAW OF WATER ALLOCATION IN THE SOUTHEASTERN STATES AT THE OPENING OF THE TWENTY-FIRST CENTURY

Joseph W. Dellapenna[*]

I. INTRODUCTION

The vastly differing experiences of communities in the United States regarding water has led to very different approaches to property rights in water.[1] To the east of Kansas City, people considered water to be readily available at little or no cost. Although occasionally there were problems with water quality arising from human activities, shortages historically have been rare and short-lived. There evolved in this setting a body of law known as riparian rights, predicated on treating the resource as a species of common property.[2] To the west of Kansas City, people considered water to be scarce, or at least misplaced.[3] Therefore, the right to use water in the West was treated as a species of private property under a body of law now known as appropriative rights.[4]

Under a common property system like riparian rights, all co-owners of the property are left pretty much to their own individual judgment to decide whether, when, and how to use the resource.[5] Each owner receives the full benefit of any added use, while the cost of this benefit is spread over all owners. Garrett Hardin explained thirty-four years ago, however, that when a common property system approaches the carrying capacity of the resource, a "tragedy of the commons" ensues.[6] Acting purely rationally, each co-owner continues to place ever greater demands on the resource even as it is exhausted, if only because other co-owners are doing likewise. Adding

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1. *See generally* Joseph W. Dellapenna, *Dual Systems*, *in* 1 WATERS AND WATER RIGHTS ch. 8 (Robert E. Beck ed., LEXIS Repl. 2001); Bernhard Grossfeld, *Geography and Law*, 82 MICH. L. REV. 1510 (1984).

2. *See generally* Joseph W. Dellapenna, *Introduction to Riparian Rights*, *in* 1 WATERS AND WATER RIGHTS, *supra* note 1, § 6.01(b)(1) [hereinafter Dellapenna, *Introduction*]; Joseph W. Dellapenna, *The Right To Consume Water Under "Pure" Riparian Rights*, *in* 1 WATERS AND WATER RIGHTS, *supra* note 1, ch. 7 [hereinafter Dellapenna, *"Pure" Riparian Rights*].

3. For the classic statement of this notion, see *United States v. Gerlach Livestock Co.*, 339 U.S. 725 (1950).

4. *See generally* Owen Anderson et. al, *Prior Appropriation*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 1, chs. 11–17.

5. Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, §§ 7.02–.03(e).

6. Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243 (1968).

demand is the only way to appropriate a share of a resource being grabbed by all. A current example is the exhaustion of fisheries in the high seas.[7] Among many other examples, one could include national park access and even the federal treasury.[8]

In the eastern states, demand for water continues to increase and precipitation patterns seem to have become more erratic, causing recurring water shortages to become more frequent.[9] There simply no longer is enough water to satisfy all needs in eastern states. The predictable result is a considerable increase in the number of disputes over water. The new increase in water shortages has forced many eastern states to reconsider their law for allocating water among competing users. Many of the eastern states have abandoned or modified the system of riparian rights that evolved in the nineteenth century on the assumption of permanent surpluses. These states have not, however, simply imported appropriative rights to solve these problems. Rather, eastern states have developed a new system of law based on treating the water as a species of public property rather than as either common or private property, a system that is coming to be called "regulated riparianism."[10] Not all eastern states have adopted this system, however, and thus there are now three distinct systems of water law in use in the United States, each of which requires discussion in order to understand the present law in eastern states and what is likely to come in the future as more and more states revise their water law in fundamental ways.

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7. *See* FRANCIS T. CHRISTY, JR. & ANTHONY SCOTT, THE COMMON WEALTH IN OCEAN FISHERIES (1965); Luz Eugenia Cereceda & Guillermo Wormald, *Privatization of the Sea for Seaweed Production in Chile*, 27 NATURE & RESOURCES 31 (1991); Manjira Datta & Leonard J. Mirman, *Externalities, Market Power, and Resource Extraction*, 37 J. ENVTL. ECON. & MGT. 233 (1999); Ronald D. Fischer & Leonard J. Mirman, *The Compleat Fish Wars: Biological and Dynamic Interactions*, 30 J. ENVTL. ECON. & MGMT. 34 (1996); J.R. Gould, *Extinction of a Fishery by Commercial Exploitation: A Note*, 90 J. POL. ECON. 1031 (1972); Patrick A. Nickler, *A Tragedy of the Commons in Coastal Fisheries: Contending Prescriptions for Conservation, and the Case of the Atlantic Bluefin Tuna*, 26 B.C. ENVTL. AFF. L. REV. 549 (1999); Katharine Marvin, Note, *Protecting Common Property Resources Through the Marketplace: Individual Transferable Quotas for Surf Clams and Ocean Quahogs*, 16 VT. L. REV. 1127 (1992); Carrie A. Tipton, Note, *Protecting Tomorrow's Harvest: Developing a National System of Individual Transferable Quotas To Conserve Ocean Resources*, 14 VA. ENVTL. L.J. 381 (1995).

8. *See, e.g.*, JOSEPH L. SAX, MOUNTAINS WITHOUT HANDRAILS (1980) (national parks); Rodney D. Fort & John Baden, *The Federal Treasury as a Common Pool Resource and the Development of a Federal Bureaucracy*, *in* BUREAUCRACY VERSUS ENVIRONMENT 9 (John Baden & Richard L. Stroup eds., 1981) (federal treasury).

9. *See generally* WILLIAM ASHWORTH, NOR ANY DROP TO DRINK (1982); Robert Abrams, *Charting the Course of Riparianism: An Instrumentalist Theory of Change*, 35 WAYNE L. REV. 1381, 1405–46 (1989); Patrick Corbett, Note, *The Overlooked Farm Crisis: Our Rapidly Depleting Water Supply*, 61 NOTRE DAME L. REV. 454 (1986).

10. *See generally* Joseph W. Dellapenna, *Regulated Riparianism*, *in* 1 WATERS AND WATER RIGHTS, *supra* note 1, ch. 9.

In this article, I discuss the evolving law of water allocation in the southeastern states of the United States. These states include Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, and South Carolina. I begin by describing, in Parts II, III, and IV, the three approaches to water allocation law already introduced. In Part V, I summarize the comparable developments regarding groundwater. Finally, in Part VI, I briefly describe the law of each state as of this writing. I then conclude with a brief comment on the pattern of evolution in these rights and some suggestions on what the future might hold.

II. RIPARIAN RIGHTS

Today, no state relies solely on "pure" riparian rights. All states have at least a few regulatory statutes that deal with limited aspects of water quantity issues.[11] In nearly half of the eastern states, however, the common law of riparian rights continues to be the basic law applicable to disputes over the allocation of water between individual users who withdraw water directly from a natural source. In these states, regulation serves to protect the public interest in water yet plays little part in the resolution of quantity disputes between such direct water users.

Riparian rights are based on the premise that the right to use water is a natural attribute of land, dependent on the natural availability of water to the land.[12] Indeed, the very word "riparian" derives from the Latin word "*ripa*" meaning a riverbank.[13] Land abutting or underlying a watercourse is thus termed "riparian land."[14] Some early cases seem to support the theory that an owner of riparian land is entitled to have the natural flow of a watercourse come down to the land without change in quantity or quality.[15] Under the modern understanding of riparian rights, each owner of riparian land is entitled to use water from a contiguous watercourse regardless of the ef-

11. *Id.* § 9.02.

12. *See* Tyler v. Wilkinson, 24 Fed. Cas. 472, 474 (C.C.D.R.I. 1827) (No. 14,312) ("The natural stream, existing by the bounty of Providence for the benefit of the land through which it flows, is an incident annexed, by operation of law, to the land itself."). Justice Story's opinion in that case is often cited as the first true riparian rights case. *See also* Hendricks v. Johnson, 6 Port. 472 (Ala. 1837); Buddington v. Bradley, 10 Conn. 213 (1834); Blanchard v. Baker, 8 Me. 253 (1832); City of Baltimore v. Appold, 42 Md. 442 (1875); Johnson v. Jordan, 43 Mass. (2 Met.) 234 (1841); Corning v. Troy Iron Factory, 40 N.Y. 191 (1869); JOHN M. GOULD, THE LAW OF WATERS § 148 (3d ed. 1900). For a modern expression of the view that riparian rights are a natural attribute of the land abutting a watercourse, see *Niagara Mohawk Power Corp. v. Cutler*, 492 N.Y.S.2d 137 (N.Y. App. Div. 1985), *aff'd mem.*, 492 N.E.2d 398 (N.Y. 1986).

13. Johnson v. McCowen, 348 So. 2d 357, 360 n.3 (Fla. Dist. Ct. App. 1977).

14. For an analysis of what constitutes riparian land, see Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.02.

15. *Id.* § 7.02(c).

fect on the natural flow of the watercourse so long as each user does not transgress the equal right of other riparians to use the water.[16] While domestic uses are preferred over other uses, the only real restriction is that no use is legal if it "unreasonably harms" another riparian use.[17]

A. The Reasonable Use Rule

The case of *Harris v. Brooks*[18] illustrates the modern application of riparian rights. The plaintiffs in *Harris* conducted a commercial boat rental service on land leased on the shore of a small lake; members of the general public came for fishing and recreational boating.[19] Brooks grew rice on his land on the shore of the same lake. Brooks began to pump large quantities of water from the lake for his rice fields during a drought, lowering the lake level.[20] At about the same time, the public stopped renting boats, and the fish stopped biting.

Brooks's pumping would clearly have violated the natural flow theory. Yet to enjoin his pumping under that theory would have required the court to prohibit virtually all pumping for any purpose whatsoever. Instead, Justice Paul Ward turned to the reasonable use theory, stressing that the court's goal was to assure the equal rights of each riparian "as near as may be."[21] Equality of right needs explanation in a case like *Harris* because the rights of different riparians in dissimilar situations simply cannot be identical. One riparian, who makes a particular use that harms no one, is privileged to do so, while another riparian, making an identical use but with different effects, might very well be enjoined or have to pay damages. On the other hand, two riparians making dissimilar uses of water might be found entitled to equal—or vastly different—amounts of water.

What reasonable use theory assures to each riparian is an equal right to share in the legal process of allocating water to maximize, in so far as possible, the beneficial use of each while minimizing the harm to the others.[22] No riparian is free to disregard the needs of others, nor should any riparian

16. Both points trace back to Justice Story's opinion in *Tyler v. Wilkinson*, 24 Fed. Cas. at 474. That opinion includes several references to the "perfect equality" of the rights of each riparian while mentioning both a right to the natural flow and a right to make a reasonable use. The two elements also appear in the even older case of *Merrit v. Parker*, 1 N.J.L. 460, 464–66 (1795).

17. *See* Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, §§ 7.02(b)(1), 7.03.

18. 225 Ark. 436, 283 S.W.2d 129 (1955).

19. *Id.* at 438, 283 S.W.2d at 130–31.

20. *Id.*, 283 S.W.2d at 131.

21. *Id.* at 443, 283 S.W.2d at 133.

22. *See generally* RESTATEMENT (SECOND) OF TORTS § 850 cmt. d (1977) [hereinafter RESTATEMENT]; Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, §§ 7.03(a), 7.03(b)(2), 7.03(c)(2).

suffer having her own needs disregarded. Justice Ward sought to simplify his task by positing four simple rules to capture this limited concept of equality of right:

> (a) The right to use water for strictly domestic purposes—such as for household use—is superior to any other uses of water—such as for fishing, recreation, and irrigation.
> (b) Other than the use mentioned above, all other lawful uses of water are equal. Some of the lawful uses of water recognized by this state are: fishing, swimming, recreation, and irrigation.
> (c) When one lawful use of water is destroyed by another lawful use the latter must yield, or it may be enjoined.
> (d) When one lawful use of water interferes with or detracts from another lawful use, then a question arises as to whether, under all the facts and circumstances of that particular case, the interfering use shall be declared unreasonable and as such enjoined, or whether a reasonable and equitable adjustment should be made, having due regard to the reasonable rights of each.[23]

As both uses were lawful, that is, reasonable as a matter of abstract analysis, and neither use was domestic, the first two rules provided no help in resolving the dispute. If one closely considers the third rule, enjoining the use that destroys the other, one finds that rule, like the second rule, to be virtually meaningless. As economist Ronald Coase was to point out about six years later, in a case like this each use necessarily interferes with the other, and whichever prevails necessarily destroys the other.[24] Justice Ward seemed to realize this—he never adverted to the third rule in his decision of the case. Instead, he adopted the language of the first *Restatement of Torts*:

> The determination in a particular case of the unreasonableness of a particular use is not and should not be an unreasoned, intuitive conclusion on the part of the court or jury. It is rather an evaluating of the conflicting interests of each of the contestants before the court in accordance with the standards of society, and a weighing of those, one against the other . . . . [I]t is only when one riparian proprietor's use of the water is

23. *Harris*, 225 Ark. at 444, 283 S.W.2d at 134.

24. Ronald Coase, *The Problem of Social Cost*, 3 J. LAW & ECON. 1, 3–15 (1960). William Rodgers has sought to make light of this insight by using as a model a chicken farmer competing with a neighboring fox rancher. *See* 1 WILLIAM RODGERS, JR., ENVIRONMENTAL LAW: AIR AND WATER § 1.1B, at 6 (1986) ("Causation-neutrality that attributes the spillover damage in equal parts to the hunger of foxes and the tastiness of chickens is a hard sell among people who can tell the difference between aggressor and victim."). In a contest between a rice farmer and the operator of a boat livery, there is little, if any, of the intuitive sense of who is in the right that is so appealing in the fox/chicken example; and if one philosophically favors the "natural outcome," does this make one unsympathetic to the fox? *See generally* Dellapenna, *Introduction*, *supra* note 2, § 6.01(b)(1) nn.341–46.

> unreasonable that another who is harmed by it can complain, even though the harm is intentional. Substantial intentional harm to another cannot be justified as reasonable unless the legal merit or utility of the activity which produces it outweighs the legal seriousness or gravity of the harm.[25]

What Justice Ward posited was a relational test, a weighing of the social value of the two uses against each other to determine which use is more valuable to society.[26] In *Harris*, as in many other cases, however, the court provided no more than a vague discussion of how to balance the uses against each other. Such a balancing requires a court to undertake a polycentric process that, at the very least, strains the capacity of courts to act in the traditional mode of disinterested umpire rather than actively involved manager.[27] In the end, the court ordered Brooks's pumping to be enjoined whenever the water fell below 189.67 feet above sea level. Although Justice Ward acknowledged that this was the "normal level" of the lake, he was careful to insist that the court chose 189.67 feet not because the chosen level was normal, but because it was the level at which Brooks's pumping for his rice fields unreasonably interfered with the plaintiffs' use of the lake.[28]

Justice Ward's opinion in *Harris* remained unclear about how the court determined that commercial recreational boating and fishing is a more reasonable use of Horseshoe Lake than growing rice.[29] Frank Trelease, the associate reporter of the *Restatement (Second) of Torts* ("*Restatement (Second)*"), apparently thought that the answer was because the boat livery had begun operating before the rice farming, at least in terms of the particular year.[30] As Brooks had been irrigating his rice for more than twenty years and the immediate plaintiff had only begun his boat livery in the year of the suit,[31] temporal priority hardly seems the key.[32]

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25. *Harris*, 225 Ark. at 446, 283 S.W.2d at 135 (quoting RESTATEMENT OF TORTS § 852 cmt. c (1939)).

26. *See generally* Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.02(d)(2).

27. *See* Lon Fuller, Adjudication and the Rule of Law, *in* PROC. AM. SOC'Y INT'L L. 1, 3–5 (1960). *Cf.* Lawrence M. Friedman, *Legal Rules and the Process of Social Change*, 19 STAN. L. REV. 786 (1967). *See generally* DIANA C. GIBBONS, THE ECONOMIC VALUE OF WATER (1986).

28. *Harris*, 225 Ark. at 447–48, 283 S.W.2d at 135–36.

29. For example, on very similar facts, the Arkansas Supreme Court reached the opposite conclusion when the boating and fishing were for personal, rather than for commercial, recreation. *See* Nilsson v. Latimer, 281 Ark. 325, 664 S.W.2d 447 (1984).

30. RESTATEMENT, *supra* note 22, § 850A app. at 32.

31. Brooks had begun irrigating rice in 1931, although he had not irrigated any in 1953, the year before the suit, and apparently in some other years as well; thus, Brooks used no more water in 1954 than he had in 1951 or 1952. *Harris*, 225 Ark. at 437–38, 283 S.W.2d at 130–31.

32. Dean Trelease also seemed uncomfortable with his temporal analysis. In the illustration that he based on *Harris v. Brooks*, he suggested that the court ought to have conditioned

On the other hand, if one supposes that the key to the court's holding is the economic value of the two activities, the court would have to reopen the suit whenever the product values at stake changed significantly. Such variations could occur through changes in the market values of the two products, or if Brooks were to acquire more land and therefore was able to produce more rice—but only by pumping even more water. Justice Ward was aware of this problem. He adopted a specific lake level as the point where Brooks's pumping must cease precisely in order to avoid the possibility of the frequent relitigation of reasonableness.[33] Yet it remains impossible to believe that the court would have refused to reconsider the question if a sufficient change in the relevant facts were to occur.[34]

Although some courts and many observers have assumed that the rule of reasonable use requires a simple pro rata sharing among competing users when there is not enough water to go around,[35] that is not actually true, as the *Harris* decision demonstrates—the rice farmer was ordered to stop pumping, rendering his crop a total loss. On the other hand, only minimal, if any, attention is given to such non-economic questions as the natural characteristics of the stream, general social concerns, or abstract justice.[36] The central concept of the right to use water as being a consequence of the natural features of the land means that any use on non-riparian land is per se unreasonable.[37] Who began the use of water first was simply not relevant.[38] Remember, in *Harris* itself, Brooks had been pumping water from the lake for years to irrigate his rice fields, while the plaintiffs had opened their boat livery for the first time during the very year that the litigation began.

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the injunction on the plaintiffs reimbursing Brooks for half (yes, only half) the value of his lost rice crop. RESTATEMENT, *supra* note 22, § 850A illus.9.

33. *Harris*, 225 Ark. at 448, 283 S.W.2d at 136. Such an approach is more characteristic of dual-system states in which courts characteristically think in terms of specific appropriations of water even when they are dealing with vestigial riparian rights. *See* Dellapenna, *supra* note 1, § 8.03(b)(2).

34. Forty-five years later, the Arkansas Supreme Court avoided ruling on the need to maintain the "normal level" of Horseshoe Lake. Taylor v. Zanone Props., 342 Ark. 465, 30 S.W.3d 74 (2000). This might not have been the same Horseshoe Lake.

35. *See, e.g.*, Jones v. Oz-Ark-Val Poultry Co., 228 Ark. 76, 306 S.W.2d 111 (1957); White v. E. Lake Land Co., 23 S.E. 393 (Ga. 1895); Bouris v. Largent, 236 N.E.2d 15 (Ill. App. Ct. 1968); Cozy Lake, Inc., v. Nyoda Girls' Camp, Inc., 131 A. 892 (N.J. 1926). *See generally* Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.03(c)(1).

36. These principles figure prominently in the *Restatement (Second)* even if they do not figure prominently in the cases. RESTATEMENT, *supra* note 22, § 850A. *See generally* Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.02(d)(3).

37. *See* Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.02(d)(1).

38. *Id.* § 7.03(d).

B. The Weaknesses of Riparian Rights

Riparian rights suffer from certain weaknesses. These include the vagueness and unpredictability of the criteria of decision in any conflict over water, the lack of a process for managing water during extreme shortages or for protecting public values, the systematic bias in favor of large users, and the impracticality of developing markets under a legal regime that suffers from such shortcomings. Space allows only a brief mention of each of these problems.

First, consider the vagueness and unpredictability of the criteria of decision.[39] As in *Harris v. Brooks*, even long established uses can be cut off without compensation if a court decides that a recently begun use is more reasonable. Just as serious is the reality that courts cannot deliver a decision, even as between the litigants themselves, which will be good for more than the day on which it is given. If either of the competing uses changes in physical or economic terms, the calculus of reasonableness will change, and what was hitherto considered a reasonable use may suddenly become unreasonable. Instability of result is seen by many as the major problem in reasonable use theory, having been used to explain the attempted complete shift away from riparian rights in western states, and the shift to regulated riparianism in eastern states.[40] Courts, as well as scholars, have considered this a serious impediment to private investment in water development.[41]

Another problem with riparian rights is that there is no process for managing water in times of extreme shortage or for otherwise protecting public values.[42] The slow, laborious process of individual litigation is not adapted to such purposes, yet there is no mechanism for determining and reviewing the rights of all users on a particular watercourse. Courts nor-

39. *Id.* §§ 7.02(d)(3)–.03(e).

40. *See* Coffin v. Left Hand Ditch Co., 6 Colo. 443 (1882); Drake v. Earhart, 23 P. 541 (Idaho 1890); Jones v. Adams, 6 P. 442 (Nev. 1885). *See also* FRANK E. MALONEY, RICHARD AUSNESS, & J. SCOTT MORRIS, A MODEL WATER CODE 189–91 (1972); FRANK MALONEY ET AL., WATER LAW AND ADMINISTRATION: THE FLORIDA EXPERIENCE § 60 (1968); Richard Ausness, *Water Rights, the Public Trust Doctrine and the Protection of Instream Uses*, 1986 U. ILL. L. REV. 407, 416–18; William H. Farnham, *The Improvement and Modernization of New York Water Law Within the Framework of the Riparian System*, 3 LAND & WATER L. REV. 378 (1968); M. Mason Gaffney, *Economic Aspects of Water Resources Policy*, 28 AM. J. ECON. & SOCIOLOGY 131, 137–38 (1969); Richard S. Harnsberger, *Prescriptive Water Rights in Wisconsin*, 1961 WIS. L. REV. 47, 60; T.E. Lauer, *Reflections on Riparianism*, 35 MO. L. REV. 1, 13–15 (1970); Ronald B. Robie & Patricia R. Donovan, *Water Management of the Future: A Ground Water Storage Program for the California State Water Project*, 11 PAC. L.J. 41 (1979). *See generally* Dellapenna, *Introduction*, *supra* note 2, § 6.01(b); Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.01; Dellapenna, *supra* note 10, § 9.01.

41. *See, e.g.*, Carol Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711 (1986).

42. *See* Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.05(a).

mally consider only the interests of the parties to the actual litigation and seem ill-equipped to address unrepresented interests of riparians not participating in the suit, let alone the interest of the public generally.[43]

Third, the lack of efficient, system-wide management creates a systematic bias in favor of large users.[44] Small users often will be less able to afford to litigate or to organize collectively for litigation if the water they need is taken by another, more affluent riparian. Furthermore, the balancing process generally strongly favors large users over smaller users. The economic value of the water to the large user usually will outweigh the economic loss of the small user. While smaller users can effectively aggregate their claims by receiving their water through a public system, the effectiveness of this approach is limited by legal doctrines limiting the "riparianness" of public systems.[45] Moreover, aggregation is brought about only through submission to yet a different sort of large-scale enterprise.

Finally, persons seeking to acquire the right to use water sometimes "buy" riparian rights without buying riparian land, in an attempt to create a "non-appurtenant" riparian right.[46] What a buyer obtains in such a transaction remains far from clear. The conveyance binds the seller not to contest any subsequent use by the buyer so long as it is within the terms of the sale. Some courts have concluded that the buyer obtains no rights whatsoever against riparians other than the seller. In such cases, a non-appurtenant riparian right amounts to a contract between the seller and the buyer that prevents the seller from contesting the buyer's right to use water from the common source.[47] In a few cases, the court held that a buyer of a non-appurtenant riparian right acquired the right to make a reasonable use along with all the other riparian landowners.[48] Yet, it is not clear whether the right

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43. Lynda L. Butler, *Defining a Water Ethic Through Comprehensive Reform: A Suggested Framework for Analysis*, 1986 U. ILL. L. REV. 439, 451–54; Ezra M. Holczer, Boomer *Revisited: Using Experimental and Partial Injunctions in Private Nuisance Actions*, 64 DEF. COUNS. J. 99 (1997); George D. Marlow, *From Black Robes to White Lab Coats: The Ethical Implications of a Judge's Sua Sponte, Ex Parte Acquisition of Social and Other Scientific Evidence During the Decision-Making Process*, 72 ST. JOHN'S L. REV. 291 (1998).

44. Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.02(d)(3).

45. *See* Stein v. Burden, 24 Ala. 130 (1854); Wallace v. City of Winfield, 149 P. 693 (Kan. 1915); City of Emporia v. Soden, 25 Kan. 588 (1881); Fagen v. Mayor of Wharton, 113 A. 920 (N.J. 1920); Sparks Mfg. Co. v. Town of Newton, 41 A. 385 (N.J. 1898); Smith v. City of Brooklyn, 54 N.E. 787 (N.Y. 1899); Pernell v. City of Henderson, 16 S.E.2d 449 (N.C. 1941); Town of Purcellville v. Potts, 19 S.E.2d 700 (Va. 1942). *See generally* Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.05(c).

46. *See* Dellapenna, *"Pure" Riparian Rights*, *supra* note 2, § 7.04(a)(3).

47. Borough of Media v. Edgmont Golf Club, Inc., 288 A.2d 803 (Pa. 1972).

48. Mianus Realty Co. v. Greenway, 193 A.2d 713 (Conn. 1963); Belvedere Dev. Corp. v. Dep't of Transp., 476 So. 2d 649 (Fla. 1985); Pyle v. Gilbert, 265 S.E.2d 584 (Ga. 1980); Mid-America Terminal of Ky., Inc. v. Owensboro River Sand & Gravel Co., 532 S.W.2d 437 (Ky. 1976); Williams v. Skyline Dev. Corp., 288 A.2d 333 (Md. 1972); Sundell v. Town of

of use conveyed in these few cases is to be measured by the reasonable needs of the seller, therefore avoiding possible prejudice to the other riparians, or of the buyer, thus treating the buyer as a full, equal riparian. Given these uncertainties, the buyer of a non-appurtenant riparian right has obtained little more than a hunting license that might or might not yield water. These uncertainties explain the continuing dearth of non-appurtenant sales.

III. APPROPRIATIVE RIGHTS

The eastern United States is humid, sufficiently so that early European settlers seldom faced water shortages. Generally the land becomes drier as one proceeds west, with truly arid regions between the Rocky Mountains and the coastal ranges, before reaching another, narrower humid region along the Pacific Coast.[49] European settlers in the West needed water for mining, irrigation, and later industrial and municipal uses. Westerners concluded that these demands could not be satisfied under riparian rights, particularly in its natural flow version, but also in its reasonable use incarnation.[50] Furthermore, from the earliest years of "Anglo" settlement, the newcomers generally displaced aboriginal and Spanish-Mexican law.[51] Aborigi-

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New London, 409 A.2d 1315 (N.H. 1979); Donaghey v. Croteau, 401 A.2d 1081 (N.H. 1979); *Borough of Media*, 288 A.2d at 803; Thomas v. Clark, 346 A.2d 189 (Vt. 1975); Commonwealth v. Forbes, 197 S.E.2d 195 (Va. 1973).

49. *See generally* Dellapenna, *supra* note 1, § 8.01; Grossfeld, *supra* note 1.

50. For a critique of the assumptions courts made on these issues, see Eric T. Freyfogle, *Water Justice*, 1986 ILL. L. REV. 481. *See also* MORTON HORWITZ, THE TRANSFORMATION OF AMERICAN LAW, 1780–1860, at 33–53 (1977); LUDWIK A. TECLAFF, THE RIVER BASIN IN HISTORY AND LAW (1967); LUDWIK A. TECLAFF, WATER LAW IN HISTORICAL PERSPECTIVE (1985); DONALD WORSTER, RIVERS OF EMPIRE: WATER, ARIDITY, AND THE GROWTH OF THE AMERICAN WEST (1985); Gordon Morris Bakken, *The Influence of the West on the Development of Law*, 24 J.W. 67 (1985); John Clayberg, *The Genesis and Development of the Law of Waters in the Far West*, 1 MICH. L. REV. 91 (1902); Robert Dunbar, *The Adaptability of Water Law to the Aridity of the West*, 24 J.W. 57 (1985); Lucien Shaw, *The Development of the Law of Waters in the West*, 10 CAL. L. REV. 443 (1922). Complicating such concerns was the tendency of Westerners to assume that eastern water law was a relatively static, unchanging system. *See, e.g.*, WALTER PRESCOTT WEBB, THE GREAT PLAINS 432 (1931); Gordon R. Miller, *Shaping California Water Law, 1781 to 1828*, 55 S. CAL. Q. 9, 23, 34 (1973); Donald Pisani, *Enterprise and Equity: A Critique of Western Water Law in the Nineteenth Century*, 18 WESTERN HIST. Q. 15, 19 (1987); Harry Scheiber & Charles McCurdy, *Eminent Domain Law and Western Agriculture, 1849–1900*, 49 AGRIC. HIST. 113 (1975).

51. The few apparent survivals of Spanish-Mexican law seem actually to have been fictions invented by the imagination of common law judges. *See* City of Los Angeles v. City of San Fernando, 537 P.2d 1250, 1265–67, 1273–77 (Cal. 1975); City of San Diego v. Cuyamaca Water Co., 287 P. 475 (Cal. 1930); Lux v. Haggin, 10 P. 674, 715 (Cal. 1886); City of Albuquerque v. Reynolds, 379 P.2d 73 (N.M. 1962); Cartwright v. Pub. Serv. Co. of N.M., 343 P.2d 654 (N.M. 1958); N.M. Prods. Co. v. N.M. Power Co., 77 P.2d 634 (N.M. 1937); State *ex rel.* Cmty. Ditches v. Tularosa Cmty. Ditch, 143 P. 207 (N.M. 1914); State *ex rel.* Martinez v. City of Las Vegas, 880 P.2d 868 (N.M. Ct. App. 1994); *In re* Contests of the

nal law, which might have proven better adapted to local conditions, was simply ignored. Even in Hawaii, where it had some vitality, aboriginal law became at best vestigial.[52]

In this context, the westerners developed their own approach to water allocation. This approach, which came to be known as a system of prior appropriation, gave rise to a scheme of appropriative rights. Appropriative rights are basically a private property approach to water allocation in which the water right is defined as to quantity, time, place, manner of use,[53] and most importantly, according to its priority relative to other uses.[54] Legislators in eastern states must examine appropriative rights not only in terms of how they operate in western states, but more importantly, in terms of whether they could be adopted in a contemporary eastern setting. Careful analysis suggests that they could not be adopted successfully in an eastern state.

City of Laredo, 675 S.W.2d 257, 267–78 (Tex. Ct. App. 1984). *See also* Dellapenna, *supra* note 1, § 8.02(a)–(b) nn.92–108 & § 8.02(c) nn.200–22. *See generally* NORRIS HUNDLEY, JR., THE GREAT THIRST: CALIFORNIANS AND WATER, 1770S–1990S, at 1–77 (1992); DONALD J. PISANI, TO RECLAIM A DIVIDED WEST: WATER, LAW, AND PUBLIC POLICY, 1848–1902, at 38–46 (1992); DANIEL TYLER, THE MYTHICAL PUEBLO RIGHTS DOCTRINE: WATER ADMINISTRATION IN HISPANIC NEW MEXICO (1990); Hans W. Baade, *The Historical Background of Texas Water Law—A Tribute to Jack Pope*, 18 ST. MARY'S L.J. 1, 80–87 (1986); Gregory Hobbs, Jr., *Colorado Water Law: An Historical Overview*, 1 WATER L. REV. 1 (1997); Peter L. Reich, *The "Hispanic" Roots of Prior Appropriation in Arizona*, 27 ARIZ. ST. L.J. 649 (1995) [hereinafter Reich, *Hispanic Roots*]; Peter L. Reich, *Mission Revival Jurisprudence: State Courts and Hispanic Water Law Since 1850*, 69 WASH. L. REV. 869 (1994) [hereinafter Reich, *Mission Revival Jurisprudence*]; David A. Reichard, *The Politics of Village Water Disputes in Northern New Mexico, 1882–1905*, 9 W. LEGAL HIST. 9 (1996); Anthony Scott & Georgina Coustalin, *The Evolution of Water Rights*, 35 NAT. RESOURCES J. 821, 909–10 (1995); Anastasia S. Stevens, *Pueblo Water Rights in New Mexico*, 28 NAT. RESOURCES J. 535 (1988); Pierre Lévy, Note, *Which Right Is Right: The Pueblo Water Rights Doctrine Meets Prior Appropriation*, 35 NAT. RESOURCES J. 413 (1995).

52. *See* Joseph W. Dellapenna, *Related Systems of Water Rights*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 1, § 10.01; Elizabeth Ann Ho-oipo Kala'ena'auao Pa Martin et al., *Cultures in Conflict in Hawaii: The Law and Politics of Native Hawaiian Water Rights*, 18 U. HAW. L. REV. 71 (1996); Douglas W. MacDougal, *Private Hopes and Public Values in the "Reasonable Beneficial Use" of Hawaii's Water: Is Balance Possible?*, 18 U. HAW. L. REV. 1 (1996) [hereinafter MacDougal, *Private Hopes*]; Douglas W. MacDougal, *Testing the Current: The Water Code and the Regulation of Hawaii's Water Resources*, 10 HAW. L. REV. 205 (1988) [hereinafter MacDougal, *Testing the Current*].

53. *See, e.g.*, Orr v. Arapahoe Water & Sanitation Dist., 753 P.2d 1217 (Colo. 1988); Rominiecki v. McIntyre Livestock Corp., 633 P.2d 1064 (Colo. 1981); Rencken v. Young, 711 P.2d 954 (Or. 1985); Basin Elec. Power Coop. v. State Bd. of Control, 578 P.2d 557 (Wyo. 1978).

54. *See, e.g.*, TEX. WATER CODE ANN. § 11.027 (Vernon 2000); Coffin v. Left-Hand Ditch Co., 6 Colo. 443, 446 (1882); State *ex rel.* Cary v. Cochran, 292 N.W. 239 (Neb. 1940).

A. The Origins of Appropriative Rights

Appropriative rights did not emerge from a careful analysis of the legal needs of western states. Instead, a legal regime of appropriative rights grew out of the simple fact that the early miners in California and elsewhere were trespassers.[55] The sudden peopling of California occurred without any organized government in place.[56] The Yankee intruders swept away any reliance on Spanish-Mexican law or concern about aboriginal practices.[57] To a greater extent than is often appreciated, these Yankee intruders brought with them and used the only law with which they were familiar—the common law as found in the eastern United States.[58] Yet regarding the two most material factors in their lives—land and water—they were unable to use this law.

The lands in question were deemed to belong to the federal government (the public domain), while, under riparian rights, the right to use water was held by the owner of the land. Because the "forty-niners" were unwilling to wait for the establishment of a regular government and the completion of the comprehensive land surveys that would be necessary before the government would sell the land, the miners simply trespassed on the land

55. Dellapenna, *supra* note 1, § 8.01.

56. The non-aboriginal population of California jumped from around 15,000 to about 100,000 in the single year of 1849, and grew to 300,000 within five years. *See* HUNDLEY, *supra* note 51, at 64; LEONARD PITT, THE DECLINE OF THE CALIFORNIOS: A SOCIAL HISTORY OF THE SPANISH-SPEAKING CALIFORNIANS, 1846–1890, at 52 (1966); Andrew P. Morris, *Miners, Vigilantes and Cattlemen: Overcoming Free Rider Problems in the Private Provision of Law*, 33 LAND & WATER L. REV. 581, 594 (1998); Doyce B. Nunis, Jr., *Historical Introduction*, *in* FROM MEXICAN DAYS TO THE GOLD RUSH xlvii–xlviii (Doyce B. Nunis, Jr., ed. 1993); Juan F. Peres, *Demography and Distrust: An Essay on American Languages, Cultural Pluralism, and Official English*, 77 MINN. L. REV. 269, 318 (1990); Shaw, *supra* note 50, at 445–46. *See also* PISANI, *supra* note 51, at 12–14. *See generally* CLESSON SELWYNE KINNEY, THE LAW OF IRRIGATION 155 (1894); CHARLES SHINN, MINING CAMPS: A STUDY IN AMERICAN FRONTIER GOVERNMENT 132 (Rodman Wilson Paul ed., Harper Torchbooks 1965) (1885).

57. While early statutes in several states, including California, sought to preserve the Spanish-Mexican irrigation law, such rights were always subordinated to the needs of miners. *See* GORDON MORRIS BAKKEN, THE DEVELOPMENT OF LAW ON THE ROCKY MOUNTAIN FRONTIER: CIVIL LAW AND SOCIETY, 1850–1912, at 34 (1983); BETTY EAKLE DOBKINS, THE SPANISH ELEMENT IN TEXAS WATER LAW 136–39 (1959); HOWARD ROBERTS LAMAR, THE FAR SOUTHWEST, 1846–1912: A TERRITORIAL HISTORY 91 (1966); PISANI, *supra* note 51, at 38–44. *See also* Dellapenna, *supra* note 1, § 8.02(b) nn.92–108 & § 8.02(c) nn.200–22.

58. *See, e.g.*, JOHN PHILLIP REID, LAW FOR THE ELEPHANT: PROPERTY AND SOCIAL BEHAVIOR ON THE OVERLAND TRAIL (1980). *See also* PISANI, *supra* note 51, at 14; SHINN, *supra* note 56, at 11–35; Mark T. Kanazawa, *Efficiency in Western Water Law: The Development of the California Doctrine, 1850–1911*, 27 J. LEGAL STUD. 159, 162–65 (1998); Leon R. Yankwich, *Social Attitudes as Reflected in Early California Law*, 10 HASTINGS L.J. 250 (1959); Edwin W. Young, *The Adoption of the Common Law in California*, 4 AM. J. LEGAL HIST. 355 (1960).

and took what water they needed.[59] The miners quickly sought to bring order to their lives through vigilante law. The result was the creation of a national mythology based on stories that were all too true—violent disputes, blood feuds, and sudden death.

Vigilante law was based upon the most elementary notion of justice—first in time, first in right.[60] If someone were found occupying another person's mining claim, the new occupant would most likely hang if he could not provide justification for his presence. When governments were finally organized after 1850, they could do little more than ratify the customs of the miners.[61] The mining camps applied precisely the same principles to water as they did to land. Once again, organized governments had little choice but to follow along and ratify the customs of the miners.[62] After 150 years, the miner's rule has been developed with considerable elaboration into a complex and sophisticated system of water administration found, in one form or another, in every appropriation state.[63]

Successive mining rushes to other western territories brought the same miners who had begun their hunt for wealth in California. They in turn brought the customs of the California mining camps with them. In some states, these customs were blended with ill-understood principles of Spanish-Mexican law.[64] Often, when farmers settled part of a state before or simultaneously with miners, they tended to apply riparian rights. Eventually, nearly everywhere across the West appropriative rights displaced these alternative systems.[65] In the plains states and on the Pacific Coast, the alterna-

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59. Moore v. Smaw, 17 Cal. 199 (1861) (overruling Hicks v. Bell, 3 Cal. 219 (1853)).

60. *See generally* HUNDLEY, *supra* note 51, at 67–73; PISANI, *supra* note 51, at 31; Terry L. Anderson & P.J. Hill, *The Evolution of Property Rights: A Study of the American West*, 18 J.L. & ECON. 163 (1975); Kanazawa, *supra* note 58, at 165–67. Historian Donald Pisani, however, has documented the rather considerable support small miners gave to the riparian tradition in the face of the increasing concentration of water in the hands of large, capital intensive mining companies. PISANI, *supra* note 51, at 23–26, 35–38. On the appeal and functioning of the first in time rule, compare Dean Lucek, *The Rule of First Possession and the Design of the Law*, 38 J.L. & ECON. 393 (1995), with Heidi Gorovitz Robertson, *If Your Grandfather Could Pollute, so Can You: Environmental "Grandfather Clauses" and Their Role in Environmental Inequity*, 45 CATH. U. L. REV. 131 (1995).

61. Jennison v. Kirk, 98 U.S. 453, 457 (1878) ("[T]he miners . . . were emphatically the law-makers, as respects mining, upon the public lands in the State.").

62. Irwin v. Phillips, 5 Cal. 140 (1855).

63. C. Peter Goplerud III, *The Permit Process and Colorado's Exception*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 1, § 15.

64. *See generally* DOBKINS, *supra* note 57; MICHAEL C. MEYER, WATER IN THE HISPANIC SOUTHWEST: A SOCIAL AND LEGAL HISTORY (1984); Reich, *Hispanic Roots*, *supra* note 51; Reich, *Mission Revival Jurisprudence*, *supra* note 51.

65. Dellapenna, *supra* note 1, § 8.02.

tive systems remain vestigial, but usually with little actual impact on how water is managed in western states.[66]

B. Evaluating Appropriative Rights

As developed in the courts and later by legislation, the appropriative rights doctrine always remained true to its origins. In significant respects, the doctrine did not serve its communities well—not only failing to prevent wasteful and other bad practices but actually encouraging such practices under particular circumstances.[67] First of all, appropriative rights also exhibit more uncertainty than the underlying principle—first in time, first in right—suggests. The earliest priorities predate the establishment of the modern administrative machinery.[68] Despite statutes and legal proceedings to facilitate putting these claims on record, it is still true on some watercourses that the most valuable rights to use water have never been precisely quantified.[69] Prescriptive, abandoned, or forfeited rights also create gaps in the official record.[70] The following analysis briefly describes the shortcom-

66. *Id.* §§ 8.03–.04(b).

67. *See* Janet C. Neuman, *Beneficial Use, Waste, and Forfeiture: The Inefficient Search for Efficiency in Western Water Use*, 28 ENVTL. L. 919 (1998); Steven J. Shupe, *Waste in Western Water Law: A Blueprint for Change*, 61 OR. L. REV. 483 (1982).

68. The first statute creating a formal administrative system was enacted in 1890 in Wyoming; the most recently enacted was in Oklahoma in 1963. *See* Franco-Am. Charolaise, Ltd. v. Okla. Water Res. Bd., 855 P.2d 568 (Okla. 1990); Farm Inv. Co. v. Carpenter, 61 P. 258 (Wyo. 1900). *See generally* Dellapenna, *supra* note 1, § 8.02(c). Anglo settlement, with claims of appropriative rights, began as early as 1849 in California, and at later dates in other states, always well before the creation of administrative machinery.

69. *See generally* C. Peter Goplerud III, *Adjudication of Water Rights*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 1, ch. 15; Douglas L. Grant, *Registration of Constitutional Method Water Rights*, 17 IDAHO L. REV. 7 (1980).

70. For cases recognizing prescriptive rights, see *Gibbons v. Globe Development, Nevada, Inc.*, 553 P.2d 1198 (Ariz. 1976); *Sears v. Berryman*, 623 P.2d 455 (Idaho 1981); *Hammond v. Johnson*, 66 P.2d 894 (Utah 1937). For states refusing to recognize prescriptive rights, see ALASKA STAT. § 46.15.040(a) (LEXIS 2000); IDAHO CODE § 42-607 (Michie 1996); KAN. STAT. ANN. § 82a-705 (1996); NEV. REV. STAT. ANN. § 533.060 (Michie Repl. 1995 & LEXIS Supp. 2001); UTAH CODE ANN. § 73-3-1 (2001); *People v. Shirokow*, 605 P.2d 859 (Cal. 1980); *Mountain Meadow Ditch & Irrigation Co. v. Park Ditch & Reservoir Co.*, 277 P.2d 527 (Colo. 1954); *Campbell v. Wyoming Development Co.*, 102 P.2d 745 (Wyo. 1940). For cases dealing with abandonment, see *City of Denver v. Snake River Water District*, 788 P.2d 772 (Colo. 1990); *Jenkins v. State Department of Water Resources*, 647 P.2d 1256 (Idaho 1982); *Crandall v. Water Resources Department*, 626 P.2d 877 (Or. 1981); *Cundy v. Weber*, 300 N.W. 17 (S.D. 1941); *Provo River Water Users Ass'n v. Lambert*, 642 P.2d 1219 (Utah 1982); *Okanogan Wilderness League, Inc. v. Town of Twisp*, 947 P.2d 732 (Wash. 1997). For forfeiture cases, see *Jenkins*, 647 P.2d at 1256; *State v. Oliver Bros.*, 228 N.W. 864 (Neb. 1930); *Town of Eureka v. State Engineer of Nevada*, 826 P.2d 948 (Nev. 1992); *Jones v. Anderson*, 467 P.2d 995 (N.M. 1970); *In re Cancellation of the Stabio Ditch Water Right*, 417 N.W.2d 391 (S.D. 1987); *Texas Water Rights Commission v. Wright*, 464

ings of the doctrine, shortcomings that became ever more pronounced as less and less water remained unappropriated and especially with the growing recognition of the importance of nonconsumptive uses of water.[71]

The "first in time, first in right" principle fosters premature development because one seeks to capture unappropriated waters in order to enjoy their later rents.[72] To capture the waters one must invest real social capital in diverting, storing, and applying water. Capital is diverted from socially productive uses to the task of capturing submarginal resources. Excessive diversion capacity is the rule.[73] This significant investment of social capital is not, however, continued in the post-diversion treatment of water and most appropriative takings of water are characterized by inadequate investment in post-diversionary aspects of development, especially those designed to save water.[74] The introduction of conditional rights made it even easier to capture

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S.W.2d 642 (Tex. 1971); *Provo River Water Users Ass'n.*, 642 P.2d at 1219; *Sheep Mountain Cattle Co. v. Department of Ecology*, 726 P.2d 55 (Wash. App. 1986); *In re North Laramie Land Co.*, 605 P.2d 367 (Wyo. 1980). *See generally* C. Peter Goplerud III, *Protection and Termination of Water Rights*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 1, ch. 17; V. Lane Jacobson, Note, *Snake River Basin Adjudication Issue 10: Partial Forfeiture for Non-Use of a Water Right in Idaho*, 35 IDAHO L. REV. 179 (1998).

71. *See generally* Gaffney, *supra* note 40.

72. *See generally* Amy Beatie & James Fosnaught, *The City of Golden's Application for Surface Water Rights: A Kayak Course, Instream Flow, Dilution, or What?*, 2 U. DENV. WATER L. REV. 273 (1999). The notion of capturing rents has been developed in the body of political and economic theory that goes by the name of "public choice theory." *See generally* DANIEL A. FARBER & PHILIP P. FRICKEY, LAW AND PUBLIC CHOICE: A CRITICAL INTRODUCTION (1991); IAIN MCLEAN, PUBLIC CHOICE: AN INTRODUCTION (1987); DENNIS C. MUELLER, PUBLIC CHOICE II (1989); PUBLIC CHOICE AND PUBLIC LAW: READINGS AND COMMENTARY (Maxwell Stearns ed. 1997); Richard A. Epstein, *Toward a Revitalization of the Contract Clause*, 51 U. CHI. L. REV. 703, 710–17 (1984); Chulho Jung et al., *The Coase Theorem in a Rent-Seeking Society*, 15 INT'L REV. L. & ECON. 259 (1995); Jonathan R. Macey, *Promoting Public-Regarding Legislation Through Statutory Interpretation: An Interest Group Model*, 86 COLUM. L. REV. 223 (1986); William T. Mayton, *The Possibilities of Collective Choice: Arrow's Theorem, Article I, and the Delegation of Legislative Power to Administrative Agencies*, 1986 DUKE L.J. 948; Richard A. Posner, *Economics, Politics, and the Reading of Statutes and the Constitution*, 49 U. CHI. L. REV. 263 (1982); Edward L. Rubin, *Public Choice and Legal Scholarship*, 46 J. LEGAL EDUC. 490 (1996); David A. Skeel, Jr., *Public Choice and the Future of Public-Choice-Influenced Legal Scholarship*, 50 VAND. L. REV. 647 (1997); Maxwell L. Stearns, *Restoring Positive Law and Economics: Introduction to Public Choice Theme Issue*, 6 GEO. MASON L. REV. 709 (1998).

73. *See* Neuman, *supra* note 67; Shupe, *supra* note 67.

74. *See, e.g.*, Salt River Valley Users' Ass'n v. Kovacovich, 411 P.2d 201 (Ariz. Ct. App. 1966); Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 45 P.2d 972 (Cal. 1935); Krieger v. Pac. Gas & Elec. Co., 173 Cal. Rptr. 751 (Cal. Ct. App. 1981); Wilder Irrigation Dist. v. Jorgensen, 136 P.2d 461 (Idaho 1943); State *ex rel.* Cary v. Cochran, 292 N.W. 239 (Neb. 1940); Oliver v. Skinner, 226 P.2d 507 (Or. 1951); City of Corpus Christi v. City of Pleasanton, 276 S.W.2d 798 (Tex. 1955); *Provo River Water Users Ass'n.*, 642 P.2d at 1219; Carbon Canal Co. v. Cottonwood-Gooseberry Irrigation Co., 427 P.2d 396 (Utah 1967); Fuss v. Franks, 610 P.2d 17 (Wyo. 1980); Bower v. Big Horn Canal Ass'n, 307 P.2d

rents—by establishing an intent to appropriate that might not be realized for many years.[75]

In order to capture rents, appropriators use as much water as they possibly can.[76] To an appropriator, withdrawing water, a social cost, is a private gain, creating a basis for a claim to water in the future. Appropriators thus live in an environment where it is smart to overirrigate. Much of the water shortage of the arid west would disappear overnight if appropriators had to start paying an economic price for water, and the water shortage would greatly abate if appropriators simply started thinking in terms of a zero price, instead of, as now, regarding the price as negative because of the gain they realize by piling up a great history of use.[77]

Under the "first in time, first in right" doctrine, appropriators are senior and junior to one another along a scale from first to last. When water is short, juniors drop out first and lose everything before the next senior appropriator loses anything.[78] There is no pooling of risk whatsoever. The senior appropriator is protected by exaggerating the risk to junior appropriators. Two basic economizing principles are denied. One is marginal productivity.[79] A junior appropriator who loses all access to water obviously loses

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593 (Wyo. 1957). *See generally* Ernest C. Brown & Nathaniel Weinstock, *Legal Issues in Implementing Water Reuse in California*, 9 ECOLOGY L.Q. 243 (1981); Clayton K. Yeutter, *A Legal-Economic Critique of Nebraska Watercourse Law*, 44 NEB. L. REV. 11, 39–43 (1965). Western courts have begun to penalize wasteful practices. *See* Erickson v. Queen Valley Ranch Co., 99 Cal. Rptr. 446 (Cal. Ct. App. 1971); Glenn Dale Ranches, Inc. v. Shaub, 494 P.2d 1029 (Idaho 1972); Estate of Steed Through Kazan v. New Escalante Irrigation Co., 846 P.2d 1223 (Utah 1992). *See also* Krista Koehl, *Partial Forfeiture of Water Rights: Oregon Compromises Traditional Principles To Achieve Flexibility*, 28 ENVTL. L. 1137 (1998); Mark Honhart, Comment, *Carrots for Conservation: Oregon's Water Conservation Statute Offers Incentives To Invest in Efficiency*, 66 U. COLO. L. REV. 827 (1995). How effective these legal changes will prove in practice remains to be seen.

75. *See, e.g.*, Pub. Serv. Co. of Colo. v. Bd. of Water Works, 831 P.2d 470 (Colo. 1992); City of Thornton v. City of Fort Collins, 830 P.2d 915 (Colo. 1992); Colo. River Water Conserv. Dist. v. City of Denver, 642 P.2d 510 (Colo. 1982); Colo. River Water Conserv. Dist. v. City of Denver, 640 P.2d 1139 (Colo. 1982); Colo. River Water Conserv. Dist. v. Twin Lakes Reservoir & Canal Co., 506 P.2d 1226 (Colo. 1973); City of Denver v. N. Colo. Water Conserv. Dist., 276 P.2d 992 (Colo. 1954); *In re* Water Appropriation, 280 N.W.2d 75 (Neb. 1979); *In re* Application No. 5189-3, 467 N.W.2d 907 (S.D. 1991); Carbon Canal Co. v. Sanpete Water Users Ass'n, 425 P.2d 405 (Utah 1967); Green River Dev. Co. v. FMC Corp., 660 P.2d 339 (Wyo. 1983). *See generally* Jackson B. Battle, *Paper Clouds over the Waters: Shelf Filings and Hyperextended Permits in Wyoming*, 22 LAND & WATER L. REV. 673 (1987); Beatie & Fosnaught, *supra* note 72.

76. Charles W. Howe et al., *The Performance of Appropriative Water Rights Systems in the Western United States During Drought*, 22 NAT. RESOURCES J. 379 (1982).

77. Neuman, *supra* note 67.

78. For one of the most extreme examples of this pattern, see *State ex rel. Cary v. Cochran*, 292 N.W. 239 (Neb. 1940).

79. *See generally* ROBIN PAUL MALLOY, LAW AND ECONOMICS: A COMPARATIVE APPROACH TO THEORY AND PRACTICE 20–33 (1990); RICHARD A. POSNER, ECONOMIC

some marginal units of high productivity, while the senior appropriator retains marginal units of low productivity. The other is pooling of risk. One's supply is a piece of the larger common supply, but one's piece is defined in a way that greatly increases the aggregate variability of supply above its natural variability and distributes these increased risks unequally.

There never has been a market for appropriative rights to any significant extent.[80] Appropriative rights simply are not bought and sold freely, despite crying needs for water transfers in every area.[81] The recognition and

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ANALYSIS OF LAW § 1.1 (5th ed. 1998); Herbert Hovenkamp, *Marginal Utility and the Coase Theorem*, 75 CORNELL L. REV. 783, 783 (1990).

80. *See* RODNEY SMITH, TRADING WATER: AN ECONOMIC AND LEGAL FRAMEWORK FOR WATER MARKETING 28–52 (1988); Bonnie G. Colby, *Economic Impacts of Water Law—State Law and Water Market Development in the Southwest*, 28 NAT. RESOURCES J. 721 (1988); Joseph W. Dellapenna, *The Importance of Getting Names Right: The Myth of Markets for Water*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 317 (2000); Freyfogle, *supra* note 50, at 510–14; Zachary McCormick, *Institutional Barriers to Water Marketing in the West*, 30 WATER RESOURCES BULL. 953 (1994); Kevin O'Brien, *Water Marketing in California*, 19 PAC. L.J. 1165 (1988); Barton H. Thompson, Jr., *Institutional Perspectives on Water Policy and Markets*, 81 CAL. L. REV. 671, 723–39 (1993); Robert A. Young, *Why Are There So Few Transactions Among Water Users?*, 68 AM. J. AGRIC. ECON. 1143 (1986). *See generally* RICHARD WAHL, MARKETS FOR FEDERAL WATER: SUBSIDIES, PROPERTY RIGHTS, AND THE BUREAU OF RECLAMATION 197–289 (1989).

81. *See* TERRY L. ANDERSON & PAMELA SNYDER, WATER MARKETS: PRIMING THE INVISIBLE PUMP (1997); CLAY J. LANDRY, SAVING OUR STREAMS THROUGH WATER MARKETS (1998); NAT'L RES. COUNCIL, WATER TRANSFERS IN THE WEST: EFFICIENCY, EQUITY, AND THE ENVIRONMENT (1992); BONNIE COLBY SALIBA & DAVID B. BUSH, WATER MARKETS IN THEORY AND PRACTICE: MARKET TRANSFERS, WATER VALUES, AND PUBLIC POLICY 45–46 (1987); SMITH, *supra* note 80; WAHL, *supra* note 80, at 140–44; RICHARD WAHL, WATER MARKETING IN CALIFORNIA: PAST EXPERIENCE, FUTURE PROSPECTS 11–12 (Reason Found., Policy Study No. 162, 1993); THE WATER TRANSFER PROCESS AS A MANAGEMENT OPTION FOR MEETING CHANGING WATER DEMANDS (Lawrence J. MacDonnell ed., 1990); Michael C. Blumm, *Seven Myths of Northwest Water Law and Associated Stories*, 26 ENVTL. L. 141, 145–46 (1996); Colby, *supra* note 80; James N. Corbridge, Jr., *Historical Water Use and the Protection of Vested Rights: A Challenge for Colorado Water Law*, 69 U. COLO. L. REV. 503 (1998); James D. Crammond, *Leasing Water Rights for Instream Flow Uses: A Survey of Water Transfer Policy, Practices, and Problems in the Pacific Northwest*, 26 ENVTL. L. 225 (1996); Ariel Dinar & J. Letey, *Agricultural Water Marketing, Allocative Efficiency, and Drainage Reduction*, 20 J. ENVTL. ECON. & MGMT. 210 (1991); Andrew K. Dragun & Victor Gleeson, *From Water Law to Transferability in New South Wales*, 29 NAT. RESOURCES J. 645 (1989); Thomas J. Graff & David Yardas, *Reforming Western Water Policy: Markets and Regulation*, 12 NAT. RESOURCES & ENV'T 165 (1998); Brian E. Gray, *The Modern Era in California Water Law*, 45 HASTINGS L.J. 249 (1994); Ronald C. Griffin & Fred O. Boadu, *Water Marketing in Texas: Opportunities for Reform*, 32 NAT. RESOURCES J. 265 (1992); Charles Howe et al., *The Economic Impacts of Agriculture-to-Urban Water Transfers on the Area of Origin: A Case Study of the Arkansas River Valley in Colorado*, 72 AM. J. AGRIC. ECON. 1200 (1990); Morris Israel & Jay R. Lund, *Recent California Water Transfers: Implications for Water Management*, 35 NAT. RESOURCES J. 1 (1995); Ronald A. Kaiser & Laura M. Phillips, *Dividing the Waters: Water Marketing as a Conflict Resolution Strategy in the Edwards Aquifer Region*, 38 NAT. RESOURCES J. 411, 436–43 (1998); Ronald A. Kaiser, *Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis*,

protection of third-party rights precludes true market transactions.[82] Even the highly touted California Water Bank turns out, upon close examination,

Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis, 27 TEX. TECH. L. REV. 181, 185–92 (1996); Ronald A. Kaiser & Shane Binion, *Untying the Gordion Knot: Negotiated Strategies for Protecting Instream Flows in Texas*, 38 NAT. RESOURCES J. 157 (1998); Lawrence J. MacDonnell & Teresa A. Rice, *Moving Agricultural Water to the Cities: The Search for Smarter Approaches*, 2 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 27, 45–46 (1994); Steven J. Shupe et al., *Western Water Rights: The Era of Reallocation*, 29 NAT. RESOURCES J. 413 (1989); Jack Sterne, *Instream Rights and Invisible Hands: Prospects for Private Instream Water Rights in the Northwest*, 27 ENVTL. L. 203 (1997); Mark W. Tader, *Reallocating Western Water: Beneficial Use, Property, and Politics*, 1986 U. ILL. L. REV. 277; A. Dan Tarlock & Sarah B. Van de Wetering, *Growth Management and Western Water Law: From Urban Oases to Archipelagos*, 5 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 163, 168–69 (1999); Gregory A. Thomas & Tara L. Miller, *Reflections on the "Model Water Transfer Act" by the National Heritage Institute*, 4 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 91, 99–101 (1996); Thompson, *supra* note 80; Kenneth R. Weber, *Effects of Water Transfers on Rural Areas: A Response to Shupe, Weatherford, and Checchio*, 30 NAT. RESOURCES J. 13 (1990); Paul R. Williams & Stephen J. McHugh, *Water Marketing and Instream Flows: The Next Step in Protecting California's Instream Values*, 9 STAN. ENVTL. L.J. 132 (1990); Young, *supra* note 80; Jennifer L. Cordua, Comment, *The Search for New Supplies: Salvaging the Remains of Agricultural Water Conservation in California*, 31 U.C. DAVIS L. REV. 591 (1998).

82. *See, e.g.*, CAL. WATER CODE § 1702 (West 1971); COLO. REV. STAT. § 37-92-305(3) (1999); MONT. CODE ANN. § 85-2-402 (1999); NEV. REV. STAT. ANN. § 533.370(3) (Michie Repl. 1995 & LEXIS Supp. 2001); N.M. STAT. ANN. §§ 72-5-23 to -25 (Michie 1997); OR. REV. STAT. § 540.530(1) (2001); TEX. WATER CODE § 11.134(b)(3)(B) (Vernon 2000); UTAH CODE ANN. §§ 73-3-3 to -8(1)(b) (2001); WYO. STAT. ANN. § 41-3-104 (Michie 1999); Santa Fe Trail Ranches Prop. Owners Ass'n v. Simpson, 990 P.2d 46 (Colo. 1999); *In re* May, 756 P.2d 362 (Colo. 1988); Orr v. Arapahoe Water & Sanitation Dist., 753 P.2d 1217 (Colo. 1988); CF&I Steel Corp. v. Rooks, 495 P.2d 1134 (Colo. 1972); Thompson v. Harvey, 519 P.2d 963 (Mont. 1974); W.S. Ranch Co. v. Kaiser Steel Co., 439 P.2d 715 (N.M. 1968); *In re* Sleeper, 760 P.2d 787 (N.M. Ct. App. 1988); Crandall v. Water Res. Dep't, 626 P.2d 877 (Or. 1981); White v. Bd. of Land Comm'rs, 595 P.2d 76 (Wyo. 1979). *See generally* HAROLD CARTER & HENRY VAUX, JR., THIRD-PARTY EFFECTS: THE RESEARCH CHALLENGE (1994); DAVID MITCHELL, WATER MARKETING IN CALIFORNIA: RESOLVING THIRD-PARTY IMPACT ISSUES (1993); NAT'L RES. COUNCIL, *supra* note 81, at 5–6, 38–42, 73–78, 189–91, 225–28, 254–57, 263–65; SMITH, *supra* note 80, at 17–26; Bonnie G. Colby, *Transaction Costs and Efficiency in Western Water Allocation*, 72 AM. J. AGRIC. ECON. 1184 (1990); Corbridge, *supra* note 81, at 507–13; Dellapenna, *supra* note 80, at 350–56; Willis H. Ellis, *Water Transfer Problems: Law*, *in* WATER RES. 233 (Allen Kneese & Stephen C. Smith eds. 1965); Casey S. Funk & Amy M. Cavanaugh, *Basic Exchange 101*, 1 U. DENV. WATER L. REV. 206 (1998); George A. Gould, *Water Rights Transfers and Third-Party Effects*, 23 LAND & WATER L. REV. 1 (1988); John S. Harbison, *Waist Deep in the Big Muddy: Property Rights, Public Values, and Instream Waters*, 26 LAND & WATER L. REV. 535, 546–49 (1991); Charles W. Howe et al., *Transaction Costs as Determinants of Water Transfers*, 61 U. COLO. L. REV. 393 (1990); Kaiser, *supra* note 81, at 213–14, 246–47; Avery Katz, *Judicial Decisionmaking and Litigation Expenditure*, 8 INT'L REV. L. & ECON. 127 (1988); Jay R. Lund, *Transaction Risk Versus Transaction Cost in Water Transfers*, 29 WATER RESOURCES RESOURCES 3103 (1993); MacDonnell & Rice, *supra* note 81, at 29–31; Kevin M. O'Brien & Robert R. Gunning, *Water Marketing in California Revisited: The Legacy of the 1987–92 Drought*, 25 PAC. L.J. 1053, 1062–74 (1994); Young, *supra* note 80.

to have been an instance of administrative reallocation masquerading as a market.[83]

The case of *City of Denver v. Fulton Irrigating Ditch Co.*[84] provides the classic example of what happens when a buyer seeks water for a use that is fundamentally different or at a considerable remove from that of the seller. The case arose from the attempt of the City of Denver to trade its sewage water for a brewery's "clear mountain stream." Coors Beer, a popular brewer in the suburbs of Denver, heavily advertised the high quality of the water used in its brewing. Coors, however, was unable to produce enough beer to satisfy the demand for its product without a greatly enlarged supply of water. The City of Denver, consistently one of the fastest growing cities in the United States, is always on the look out for new sources of potable water for its residents and businesses. Denver offered a swap to which Coors was all too ready to agree.

Denver would take Coors's clear mountain stream to augment its municipal supplies; Coors would have the right to use unlimited quantities of Denver sewage water for its brewery.[85] The transaction failed not because of fears over possible outrage on the part of beer drinkers, but because a group of farmers downstream from Denver, organized as the Fulton Irrigating Ditch Co., obtained an injunction against this trade because it would deprive them of the water on which they were relying.[86] The outcome in the case is all the more remarkable as the City and Coors were contracting regarding "imported water"—water from outside the watershed—over which the City would have even greater rights than it would have had if it were merely claiming the rights of a senior appropriator.[87] In this case, the farmers had contractually recognized the seniority of Denver's rights over their own in a settlement of an earlier dispute in exchange for Denver's promise not to reuse any water, regardless of source, that "shall have been once used through its municipal water system" for the benefit of the farmers.[88] The outcome in *Fulton Irrigating Ditch Co.* would not have depended on the existence of the contract if the water had not been imported from outside the watershed.[89]

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83. Dellapenna, *supra* note 80, at 358–65.

84. 506 P.2d 144 (Colo. 1972). *See generally* Stephen F. Williams, *Optimizing Water Use: The Return Flow Issue*, 44 U. COLO. L. REV. 301, 311–21 (1973).

85. *Fulton Irrigating Ditch Co.*, 506 P.2d at 151.

86. *Id.* at 151–53.

87. *Id.* at 146–49.

88. *Id.* at 151.

89. *See* Santa Fe Trail Ranches Prop. Owners Ass'n v. Simpson, 990 P.2d 46 (Colo. 1999); Orr v. Arapahoe Water & Sanitation Dist., 753 P.2d 1217 (Colo. 1988); CF&I Steel Corp. v. Rooks, 495 P.2d 1134 (Colo. 1972).

Where administered by irrigation districts, appropriative rights are applied to contained service areas. Where claimed by individuals, or smaller districts, service areas from given streams are generally scattered. "First in time, first in right" puts a premium on jumping the gun. The farther one is from a source, and the more convenient it is to others, the greater the motive to get there first to preclude them. So, typically, the first claimants on a source are scattered; soon the supply is fully claimed, and the included dry lands can never get water from this source. They can, however, search about for other more remote sources. The results need not be imagined; they may be observed throughout the arid states.[90] Recent legal innovations designed to protect areas of origin have had very limited impacts.[91]

The amount of water that complaisant courts will recognize as being used beneficially is a function of, among other things, the amount of land that the user has.[92] So this doctrine tends to distribute public water to those who already own private land, in proportion to the size of the landholding. Traditionally, no effort was made to protect the public interest in the waters of the state or to distribute their fruits among the disadvantaged of society.[93] Many appropriative rights states have now enacted statutes to require consideration of the public interest in evaluating applications to make a new appropriation.[94] These statutes, however, do not apply to existing water rights and thus have little practical effect in most water basins in which most or all available water has already been appropriated.[95] Whether in to-

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90. *See* State *ex rel* Carey v. Cochran, 292 N.W. 239 (Neb. 1940).

91. *See, e.g.*, CAL. WATER CODE §§ 10505, 10505.5 (West 1992). *See generally* LAWRENCE J. MACDONNELL ET AL., GUIDELINES FOR DEVELOPING AREA-OF-ORIGIN COMPENSATION (1985); NAT'L RES. COUNCIL, *supra* note 81, at 78–79, 114–15, 225–32, 243–44, 257–59; Robert Abrams, *Interbasin Transfer in a Riparian Jurisdiction*, 24 WM. & MARY L. REV. 591 (1983); J. David Aiken, *New Directions in Nebraska Water Policy*, 66 NEB. L. REV. 8 (1987); Kaiser, *supra* note 81, at 215–18, 251–53; Lawrence J. MacDonnell & Charles W. Howe, *Area-of-Origin Protection in Transbasin Water Diversions: An Evaluation of Alternative Approaches*, 57 U. COLO. L. REV. 527 (1986); Gregory S. Weber, *Twenty Years of Local Groundwater Export Legislation in California: Lessons from a Patchwork Quilt*, 34 NAT. RESOURCES J. 657 (1994).

92. This is made explicit in laws defining a "duty of water"—amount of water that may be used lawfully to irrigate acreages of particular crops. *See, e.g.*, Farmers Highline Canal & Reservoir Co. v. City of Golden, 272 P.2d 629 (Colo. 1954); McDonald v. State, 722 P.2d 598 (Mont. 1986); Enterprise Irrigation Dist. v. Willis, 284 N.W. 326 (Neb. 1939); State Dep't of Ecology v. Grimes, 852 P.2d 1044 (Wash. 1993); Quinn v. John Whitaker Ranch Co., 92 P.2d 568 (Wyo. 1939).

93. Gaffney, *supra* note 40, at 138.

94. *See, e.g.*, E. Bay Mun. Util. Dist. v. Dep't of Pub. Works, 35 P.2d 1027 (Cal. 1934); Collins Bros. v. Dunn, 759 P.2d 891 (Idaho 1988); Shokal v. Dunn, 707 P.2d 441 (Idaho 1985); Young & Norton v. Hinderlider, 110 P. 1045 (N.M. 1910). *See generally* Goplerud, *supra* note 63, § 15.03(c)(3).

95. *See, e.g.*, *Collins Bros.*, 759 P.2d at 891; *Shokal*, 707 P.2d at 441. Two states seem to have defined the "public interest" as depending upon a cost-benefit analysis rather than

day's economy distributive equity favors protecting endangered species and providing water for other public values rather than for irrigation is at least an open question.[96]

C. The Failure of Appropriative Rights in the East

Despite the difficulties in the actual realization of private property rights in water under appropriative rights, the Pacific coast states, from Alaska to California, and the high plains states, from North Dakota to Texas, all eventually adopted appropriative rights to replace an earlier system of riparian rights.[97] Generally, legislation brought about the change. The legislatures were unable to abolish riparian rights completely through inability or unwillingness to compensate the owners of riparian rights. Instead, the legislature chose to preserve as valid riparian rights uses that existed on the effective date of the first appropriative rights statute.[98] Even

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something more wide-ranging than a purely economic analysis. *See* ALASKA STAT. § 46.15.80(b) (LEXIS 2000); WASH. REV. CODE § 90.54.020(2) (2000); Stempel v. Dep't of Water Res., 508 P.2d 166 (Wash. 1973). *See generally* Norman K. Johnson & Charles T. DuMars, *A Survey of the Evolution of Western Water Law in Response to Changing Economic and Public Interest Demands*, 29 NAT. RESOURCES J. 347 (1989).

96. *See, e.g.*, Reed Benson, *A Watershed Issue: The Role of Streamflow Protection in Northwest River Basin Management*, 26 ENVTL. L. 175 (1996); Lawrence J. MacDonnell, *Managing Reclamation Facilities for Ecosystem Benefits*, 67 U. COLO. L. REV. 197 (1996); Michael R. Moore et al., *Water Allocation in the American West: Endangered Fish Versus Irrigated Agriculture*, 36 NAT. RESOURCES J. 319 (1996); Carmen Sower-Hall & Holly I. Holder, *Water Quality Issues in Augmentation Plans and Exchanges*, 1 U. DENV. WATER L. REV. 96 (1997); A. Dan Tarlock, *River Management in the Twenty-First Century: The Vision Thing*, 6 RIVERS 43 (1997); Alexandra E. Viscusi, *Conflicting Directives: Water Quality and Appropriative Water Rights in the West*, 20 WM. & MARY ENVTL. L. & POL'Y REV. 121 (1995); Wendy Weiss, *The Federal Government's Pursuit of Instream Flow Water Rights*, 1 U. DENV. WATER L. REV. 151 (1998).

97. *See* Lux v. Haggin, 10 P. 674 (Cal. 1886). *See generally* Dellapenna, *supra* note 1, ch. 8.

98. *See* Cal. Or. Power Co. v. Beaver Portland Cement Co., 295 U.S. 142 (1935); Baumann v. Smrha, 145 F. Supp. 617 (D. Kan. 1956), *aff'd mem.*, 352 U.S. 863 (1956); F. Arthur Stone & Sons v. Gibson, 630 P.2d 1164 (Kan. 1981); City of Hesston v. Smrha, 391 P.2d 93 (Kan. 1964); Williams v. City of Wichita, 374 P.2d 578 (Kan. 1962), *appeal dismissed*, 375 U.S. 7 (1963); State *ex rel.* Emery v. Knapp, 207 P.2d 440 (Kan. 1949); Hickman v. Loup River Pub. Power Dist., 113 N.W.2d 617 (Neb. 1962); *In re* Application of Ainsworth Irrigation Dist., 102 N.W.2d 429 (Neb. 1960); Baeth v. Hoisveen, 157 N.W.2d 728 (N.D. 1968); City of Stillwater v. Okla. Water Res. Bd., 524 P.2d 938 (Okla. 1974); Okla. Water Res. Bd. v. Cent. Okla. Master Conservancy Dist., 464 P.2d 748 (Okla. 1969); *In re* Hood River, 227 P. 1065 (Or. 1924), *appeal dismissed sub nom.* Pac. Power Co. v. Bayer, 273 U.S. 647 (1926); Norwood v. E. Or. Land Co., 227 P. 1111 (Or. 1924); *In re* Willow Creek, 144 P. 505 (Or. 1914), *modified on reh'g*, 146 P. 475 (1915); Belle Fourche Irrigation Dist. v. Smiley, 176 N.W.2d 239 (S.D. 1970); Knight v. Grimes, 127 N.W.2d 708 (S.D. 1964); *In re* Medina River, 670 S.W.2d 250 (Tex. 1984); *In re* Upper Guadalupe River, 642 S.W.2d 438 (Tex. 1982); *In re* Deadman Creek, 694 P.2d 1071 (Wash. 1985); Brown v.

though most transitions took place when existing water uses were relatively few in these states, the result was a dual system that combined the worst features of both bodies of law.[99]

Mississippi became the only state to the east of Kansas City to adopt a dual system in 1955.[100] Mississippi's experience suggests why it would be futile to import appropriative rights into the hydrologically more developed regions east of Kansas City.[101] During the thirty years that Mississippi had an appropriative rights statute on the books, not one court in Mississippi ever referred to that statute even though there were numerous legal disputes over the allocation of water.[102]

Maybe the lack of mention of an appropriation statute in any Mississippi case during this period simply reflects a failure to educate the bar and the judiciary on its existence or its provisions. Still, it is remarkable that not one judge (and presumably not one lawyer) found the statute and considered it worth mentioning in any relevant reported case decided during this period. On deeper reflection, however, one might conclude that the appropriation statute was not mentioned because it could have had little to contribute to the resolution of disputes over water in Mississippi. The reason is fairly obvious. Most consumptive uses of water had begun before 1955, and claiming an appropriative right would only concede priority to an opponent claiming a riparian right. Either the riparian right would prevail as the earliest appropriation,[103] or the appropriative right would be a permissive nonriparian use that must fail in competition with a riparian use.[104]

The best that an appropriator could hope would be that the appropriative use would be balanced against the complaining riparian's use, which brings one full circle back to the reasonable use version of riparian rights.[105] If an acute general water shortage should develop, rather than having a more secure title than a riparian, the appropriator would simply find no water.

Chase, 217 P. 23 (Wash. 1923). *But see* Franco-Am. Charolaise, Ltd. v. Okla. Water Res. Bd., 855 P.2d 568 (Okla. 1990) (attempting to cut-off unused riparian rights is void as an attempted taking without compensation).

99. Dellapenna, *supra* note 1, §§ 8.03–.04.

100. MISS. CODE ANN. §§ 51-3-3(g)(3) to 51-3-7 (1972). *See generally* William Champion, *Prior Appropriation in Mississippi—A Statutory Analysis*, 39 MISS. L.J. 1 (1967).

101. Dellapenna, *supra* note 1, § 8.05.

102. *See* Anderson-Tully Co. v. Franklin, 307 F. Supp. 539 (N.D. Miss. 1969); Haisch v. Southhaven Land Co., 274 F. Supp. 392 (N.D. Miss. 1967); Phillips v. Davis Timber Co., 468 So. 2d 72 (Miss. 1985); Black v. Williams, 417 So. 2d 911 (Miss. 1982); Hinds-Rankin Metro. Water Ass'n v. Reid, 256 So. 2d 373 (Miss. 1971); Downes v. Crosby Chem., Inc., 234 So. 2d 916 (Miss. 1970).

103. *See* Dellapenna, *supra* note 1, § 8.04(a).

104. *Id.* § 8.04(b).

105. *See, e.g.*, Wasserburger v. Coffee, 141 N.W.2d 738 (Neb. 1966), *modified on other grounds*, 144 N.W.2d 209 (Neb. 1966); Franco-Am. Charolaise, Ltd. v. Okla. Water Res. Bd., 855 P.2d 568 (Okla. 1990). *See* Dellapenna, *supra* note 1, § 8.04(b) nn.441–47.

Finally, the added level of uncertainty that the duality of the system provides would actually ensure that no markets would arise to remedy the defects of the bureaucratic system that would have been established to administer appropriative rights.[106]

When Mississippi repealed its appropriative rights statute, it gave all persons claiming rights vested under the appropriation statute one year to file a document expressing an intent to preserve their appropriative right.[107] So far as I have been able to determine, no such documents were filed. Mississippi did not, however, abandon the sort of regulated system of water allocation that characterizes modern appropriative rights[108] in favor of a return to the unregulated system of traditional riparian rights. Instead, Mississippi replaced its appropriative rights system with another highly regulated system of water allocation—the public property system of regulated riparianism.[109]

In short, the Mississippi example strongly suggests that adding appropriative rights to an economically mature, humid eastern state hitherto committed to riparian rights would add little, if anything, in terms of rational water management at a cost of establishing and maintaining the considerable bureaucratic machinery inherent to modern appropriative rights. This reality ought to be quite enough to preclude serious consideration of western-style appropriative rights in the eastern United States even without considering the further arguments about the monopolistic and environmentally unsound biases of appropriative rights.[110] As a result, eastern states wishing to make a sharp departure from the more or less pure riparian rights tradition uniformly have gone not in the direction of appropriative rights but in the direction of the fundamentally different system of regulated riparianism.

IV. REGULATED RIPARIANISM

Since the 1950s, about half of the states east of Kansas City, along with Hawaii, have deployed administrative permit systems to replace tradition riparian rights.[111] Rather than importing appropriative rights into the East, however, these states have developed a highly regulated system of water administration based on riparian principles that could best be de-

106. See *supra* note 80 for authorities on the dearth of true markets for water. *See generally supra* text accompanying notes 46–48, 79–88.

107. MISS. CODE ANN. §§ 51-3-5(2)–(3), 51-3-29(a)–(c) (2002).

108. *See generally* Anderson et al., *supra* note 4, at chs. 14–17.

109. MISS. CODE ANN. §§ 51-3-1 to -15 (2002).

110. *See supra* text accompanying notes 67–78, 89–94.

111. *See generally* Dellapenna, *supra* note 10.

scribed as a transition to a system of public property.[112] The transition from extremely limited regulatory intervention to more or less comprehensive regulation often occurred incrementally rather than from a conscious design to revolutionize the system of water rights. As a result, there is disagreement over when to date the emergence of a true regulated riparian system, and even today one could debate whether certain states have in fact crossed the boundary from relying largely on unregulated common law riparian rights to a regulated riparian system. Bearing this in mind, the following list indicates the states that have enacted regulated riparian systems and the approximate date of that adoption: Alabama (1993);[113] Arkansas (1957);[114] Connecticut (1982);[115] Delaware (1959);[116] Florida (1972);[117] Georgia (1977);[118] Hawaii (1987);[119] Iowa (1957);[120] Kentucky (1966);[121] Maryland (1957);[122] Massachusetts (1985);[123] Minnesota (1973);[124] Mississippi (1985);[125] New Jersey (1965);[126] North Carolina (1973);[127] New York (1979);[128] Virginia (1989);[129] and Wisconsin (1957).[130] In addition, several states have applied a regulated riparian system to groundwater without applying it to surface waters.[131]

Even now, there is no fully recognized name for the new system of water allocation law. Peter Davis has suggested that the new regulatory system should be called "non-temporal priority permit systems."[132] This term certainly aptly describes the new system, but it is a bit too much of a mouthful to expect people to say (or write) very often. Others have simply given up

112. *See* Dellapenna, *Introduction*, *supra* note 2, § 6.01(b)(1).
113. ALA. CODE §§ 9-10B-1 to -30 (LEXIS Repl. 2001).
114. ARK. CODE ANN. §§ 15-22-201 to -622 (LEXIS Repl. 2000).
115. CONN. GEN. STAT. §§ 22a-365 to -380 (1995).
116. DEL. CODE ANN. tit. 7, §§ 6001–6031 (Michie Repl. 2001).
117. FLA. STAT. ANN. §§ 373.012–.619 (West 2000 & Supp. 2001).
118. GA. CODE ANN. §§ 12-5-20 to -31, 12-5-43 to -53 (LEXIS 2001).
119. HAW. REV. STAT. §§ 174C-1 to -101 (Repl. 1993 & Supp. 2001).
120. IOWA CODE ANN. §§ 455B.261–.281 (West 1997 & Supp. 2002).
121. KY. REV. STAT. ANN. §§ 151.010–.600, 151.990 (LEXIS Repl. 2001).
122. MD. CODE ANN., ENVIR. §§ 5-501 to -514 (Michie Repl. 1996).
123. MASS. GEN. LAWS ch. 21G, §§ 1-19 (1994).
124. MINN. STAT. ANN. §§ 103G.001–.315 (West 1997).
125. MISS. CODE ANN. §§ 51-3-1 to -55 (1999).
126. N.J. STAT. ANN. §§ 58:1A-1 to -17 (West 1992).
127. N.Y. ENVTL. CONSERV. LAW §§ 15-1501 to -1529 (McKinney 1997).
128. N.C. GEN. STAT. §§ 143-215.11–.22K (2001).
129. VA. CODE ANN. §§ 62.1-242 to -253 (Michie Repl. 2001).
130. WIS. STAT. §§ 30.18, 30.28, 30.292–.298, 281.35 (1999–2000).
131. *See* ARIZ. REV. STAT. ANN. §§ 45-401 to -655 (West 1994 & West Supp. 2001); 525 ILL. COMP. STAT. ANN. §§ 45/1–45/7 (West 1993 & Supp. 2002); IND. CODE §§ 14-25-4-1 to -21 (1998); S.C. CODE ANN. §§ 49-5-10 to -150 (Law. Co-op. 1987 & West Supp. 2001).
132. Peter Davis, *Australian and American Water Allocation Systems Compared*, 9 B.C. INDUS. & COM. L. REV. 647, 697–705 (1968).

trying to use a name that tells anything about the system, tending to call the new system simply "eastern permit systems."[133] The name "regulated riparianism," which I devised some twenty years ago,[134] offends those to whom the words "regulate" and "riparian" are polar opposites.[135] It has the virtue, however, of emphasizing both that the administrative permit process proceeds on essentially riparian principles and that the new system is a regulation of—rather than a taking of—riparian rights.[136] In short, "regulated riparianism" appears to be about as succinctly descriptive a name as one can hope for. In recent years, this name has begun to gain a more general acceptance.[137]

Little has been written about regulated riparianism, and most of what has been written on the topic viewed regulated riparian statutes as minor modifications superimposed on the riparian rights that the authors saw as remaining the core of the law in these states.[138] Others construed regulated riparian statutes as inartfully drafted appropriative rights statutes.[139] Few commentators have realized that regulated riparianism represents a truly different model of water law. The following summary description of regulated riparianism is based on the common core principles found from exam-

133. *See, e.g.*, A SUMMARY DIGEST OF STATE WATER LAWS 22–23 (Richard Dewsnup & Dallin Jensen eds., 1973).

134. Joseph W. Dellapenna, *Owning Water in the Eastern United States*, *in* 6 PROC. E. MINERAL L. FNDTN. at 1-33 to 1-34 (1985).

135. *See, e.g.*, Frank J. Trelease, *The Model Water Code, the Wise Administrator, and the Goddam Bureaucrat*, 14 NAT. RESOURCES J. 207, 211–13 (1974).

136. Dellapenna, *supra* note 10, § 9.01.

137. *See, e.g.*, JOSEPH L. SAX ET AL., LEGAL CONTROL OF WATER RESOURCES 80–92 (3d ed. 2000); Robert E. Beck, *The Regulated Riparian Model Water Code: Blueprint for Twenty-First Century Water Management*, 25 WM. & MARY L. & POL'Y REV. 113 (2000); William Cox, III, *The Alabama Water Resources Act: A Hybrid Model of "Regulated Riparianism,"* *in* WATER LAW: TRENDS, POLICIES, AND PRACTICES 151, 163 n.4 (Kathleen Marion Carr & James Crammond eds., 1995); MacDougal, *Private Hopes*, *supra* note 52, at 18; Judith V. Royster, *Winter in the East: Tribal Reserved Water Rights to Water in Riparian States*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 169, 188–91 (2000); George William Sherk, *The Regulated Riparian Model State Water Code: Perspectives on the Relationship Between Water Quantity and Water Quality*, 7 RIVERS 1 (1999); A. Dan Tarlock, *Reconnecting Property Rights to Watersheds*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 69, 90–91 (2000).

138. *See, e.g.*, Scott & Coustalin, *supra* note 51, at 899–901 (describing statutory—i.e., regulated riparian—permit systems as hastily enacted and not fitting with other bureaucratic systems in the state or province of enactment, as well as being of little consequence and not robust enough to deal with any true crisis). *See also* Richard Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 WM. & MARY L. REV. 547 (1983); Peter Davis, *Eastern Water Diversion Permit Statutes: Precedents for Missouri*, 47 MO. L. REV. 429 (1982).

139. *See, e.g.*, George William Sherk, *Eastern Water Law*, 1 NAT. RESOURCES & ENV'T 7 (1986); Frank J. Trelease, *A Water Management Law for Arkansas*, 6 U. ARK. LITTLE ROCK L.J. 369 (1983).

ining the actual regulated riparian statutes and also on the Regulated Riparian Model Water Code ("Model Water Code") of the American Society of Civil Engineers ("Society").[140] The Model Water Code is now in the process of being approved as an official standard of the Society. No state has a system precisely like the one described here, although several come very close.[141] References here are provided in the text to the Model Water Code that deal with the points being mentioned and to the relevant chapter of the treatise *Waters and Water Rights*. These are the most convenient sources for understanding the structure and application of regulated riparianism. Both include detailed commentaries explaining the various provisions and exhaustive references to actual regulated riparian statutes.

A. Differences from Riparian Rights

The most fundamental departure from common law riparian rights in the regulated riparian statutes is the requirement that generally no water is to be withdrawn from a water source without a permit from the state where the withdrawal occurs.[142] The rights of water users are determined by the permits, not by the riparian nature of the use, yet the criterion by which permit applications are judged is whether the proposed use is a reasonable use of the water.[143] Under regulated riparianism, the criterion of reasonable use is applied very differently than at common law. The most important difference is that an administering agency decides before a use begins whether it is reasonable, both in terms of general social policy and in terms of the effects of the proposed use on other permitted uses.[144]

The administering agency is charged to make the permit subject to conditions designed to protect other lawful users and public values.[145] The statutes often contain preferences for certain classes of uses.[146] Temporal priority has been accorded a strictly limited role in the permit process.[147]

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140. AM. SOC'Y OF CIVIL ENG'RS, THE REGULATED RIPARIAN MODEL WATER CODE: FINAL REPORT OF THE WATER LAWS COMMITTEE (Joseph W. Dellapenna ed., 1997) [hereinafter MODEL CODE].

141. *See* Dellapenna, *supra* note 10.

142. MODEL CODE, *supra* note 140, § 6R-1-01; Dellapenna, *supra* note 10, § 9.03(a).

143. MODEL CODE, *supra* note 140, §§ 2R-1-01, 2R-2-20, 6R-3-01 to -02; Dellapenna, *supra* note 10, § 9.03(b). Some jurisdictions would substitute the terms "beneficial," "reasonable-beneficial," or "equitable" for "reasonable."

144. MODEL CODE, *supra* note 140, §§ 6R-2-01 to -08, 6R-3-02, 6R-3-05; Dellapenna, *supra* note 10, §§ 9.03(a)(5)(A), 9.03(b).

145. MODEL CODE, *supra* note 140, § 7R-1-01; Dellapenna, *supra* note 10, §§ 9.03(a)(5)(A), 9.05.

146. MODEL CODE, *supra* note 140, §§ 6R-1-02, 6R-3-04; Dellapenna, *supra* note 10, §§ 9.03(a)(3), 9.05(c).

147. MODEL CODE, *supra* note 140, §§ 6R-1-03, 6R-3-02; Dellapenna, *supra* note 10, § 9.03(a)(b)(3).

Nor are the traditional preferences for riparian land continued. Uses on non-riparian land are no longer unreasonable per se; often one of the principle motives of the enactment of a regulated riparian statute is to authorize the use of water on non-riparian land.[148] Finally, in many states, permits are issued only for a period of time (three to twenty years).[149] When a permit expires, the continued reasonableness of the use can be reexamined. The Model Water Code sets twenty years as the duration of the permits.

Regulated riparian statutes contain elaborate enforcement provisions, including criminal penalties,[150] civil penalties,[151] injunctions,[152] administrative orders,[153] and actions for public and private damages.[154] Such statutes also provide for hearings within the agency[155] and judicial review of agency decisions.[156] The Model Water Code also includes provisions designed to support alternative dispute resolution[157] and the administrative resolution of disputes among permit holders[158]—provisions not generally found in actual regulated riparian statutes.

While users are sometimes required to pay fees to the agency for the permits based on the amount of water they will use, these fees cannot be considered payment for the water itself.[159] This is clear when the fees are a set, uniform charge irrespective of the nature of the use or the amount of water used. Even when the fee is variable, however, it is set according to the presumed ability of the user to pay, rather than according to the value that could be created through use of the water. The Model Water Code breaks new ground in this respect, requiring water use fees that, to some extent at least, reflect the use value of the water.[160]

Such extensive statutory requirements are based on a state's police power to regulate water withdrawal and use in order to protect the public

148. MODEL CODE, *supra* note 140, § 2R-1-02; Dellapenna, *supra* note 10, § 9.03(a)(2).

149. MODEL CODE, *supra* note 140, § 7R-1-02; Dellapenna, *supra* note 10, § 9.03(a)(4).

150. MODEL CODE, *supra* note 140, §§ 5R-5-01 to -03; Dellapenna, *supra* note 10, § 9.03(a)(5)(B) nn.479, 484, 499–536, 547–50.

151. MODEL CODE, *supra* note 140, §§ 5R-4-06 to -08; Dellapenna, *supra* note 10, § 9.03(a)(5)(B) nn.480, 534–41.

152. MODEL CODE, *supra* note 140, § 5R-4-04; Dellapenna, *supra* note 10, § 9.03(a)(5)(B) nn.478, 535, 542–46.

153. MODEL CODE, *supra* note 140, § 5R-4-03; Dellapenna, *supra* note 10, § 9.03(a)(5)(B) nn.482–83, 537–38.

154. MODEL CODE, *supra* note 140, § 5R-4-05; Dellapenna, *supra* note 10, § 9.03(a)(5)(B) nn.485, 498.

155. MODEL CODE, *supra* note 140, §§ 5R-1-01 to -03.

156. *Id.* Courts have generally been very deferential in reviewing agency decisions under regulated riparian statutes.

157. *Id.* §§ 5R-2-01 to -02; Dellapenna, *supra* note 10, nn.486–88, 494–97.

158. MODEL CODE, *supra* note 140, § 5R-2-03; Dellapenna, *supra* note 10, § 9.03(c).

159. Dellapenna, *supra* note 10, § 9.03(a)(5)(C).

160. MODEL CODE, *supra* note 140, § 4R-1-08.

health, safety, and welfare.[161] Still, fear of the political (if not the legal) repercussions of such radical interference with traditional water rights has led many state legislatures to exempt from the permit requirement some large classes of users (usually agricultural) who were using water when the new statute came into effect.[162] This introduces a significant temporal element. A more sophisticated solution to this problem is to guarantee existing users an initial permit, thereafter subject to renewal on the same terms as any other permit.[163] This approach limits the temporal preference to a single permit cycle.[164] Users who refuse to apply for a permit within a short period of time can then be conclusively presumed to have abandoned their claim.[165]

Regulated riparian statutes create mechanisms for long-term planning[166] and otherwise provide for the public interest in the waters of the state.[167] One of the major purposes of regulated riparian permits is to assure the gathering of the necessary information to enable such planning to occur on an on-going basis. The Model Water Code would establish a particularly comprehensive statewide data system.[168] The administering agency is usually given broad discretion to plan for and to deal with crises brought on by extreme water shortages.[169] The agency can incorporate permit conditions based on its plans.[170] The administering agency also is often authorized to restrict uses should the agency's plans prove inadequate to an actual shortage notwithstanding any inconsistency with a permit.[171] There is some evidence, however, that administering agencies prefer to use temporal priority or pro rata sharing as the allocative methods least likely to provoke litigation or other difficulties for the agency.[172] This approach sabotages the whole scheme of regulated riparianism, based as it is on expert appraisal of

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161. State v. Braun, 378 A.2d 640 (Del. 1977); Vill. of Tequesta v. Jupiter Inlet Corp., 371 So. 2d 663 (Fla. 1979); Iowa Natural Res. Council v. Van Zee, 158 N.W.2d 111 (Iowa 1968); Crookston Cattle Co. v. Minn. Dep't of Natural Res., 300 N.W.2d 769 (Minn. 1980); Herschman v. State, 225 N.W.2d 841 (Minn. 1975); State v. Kuluvar, 123 N.W.2d 699 (Minn. 1963); Omernik v. State, 218 N.W.2d 734 (Wis. 1974). *See generally* Dellapenna, *supra* note 10, § 9.04(a).

162. Dellapenna, *supra* note 10, § 9.03(a)(3).

163. MODEL CODE, *supra* note 140, § 6R-1-03.

164. Dellapenna, *supra* note 10, § 9.03(b)(3).

165. *Cf.* United States v. Locke, 471 U.S. 84 (1985) (cutting off mining claims); *In re* Deadman Creek Drainage Basin, 694 P.2d 1071 (Wash. 1985) (cutting off riparian rights in favor of appropriative rights).

166. MODEL CODE, *supra* note 140, §§ 4R-2-01 to -04; Dellapenna, *supra* note 10, § 9.05(a).

167. Dellapenna, *supra* note 10, § 9.05(b)–(d).

168. MODEL CODE, *supra* note 140, § 4R-2-03.

169. *Id.* §§ 7R-3-01 to -07; Dellapenna, *supra* note 10, § 9.05(d).

170. MODEL CODE, *supra* note 140, § 7R-1-01.

171. *Id.* § 7R-3-01.

172. Dellapenna, *supra* note 10, § 9.05(d) n.954.

which uses will best serve the needs of society and eschewing any simple rule of allocation without evaluation of social utility.

Today, the main threats to the availability of water in eastern states, as to both quantity and quality, are not pollution or withdrawal, but the man-made physical and ecological transformation of water sources and the lands on or in which the sources are found. Regulated riparian water statutes address these problems in two ways that are very different from the statutes in western states. First, in eastern states both the management of water allocation and water quality issues are usually vested in a single agency—an agency charged to integrate the consideration and granting of permits for water use in light of both sets of policies.[173] Second, regulated riparian codes usually require the agency to define and protect some minimum flow, whether historic average low flow, the amount necessary for the preservation of certain kinds of wildlife, or the amount necessary to protect human health or well-being.[174] In a few states whole streams may be withdrawn from private use except for those uses existing before the transition to the new system of law. There may be provisions authorizing yet other kinds of conditions designed to protect aesthetic or ecological concerns. The Model Water Code requires the protection of the biological, chemical, and physical integrity of the water source, defined in terms of federal and other relevant legal standards.[175]

B. Unsolved Problems

Regulated riparianism has certain as yet unsolved problems relating to the protection of private values and to the furtherance of public values. Two problems relate to private values—security of investment and the transfer of water to higher valued uses. Investment security would appear to be a problem if the time period of a permit is too short, leaving too little time for the initial cost of a project to be recovered before the permit expires.[176] Additional uncertainty could arise when the administering agency has the power, as is often the case, to modify permits in light of new developments, such as unforeseen water shortages.[177] In the actual operation of regulated riparian systems, however, neither investment nor transfer insecurities seem to have caused actual difficulty. If anything, administering agencies might be accused of being too sensitive to the fears of large institutional investors in water. Administering agencies seldom flatly refuse to renew a permit, although new and more stringent conditions are sometimes attached at the

173. MODEL CODE, *supra* note 140, §§ 4R-3-04, 6R-4-04.
174. Dellapenna, *supra* note 10, § 9.05(b).
175. MODEL CODE, *supra* note 140, §§ 3R-2-01 to -05.
176. Dellapenna, *supra* note 10, § 9.03(a)(4).
177. *Id.* §§ 9.03(d), 9.05(d).

time of renewal. Furthermore, administering agencies have consulted with major water users in crafting responses to water emergencies rather than making their own expert determinations regarding the matter.[178]

Usually there is no express provision for the transfer of water rights or permits between potential users.[179] The Model Water Code actually charges the administering agency to encourage market transfers of water.[180] Given the dearth of markets under appropriative rights, however, it remains unclear whether a market could develop to facilitate the transfer of water used under regulated riparian permits to higher valued uses.[181] Theoretically, one purpose of the regulated riparian system is to enable the administering agencies to force such transfers through the non-renewal of permits.[182] In practice, however, the agencies free up far less water through the renewal process than theory suggests because the agencies prefer to tighten conditions on existing uses rather than to deny renewals outright.[183] Non-renewal of permits will remain an infrequent and cumbersome device unless the state is willing to create a good deal of investment insecurity.

Occasional preferences regarding fees are based on relative inability to pay rather than the value of the use.[184] These provisions can be seen as a form of distributive equity. Such equity arguably justifies exemptions from the permit requirement or other preferences conferred on small users or on other users unable to pay for the full value of the water they need. The result, however, will be the continued use of water for low-value uses rather than its transfer to higher value uses for which, in extreme cases, water might not be available.

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178. *See, e.g.*, Greg Bouwer, *Water Resources: East Coast Drought Could Challenge Outdated Plans*, CIVIL ENG'G, Apr. 2002, at 30; Lesley-Ann Dupigny-Giroux, *Towards Characterizing and Planning for Drought in Vermont—Part I: A Climatological Perspective*, 37 J. AM. WATER RESOURCES ASS'N 505 (2001); Tom Avril & Edward Colimore, *The Drought and How We Got There: Lack of Rain a Factor; so Is Poor Planning*, PHILA. INQUIRER, Apr. 14, 2002, at A1; Tom Avril, *There Are No Limits on Biggest Water Users: Drought Rules Don't Apply to Industry and Farms*, PHILA. INQUIRER, Mar. 11, 2002, at A1; John-Thor Dahlburg, *Drought Compounded by Error in Judgment*, PHILA. INQUIRER, Apr. 22, 2001, at A21.

179. Dellapenna, *supra* note 10, § 9.03(d).

180. MODEL CODE, *supra* note 140, §§ 1R-1-07, 7R-2-01 to -04, 7R-3-05, 9R-1-01 to -02.

181. See *supra* note 80 for authorities on the dearth of true markets for water. *See generally supra* text accompanying notes 46–48, 79–88.

182. MODEL CODE, *supra* note 140, § 7R-1-02.

183. *See* Dellapenna, *supra* note 10, § 9.03(a)(4) nn.428–32.

184. *Id.* § 9.03(a)(5)(C). *See also* Frank E. Matthews & Gabriel E. Nieto, *Florida Water Policy: A Twenty-Five Year Mid-Course Correction*, 25 FLA. ST. U. L. REV. 365, 373–75 (1998).

This analysis leads to the bottom line: Is such a system worth its costs?[185] Clearly there will be significant financial costs in administering a regulated riparian system, and the tendency of government bureaucracies to replicate their errors throughout the state is another substantial cost. Yet given the increasing failure of traditional riparian rights (a common property system) to cope with the needs of modern societies,[186] and the only slightly better performance of appropriative rights (as close to a private property system as we are likely to achieve), there seems little choice but to move to a regulated riparian system (a public property system).[187] Regulated riparianism is not a perfect system, but it would appear to be best suited to the cultural, economic, legal, hydrologic, and political settings of eastern states.

V. GROUNDWATER

"Groundwater" refers to all water beneath the surface of the ground, and in particular to water that can extracted by a well or water that gives forth a spring.[188] Scientists have long delighted in pointing out to lawyers that all waters are interrelated in one continuous hydrologic cycle.[189] As a

185. Dellapenna, *supra* note 10, § 9.05(a)(5)(D). *See also* Robert Abrams, *Water Allocation by Comprehensive Permit Systems in the East: Considering a Move Away from Orthodoxy*, 9 VA. ENVTL. L.J. 255, 257–70 (1990); Butler, *supra* note 43; Davis, *supra* note 138, at 453–56; Dellapenna, *supra* note 80, at 367–70, 375–77; Freyfogle, *supra* note 50, at 510–19; James M. Klebba, *Water Rights and Water Policy in Louisiana: Laissez-Faire Riparianism, Market-Based Approaches, or a New Managerialism*, 53 LA. L. REV. 1779 (1993); J.W. Looney, *An Update on Arkansas Water Law: Is the Riparian Rights Doctrine Dead?*, 43 ARK. L. REV. 573 (1990) [hereinafter Looney, *Update*]; J.W. Looney, *Modification of Arkansas Water Law: Issues and Alternatives*, 38 ARK. L. REV. 221 (1984) [hereinafter Looney, *Modification*]; Rose, *supra* note 41; Carol Rose, *Energy and Efficiency in the Realignment of Common-Law Water Rights*, 19 J. LEGAL STUD. 261 (1990); Trelease, *supra* note 135; Trelease, *supra* note 139; David Yoskowitz, *Markets: Mechanisms, Institutions, and the Future of Water*, 31 ENVTL. L. RPTR. 10237 (2001).

186. *See supra* Part II.

187. *See supra* Part III.

188. MICHAEL BARCELONA ET AL., HANDBOOK OF GROUNDWATER PROTECTION 73–74 (1988); RAM GUPTA, HYDROLOGY AND HYDRAULIC SYSTEMS 121–39 (1989); ZACHARY SMITH, GROUNDWATER IN THE WEST 3–4 (1989); Earl Finbar Murphy, *Geology and Hydrology*, *in* 3 WATERS AND WATER RIGHTS, *supra* note 1, § 18.01; Steven Levine, Note, *Ground Water: Louisiana's Quasi-Fictional and Truly Fugacious Mineral*, 44 LA. L. REV. 1123, 1123 (1984).

189. *See, e.g.*, LEONARD RICE & MICHAEL WHITE, ENGINEERING ASPECTS OF WATER LAW 1–11 (1987); J.G. Arnold et al., *Large Area Hydrologic Modeling and Assessment—Part I: Model Development*, 34 J. AM. WATER RESOURCES ASS'N 73 (1998); Sydney Bacchus, *Uncalculated Impacts of Unsustainable Aquifer Yield Including Evidence of Subsurface Interbasin Flow*, 36 J. AM. WATER RESOURCES ASS'N 457 (2000); Herman Bouwer & Thomas Maddock III, *Making Sense of the Interaction Between Groundwater and Streamflow: Lessons for Water Masters and Adjudicators*, 6 RIVERS 19 (1997); Brian Katz et al., *Interactions*

result, it has become fashionable to argue that an effective legal regime should govern water in all of its forms and uses in a consistent and uniform manner.[190] The law is otherwise. Common law courts and legislatures, both

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Between Ground Water and Surface Water in the Suwanee River Basin, Florida, 33 AM. J. WATER RESOURCES ASS'N 1237 (1997); R. Srinivasan et al., *Large Area Hydrologic Modeling and Assessment—Part II: Model Development*, 34 J. AM. WATER RESOURCES ASS'N 91 (1998); Harold Thomas, *Hydrology v. Water Allocation in the Eastern United States*, *in* WATER ALLOCATION IN THE EASTERN UNITED STATES 9–10 (David Haber & Stephen Bergen eds., 1956).

190. *See, e.g.*, United States v. Oregon, 44 F.3d 758, 769 (9th Cir. 1994); Baumler v. Town of Newstead, 668 N.Y.S.2d 814 (N.Y. App. Div. 1998); State *ex rel.* Johnny Appleseed Metro. Park Dist. v. City of Delphos, 750 N.E.2d 1158 (Ohio Ct. App. 2001), *appeal denied*, 747 N.E.2d 253 (Ohio 2001); Tex. Rivers Prot. Ass'n v. Tex. Nat. Res. Conservation Comm'n, 910 S.W.2d 147, 151 (Tex. Ct. App. 1995). *See also* CHARLES CORKER & JAMES CROSBY III, GROUNDWATER LAW, MANAGEMENT AND ADMINISTRATION 48–81, 96–97 (1971); 1 WELLS HUTCHINS, WATER RIGHTS LAWS IN THE NINETEEN WESTERN STATES 59 (Harold Ellis & J. Peter DeBraal eds., 1971); NAT'L WATER COMM'N, WATER POLICIES FOR THE FUTURE 232 (1973); Robert Adler & Michelle Straube, *Watersheds and the Integration of U.S. Water Law and Policy: Bridging the Great Divides*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 1 (2000); Jennie L. Bricker & David E. Filippi, *Endangered Species Act Enforcement and Western Water Law*, 30 ENVTL. L. 735 (2000); Lynda L. Butler, *The Pathology of Property Norms: Living Within Nature's Boundaries*, 73 S. CAL. L. REV. 927 (2000); Sherry Caloia et al., *The Water Rights Determination and Administration Act of 1969: A Western Slope Perspective on the First Thirty Years*, 3 U. DENV. WATER L. REV. 39 (1999); Jon Cannon, *Choices and Institutions in Watershed Management*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 379 (2000); James Castleberry, Jr., *A Proposal for Adoption of a Legal Doctrine of Ground-Stream Interrelationship in Texas*, 7 ST. MARY'S L.J. 503 (1975); Peter Davis, *Wells and Streams: Relationship at Law*, 37 MO. L. REV. 189 (1972); Alyson C. Flournoy, *Restoration Rx: An Evaluation and Prescription*, 42 ARIZ. L. REV. 187 (2000); Frank Foley, *Water and the Laws of Nature*, 5 U. KAN. L. REV. 492 (1957); Robert Jerome Glennon & Thomas Maddock III, *In Search of Subflow: Arizona's Futile Effort To Separate Groundwater from Surface Water*, 36 ARIZ. L. REV. 567 (1994); Janet S. Herman et al., *Groundwater Ecosystems and the Service of Water Purification*, 20 STAN. ENVTL. L.J. 479 (2001); Richard G. Hildreth, *Water Law at the Crossroads*, 14 J. ENVTL. L. & LITIGATION 1, 2–5 (1999); John D. Leshy & James Belanger, *Arizona Law Where Ground and Surface Water Meet*, 20 ARIZ. ST. L.J. 657 (1988); Stephen D. Mossman, *"Whiskey Is for Drinkin' but Water Is for Fightin' About": A First-Hand Account of Nebraska's Integrated Management of Ground and Surface Water Debate and the Passage of L.B. 108*, 30 CREIGHTON L. REV. 67 (1996); Earl Finbar Murphy, *Economics and Groundwater Interconnections*, *in* 3 WATERS AND WATER RIGHTS, *supra* note 1, § 19.03; C. Luther Propst & Peter W. Culp, *Searching for Cibola: A Community-Based Environmental Restoration in the Colorado River Watershed*, 42 ARIZ. L. REV. 259 (2000); Joseph L. Sax, *Environmental Law at the Turn of the Century: A Reportorial Fragment of Contemporary History*, 88 CAL. L. REV. 2375 (2000); Veronica Sperling & David Brown, *Outline of Colorado Ground Water Law*, 1 U. DENV. WATER L. REV. 275, 286–94 (1998); Tarlock, *supra* note 137; Samuel Wiel, *Need of Unified Law for Surface and Underground Water*, 2 S. CAL. L. REV. 358 (1929); Charles Wilkinson, *Western Water Law in Transition*, 56 U. COLO. L. REV. 317, 321–22 (1985); Scott Anderson, Comment, *Watershed Management and Nonpoint Source Pollution: The Massachusetts Approach*, 26 B.C. ENVTL. AFF. L. REV. 339 (1999); Benjamin R. Vance, Comment, *Total Aquifer Management: A New Approach to Groundwater Protection*, 30

historically and currently, have generally divided water into two general categories—surface water and groundwater.[191] Surface waters in turn are classified as either waters in defined bodies or diffused surface waters.[192] Different, albeit often related, legal regimes and doctrines evolved to handle each of these major categories of water, producing law that is so well established that one cannot simply ignore or discard it.[193] Further complicating this picture was the rule defining surface waterbodies, which applies to streams but not percolating groundwater, even though underground streams are legally considered a part of the groundwater.[194]

A. The Absolute Ownership Rule

When the law of groundwater was first formulated in the nineteenth century, courts and legislatures were explicit that their decisions were based upon the fact that they could not determine how groundwater behaved or how it was being used.[195] Thus, courts and legislatures retreated into the proposition that the owner of land held "absolute ownership" of percolating water in the ground.[196] Thus, for example, the Georgia General Assembly indicated explicitly that this lack of knowledge underlay Georgia's adoption of the absolute ownership theory, enacting a statute in 1863 that reads: "The course of a stream of water underground and its exact condition before its first use are so difficult of ascertainment that trespass may not be brought for any supposed interference with the rights of a proprietor."[197]

Courts limited the theory of absolute ownership only in instances where they found that the water was withdrawn maliciously—for the pur-

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U.S.F. L. REV. 803 (1996).

191. *See* Robert E. Beck, *The Legal Regimes*, *in* 1 WATERS AND WATER RIGHTS, *supra* note 1, ch. 4; Dellapenna, *Introduction*, *supra* note 2, §§ 6.02, 6.04; Earl Finbar Murphy, *Legal Classifications*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 1, ch. 20.

192. Dellapenna, *supra* note 52, § 10.03(a).

193. *Id.* § 10.03 (diffused surface water); Earl Finbar Murphy, *Quantitative Groundwater Law*, *in* 3 WATERS AND WATER RIGHTS, *supra* note 1, chs. 18–24.

194. *See, e.g.*, Lingo v. City of Jacksonville, 258 Ark. 63, 522 S.W.2d 403 (1975); Prather v. Hoberg, 150 P.2d 405 (Cal. 1944); City of Colo. Springs v. Bender, 366 P.2d 552 (Colo. 1961); Gorman v. Connell, No. Civ.A.15424, 2001 WL 332054 (Del. Ch. Mar. 30, 2001); Maddocks v. Giles, 686 A.2d 1069 (Me. 1996). *See generally* Dellapenna, *Introduction*, *supra* note 2, § 6.04; Murphy, *supra* note 191, § 20.07.

195. *See generally* Murphy, *supra* note 191, §§ 20.02–.03; Kevin Patrick & Kelly Archer, *A Comparison of State Groundwater Laws*, 30 TULSA L.J. 123, 125–29 (1994).

196. *See, e.g.*, Frazier v. Brown, 12 Ohio St. 294, 311 (1861), *overruled on other grounds by* Cline v. Am. Aggregates Corp., 474 N.E.2d 324 (Ohio 1984) (describing knowledge regarding groundwater as "occult"); Chatfield v. Wilson, 28 Vt. 49, 54 (1855). *See also* Acton v. Blundell, 152 Eng. Rep. 1228 (Ex. Ch. 1843). *See generally* Earl Finbar Murphy, *The Absolute Dominion Rule*, *in* 3 WATERS AND WATER RIGHTS, *supra* note 1, ch. 21.

197. GA. CODE ANN. § 51-9-8 (2001).

pose of hurting another landowner.[198] Courts also found that landowners could be liable for creating a private nuisance or other tort through the pollution of the groundwater.[199] Notwithstanding these limitations, the theory of absolute ownership created the same sort of tragedy of the commons for groundwater as did riparian rights for surface water.[200]

Consider the situation that arises when there is a significant overdraft or even a threat of a significant overdraft on an aquifer, leading to falling water tables, surface subsidence, or (near the coast) salt-water intrusion. Forbearance by any particular absolute owner does nothing to protect the aquifer from the overdraft, but it does deprive the forbearing owner from the benefits of using the resource that is being exhausted by others. As with any tragedy of the commons, the benefit of overpumping is realized almost entirely by those who grab the most, while the cost of overpumping is spread out over all who use water from the same aquifer. The only rational course for each absolute owner is to continue to pump, and indeed to pump at the fastest possible rate in order to maximize that owner's share of the resource before it is exhausted by others. As the resource approaches exhaustion, each water user pumps even faster rather than cutting back, for cutting back only benefits those who continue to pump without abatement while each

198. *See, e.g.*, St. Armand v. Lehman, 47 S.E. 949 (Ga. 1904); Gagnon v. French Lick Springs Hotel, 72 N.E. 489 (Ind. 1904); Springfield Waterworks Co. v. Jenkins, 27 S.W. 862 (Mo. 1895); *Frazier*, 12 Ohio St. at 310–11.

199. *See, e.g.*, Mongrue v. Monsanto Co., 249 F.3d 422 (5th Cir. 2001); Dodge v. Cotter Corp., 203 F.3d 1190 (10th Cir. 2000); Bradley v. Armstrong Rubber Co., 130 F.3d 168 (5th Cir. 1997); Schuefler v. Gen. Host Corp., 126 F.3d 1261 (10th Cir. 1997); Vector-Springfield Prop., Ltd. v. Cent. Ill. Light Co., 108 F.3d 806 (7th Cir. 1997); Conoco Inc. v. ONEOK, Inc., 91 F.3d 1405 (10th Cir. 1996); Westfarm Assocs. L.P. v. Wash. Suburban Sanitary Comm'n, 66 F.3d 669, 683–90 (4th Cir. 1995); Mulcahey v. Columbia Organic Chem. Co., 29 F.3d 148 (4th Cir. 1994); McDowell v. State, 23 P.3d 1165 (Alaska 2001); Parks Hiway Enter., LLC v. CEM Leasing, Inc., 995 P.2d 657 (Alaska 2000); Keeney v. Town of Old Saybrook, 686 A.2d 991 (Conn. 1997); Superior Farm Mgmt., LLC v. Montgomery, 513 S.E.2d 215 (Ga. 1999); Tri-County Inv. Group, Ltd. v. S. States, Inc., 500 S.E.2d 22 (Ga. Ct. App. 1998); Shell Oil Co. v. Meyer, 705 N.E.2d 962 (Ind. 1998); Bartlett v. Browning-Ferris Indus., 683 So. 2d 1319 (La. Ct. App. 1996); Millett v. Atl. Richfield Co., 760 A.2d 250 (Me. 2000); JBG/Twinbrook Metro Ltd. P'ship v. Wheeler, 697 A.2d 898 (Md. 1997); Blackmore v. Mass. Tpk. Auth., No. CA 990971A, 2000 WL 420844 (Mass. Jan. 6, 2000); Mirra v. Murphy, No. 910703, 1999 WL 1318981 (Mass. Jan. 4, 1999); Kempinski v. Mass. Tpk. Auth., No. CA 991277B, 2000 WL 420742 (Mass. App. Ct. Jan. 6, 2000); Zagloba v. Mass. Tpk. Auth., No. CA 941910A, 2000 WL 430854 (Mass. App. Ct. Jan. 6, 2000); Richmond Realty, Inc. v. Town of Richmond, 644 A.2d 831 (R.I. 1994); Coastal Corp. v. Garza, 979 S.W.2d 318 (Tex. 1998). *See generally* Gerry Cross, *Does Only the Careless Polluter Pay?: A Fresh Examination of the Nature of Private Nuisance*, 111 L.Q. REV. 445 (1995); Christine Rosen, *Differing Perceptions of the Value of Pollution Abatement Across Time and Place: Balancing Doctrine in Pollution Nuisance Law, 1840–1906*, 11 LAW & HIST. REV. 303 (1993); Tom Kuhnle, Note, *The Rebirth of Common Law Actions for Addressing Hazardous Waste Contamination*, 15 STAN. ENVTL. L.J. 187 (1996).

200. *See* Hardin, *supra* note 6. *See supra* text accompanying notes 6–8.

gallon of water pumped is more value captured for the operator of the well. The result is a race to pump that only accelerates the destruction of the aquifer.[201] Furthermore, each absolute owner is constantly at risk that someone will install a more powerful pump and simply pump the first user's well dry.[202]

Today, a great deal is known about how groundwater behaves, and information can be obtained about how it is used. To do so, however, is time consuming and expensive.[203] Still, courts and legislatures can no longer rely on an inability to determine the characteristics of an aquifer to justify continued adherence to the rule of absolute ownership. Some courts have, however, refused to change the rule based on the conclusion that to change it would amount to a taking of property.[204] In a state like Texas, the reaffirmation was all the more remarkable given that the state's legislature only two years before had introduced major changes in the regulatory regime for groundwater, without, however, addressing explicitly the basic question of the ownership of groundwater.[205]

B. Alternatives to Absolute Ownership

Given the likely consequences of adhering to the rule of absolute ownership, courts across the land have abandoned that rule in favor of either a

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201. Ronald Kaiser & Frank Skillern, *Deep Trouble: Options for Managing the Hidden Threat of Aquifer Depletion in Texas*, 32 TEX. TECH. L. REV. 249 (2001).

202. *See, e.g.*, MacArtor v. Graylyn Crest III Swim Club, Inc., 187 A.2d 417 (Del. Ch. 1963) (providing no explanation why the court chose to make an equal division of the cost of deepening MacArtor's 200-year-old well that the swim club dewatered when it installed high-powered pumps to fill its pools).

203. *See, e.g.*, Dombrowski v. Gould Elec., Inc., 31 F. Supp. 2d 436 (M.D. Pa. 1998); Land v. United States, 37 Fed. Cl. 231 (1997); City of Mobile v. Lester, 804 So. 2d 220 (Ala. Civ. App. 2001); Donaldson v. Cent. Ill. Pub. Serv. Co., 730 N.E.2d 68 (Ill. App. Ct. 2000); Kaufman v. Sewerage & Water Bd. of New Orleans, 762 So. 2d 644 (La. Ct. App. 2000); Pank v. Vill. of Canajoharie, 712 N.Y.S.2d 210 (N.Y. App. Div. 2000). *See generally* Russell Adams, *Updating Groundwater Law: New Wine in Old Bottles*, 39 OHIO ST. L.J. 520, 531–40 (1978); Davis, *supra* note 190, at 236–37; Symposium, *New Science and Technology*, 13 NAT. RESOURCES & ENVT. 507 (1999).

204. Wiggins v. Braz. Coal & Clay Corp., 452 N.E.2d 958 (Ind. 1983); Sipriano v. Great Springs Waters of Am., Inc., 1 S.W.3d 75 (Tex. 1999); Drinkwine v. State, 300 A.2d 616 (Vt. 1973); Langbrook Props., Ltd. v. Surrey County Council, 3 All E.R. 1424 (Ch. 1969). *See also* Murphy, *supra* note 196, §§ 21.04–.05; Gary Linn Evans, Comment, *Texas Landowners Strike Water—Surface Estate Remediation and Legislatively Enhanced Liability in the Oil Patch—A Proposal for Optimum Protection of Groundwater Resources from Oil and Gas Exploration and Production in Texas*, 37 S. TEX. L. REV. 477 (1996); Stephanie E. Hayes Lusk, Comment, *Texas Groundwater: Reconciling the Rule of Capture with Environmental and Community Demands*, 30 ST. MARY'S L.J. 305 (1998).

205. Act of June 1, No. 1010, 1997 Tex. Gen. Laws 3610. *See also* C. Richard Bath, *A Commentary on Texas Water Law and Policy*, 39 NAT. RESOURCES J. 121 (1999).

reasonable use theory of groundwater rights or a correlative rights theory of groundwater ownership, while legislatures in other states have applied either appropriate rights or regulated riparianism to those waters.[206] Moving away from absolute ownership is actually fairly easy because the predicate for the rule—the impossibility of knowing how groundwater behaves—is no longer true. Still, acquiring that information can involve considerable time and expense.[207]

New Hampshire applied the rule of reasonable use to groundwater in the middle of the nineteenth century,[208] but other states initially rejected that approach in favor of the absolute ownership rule.[209] In recent decades, a large number of states have embraced the reasonable use rule for groundwater in a process that continues to this day.[210] The rule is essentially the same as the reasonable use rule applied to surface water.[211] By this rule, each landowner is free to make any use of the groundwater underlying the land so long as the use is on land overlying the aquifer and the use does not cause unreasonable injury to other lawful users.[212]

Unfortunately the rule of reasonable use does little to prevent the tragedy of the commons for the same reasons it fails to prevent such a tragedy for surface water.[213] Thus we have witnessed the wholesale abandonment of riparian rights in favor of regulated riparianism in eastern states, regarding both surface water and groundwater. This problem has been dramatically demonstrated in a western state—Arizona.[214] Once again, a system of fully

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206. Murphy, *supra* note 191, § 20.04.

207. *See supra* note 199.

208. Bassett v. Salisbury Mfg. Co., 28 N.H. 438 (1854). *See generally* Earl Finbar Murphy, *Reasonable Use Rule*, *in* 3 WATERS AND WATER RIGHTS, *supra* note 1, § 23.01.

209. Murphy, *supra* note 208, § 23.01(c).

210. *See, e.g.*, Martin v. City of Linden, 667 So. 2d 732 (Ala. 1995); Bristor v. Cheatham, 255 P.2d 173 (Ariz. 1953); Stidham v. Algonquin Lake Ass'n, 348 N.W.2d 46 (Mich. Ct. App. 1984); Higday v. Nickolaus, 469 S.W.2d 859 (Mo. Ct. App. 1971); Cline v. Am. Aggregates Corp., 474 N.E.2d 324 (Ohio 1984); Rauthrauff v. Sinking Spring Water Co., 14 A.2d 87 (Pa. 1940); State v. Michels Pipeline Constr., Inc., 217 N.W.2d 339 (Wis. 1974). *See generally* Murphy, *supra* note 208, § 23.02.

211. *Higday*, 469 S.W.2d at 869–70; *Michels Pipeline, Inc.*, 217 N.W.2d at 345–46.

212. *See, e.g.*, Ripka v. Wansing, 589 S.W.2d 333 (Mo. Ct. App. 1979); *Higday*, 469 S.W.2d at 870–72; Nolte v. Michels Pipeline Constr., Inc., 265 N.W.2d 482, 486–87 (Wis. 1978). *See generally* Freyfogle, *supra* note 50, at 506–09. Some courts and commentators used the term "correlative rights" to mean the reasonable use rule as defined here. *See, e.g.*, Woodsum v. Pemberton Township, 412 A.2d 1064 (N.J. Super. Ct. Law Div. 1980), *aff'd on other grounds*, 427 A.2d 615 (N.J. Super. Ct. App. Div. 1981); Davis, *supra* note 138, at 441 n.49.

213. *See supra* text accompanying notes 5–10.

214. *See* Desmond Connell, *A History of the Arizona Groundwater Management Act*, 1982 ARIZ. ST. L.J. 313; Robert Jerome Glennon, *"Because That's Where the Water Is": Retiring Current Users To Achieve the Safe-Yield Objective of the Arizona Groundwater Management Act*, 33 ARIZ. L. REV. 89 (1991).

individual decision-making with no effective mechanism for resolving disputes sets up a race to pump, particularly if well owners anticipate a shift to a legal system that allocates groundwater in proportion to the amount used on a particular date.[215]

Other courts have opted for an approach known as "correlative rights."[216] The correlative rights rule allows unlimited pumping until there is an overdraft on the aquifer. When the water table begins to fall precipitously, a court or administrative agency is called upon to determine the safe yield of the aquifer and then to allocate that amount of water strictly among overlying landowners according to a mathematical formula. Some courts, in disputes among farmers or ranchers, have allocated water according to the amount of land each one owns.[217] That remedy will not work if other significant users are involved. In such cases, the safe yield has been allocated according to the amount of water being pumped during some selected period of time.[218] This last possibility leads back to a race to pump and the tragedy of the commons. In any event, more than a few courts and legislatures have considered the correlative rights approach unworkable because of the large amounts of information it requires (just what really is the safe yield and how much water has been pumped from which wells) and because of the complex requirements for an effective on-going administration of the system.[219]

Legislatures in many, but not all, of the western states have enacted statutes creating appropriative rights systems for the state's groundwater.[220]

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215. *See, e.g.*, State *ex rel.* Morrison v. Anway, 349 P.2d 774 (Ariz. 1960); Vance v. Lassen, 310 P.2d 510 (Ariz. 1957); Southwest Eng'g Co. v. Ernst, 291 P.2d 764 (Ariz. 1955). *See also* City of L.A. v. City of San Fernando, 537 P.2d 1250, 1299 (Cal. 1975) (describing a "race to the pumphouse"). *See generally* Robert Emmett Clark, *Ground Water Management: Law and Local Response*, 6 ARIZ. L. REV. 178 (1965); Dean Mann, *Law and Politics of Groundwater in Arizona*, 2 ARIZ. L. REV. 241 (1960); Murphy, *supra* note 208, § 23.03(c); Michael Mallery, Comment, *Groundwater: A Call for a Comprehensive Management Program*, 14 PAC. L.J. 1279 (1983).

216. *See, e.g.*, City of Barstow v. Mojave Water Agency, 5 P.3d 853 (Cal. 2000); Prather v. Eisenmann, 261 N.W.2d 766 (Neb. 1978). *See generally* Eric Garner & Steven Anderson, *The California Supreme Court Reviews the Mojave River Adjudication*, 2 U. DENV. WATER L. REV. 26 (1998); Earl Finbar Murphy, *The Status of the Correlative Rights Doctrine in Groundwater Today*, *in* 3 WATERS AND WATER RIGHTS, *supra* note 1, ch. 22. Some courts and commentators used the term "correlative rights" to mean the reasonable use rule. *See, e.g.*, *Woodsum*, 412 A.2d at 1064; Davis, *supra* note 138, at 441 n.49.

217. *See, e.g.*, Jones v. Oz-Ark-Val Poultry Co., 228 Ark. 76, 306 S.W.2d 111 (1957); *Prather*, 261 N.W.2d at 766. *See generally* Frank Trelease, *Legal Solutions to Groundwater Problems—A General Overview*, 11 PAC. L.J. 863, 868–69 (1980).

218. *See, e.g.*, Lingo v. City of Jacksonville, 258 Ark. 63, 522 S.W.2d 403 (1975).

219. *See* Higday v. Nickolaus, 469 S.W.2d 859, 866–67 (Mo. Ct. App. 1971) (rejecting the correlative rights rule on grounds of excessive complexity).

220. *See generally* Earl Finbar Murphy, *Groundwater Law and the Appropriative Doctrine*, *in* 3 WATERS AND WATER RIGHTS, *supra* note 1, ch. 24.

These statutes operate much like appropriative rights systems for surface waters, with the same sort of problems. In most states, the appropriation systems for surface waters and groundwater have been kept separate, unless the groundwater is treated as subflow of the surface water source.[221] This has produced a complex scheme in which some aquifer waters are subject to surface priorities and to groundwater priorities, and some aquifer waters are subject only to groundwater priorities.[222] Where surface water and groundwater priorities are unified (whether because the state applies the same statutory scheme to both sorts of water or because the groundwater is tributary to the surface water), groundwater users generally are subordinated to surface users because most people make use of surface water first if it is available.[223] The rigidities of this approach simply do not allow consideration of the relative efficiencies that could arise from a balanced approach to selecting a source of water for particular purposes or at particular places.

Finally, many of the eastern states (and Hawaii) have applied their regulated riparian statutes to groundwater as well as to surface waters.[224] Several other regulated riparian states have applied separate regulatory statutes to groundwater and to surface water, although such separate statutes involve application of the same legal principles.[225] Furthermore, several states—including Arizona, which follows pure appropriative rights for surface waters—have enacted regulated riparian statutes that apply only to

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221. Kansas v. Colorado, 533 U.S. 1 (2001); City of Barstow v. Mojave Water Agency, 5 P.3d 853 (Cal. 2000); Salt Lake City v. Silver Fork Pipeline Corp., 5 P.3d 1206 (Utah 2000); Postema v. Pollution Control Hearings Bd., 11 P.3d 726, 733–41 (Wash. 2000); Hubbard v. State, 936 P.2d 27 (Wash. Ct. App. 1997). *See generally* Bouwer & Maddock, *supra* note 189; Garner & Anderson, *supra* note 216; Katz et al., *supra* note 189; Sperling & Brown, *supra* note 190; Rebecca Sugarman, Comment, *The Mohave Basin Physical Solution: It's a Good Idea, But Is It Good Law?*, 6 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 307 (2000).

222. *See, e.g.*, *In re* Gen. Adjudication of All Rights To Use Water on the Gila River Sys. & Source, 9 P.3d 1069 (Ariz. 2000); *In re* Application of Park County Sportsmen's Ranch LLP, 986 P.2d 262 (Colo. 1999); Chatfield E. Well Co. v. Chatfield E. Prop. Owners Ass'n, 956 P.2d 1260 (Colo. 1998); Cent. Platte Natural Res. Dist. v. Wyoming, 513 N.W.2d 847 (Neb. 1994); Rettkowski v. Dep't of Ecology, 858 P.2d 232 (Wash. 1993).

223. *See* Murphy, *supra* note 220, § 24.01(b).

224. *See* ALA. CODE § 9-10B-3(3), (19) (LEXIS Repl. 2001); CONN. GEN. STAT. §§ 22a-367(9), -368 (1995); DEL. CODE ANN. tit. 7, §§ 6003(a)(3), (b)(4) (2001); FLA. STAT. ANN. §§ 373.019(17), .023(1) (West 2000); HAW. REV. STAT. §§ 174C-3, -4(a) (1993); IOWA CODE ANN. §§ 455B.264(1), .268(1)(a) (West 1997); KY. REV. STAT. ANN. §§ 151.120(1), .150(2) (LEXIS 2001); MD. CODE ANN., ENVIR. §§ 5-101(j)(1), -501(a), -502(a) (1996); MASS. GEN. LAWS ch. 21G, §§ 2, 7 (1994); MINN. STAT. ANN. §§ 103G.005(17), .271(1) (West 1997 & Supp. 2002); MISS. CODE ANN. §§ 51-3-1, 51-3-5 (1999); N.J. STAT. ANN. § 58:1A-3(g) (West 1992); N.C. GEN. STAT. § 143-215.21(3), (5) (2001). *See generally* Dellapenna, *supra* note 10, § 9.03(a)(1).

225. ARK. CODE ANN. § 15-22-302 (LEXIS Repl. 2000); GA. CODE ANN. §§ 12-5-90 to -107 (2001); N.Y. ENVTL. CONSERV. LAW § 15-527 (McKinney 1997) (applying to Long Island counties only); VA. CODE ANN. §§ 62.1-254 to -270 (LEXIS 2001).

groundwater.[226] These statutes regarding groundwater have similar features and operate with similar strengths and weaknesses as do regulated riparian statutes addressed to surface waters.[227]

VI. THE SOUTHEASTERN STATES AT THE OPENING OF THE TWENTY-FIRST CENTURY

I am using the term "southeastern states" to describe the seven states of the deep Confederacy (excepting Texas)—Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, and South Carolina. Except for Louisiana, all of these states adhered to the common law and its tradition of riparian rights. Louisiana's law is based upon the civil law tradition, but its law of water allocation is very similar to riparian rights.[228] Space does not allow a detailed examination of each of these states. Instead, I briefly summarize the law in each state, placing it in the broad picture I have delineated above regarding the evolution of the law of water allocation generally.[229]

A. Alabama

Until quite recently, Alabama followed the reasonable use rule of riparian rights and the absolute ownership rule for groundwater.[230] Alabama's courts evaded the worst effects of the absolute ownership rule by applying nuisance law, rather than groundwater law, to cases where someone, typically in order to work a mine, dewaters an aquifer without using the wa-

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226. ARIZ. REV. STAT. ANN. §§ 45-401 to -655 (West 1994); 525 ILL. COMP. STAT. ANN. §§ 45/1–45/7 (West 1993 & Supp. 2002); IND. CODE §§ 14-25-4-1 to -4-21 (1998); S.C. CODE ANN. §§ 49-5-10 to -150 (Law. Co-op. 1987). *See generally* Clark, *supra* note 215; Mann, *supra* note 215.

227. *See supra* text accompanying notes 111–87.

228. Dellapenna, *supra* note 52, § 10.02(a). I have excluded Texas because it has a rather different legal tradition relating to water allocation, mixing elements of Spanish-Mexican law with common-law riparian rights and a strong dose of appropriative rights. Dellapenna, *supra* note 1, § 8.02(c) nn.200–22. Thus, its legal characteristics are so different that examining its law of water allocation would be of little help in understanding the situation in what I am calling the southeastern states.

229. I do not discuss issues of water pollution or certain specialized questions of water allocation, such as federal reserved rights or the rights of Indian tribes to water. These specialized questions of water allocation are important, but thus far they have little figured in the southeastern states. *See* Dellapenna, *supra* note 10, § 9.06(b)(2).

230. Corona Coal Co. v. Thomas, 101 So. 673, 675 (Ala. 1924) (groundwater); Ulbricht v. Eufaula Water Co., 6 So. 78, 79 (Ala. 1889) (surface water). *See generally* William L. Andreen, *Alabama*, *in* 6 WATERS AND WATER RIGHTS, *supra* note 1, at 185–89; Cox, *supra* note 137; Murphy, *supra* note 216, § 22.06(d)(1) (concluding that Alabama follows the correlative rights rule); Larry O'Neil Putt, *An Analysis and Evaluation of Water Rights in Alabama in Perspective with Other States in the South Atlantic and Gulf Region*, 12 CUMB. L. REV. 47, 59–64 (1981).

ter.[231] In 1989 the Alabama Supreme Court in *Adams v. Long*[232] indicated that it was applying the reasonable use rule for groundwater when it declined to enjoin a farmer who dewatered an aquifer in order to maintain a catfish pond despite the diminution of the flow of an artesian well on neighboring land. While the court stated that it was using the reasonable use theory, in fact it seems to have applied the absolute ownership rule. The court indicated that because the water was withdrawn for a beneficial use on the overlying land, the defendant was not liable for any injury to neighboring landowners.[233] The court made no attempt to balance the several uses against each other to determine the comparative reasonableness of the two uses—something that is at the heart of reasonable use doctrine. Such balancing, apparently, would be done only through the application of nuisance theory when the aquifer was dewatered for some other reason than making a beneficial use of the water on the overlying land.[234]

The Alabama Supreme Court revisited this question in *Martin v. City of Linden*[235] some six years after deciding *Adams*, but did nothing to clarify the matter. The court held then that the city's proposed well field, designed to allow the export of 500,000 gallons per day for use in the city, was unreasonable per se because the water would not be used on the overlying land.[236] Perhaps the court simply sought to avoid the complexities of applying the reasonable use or the correlative rights rule by adopting a rule that basically allows the biggest and most powerful pump to win. It does so, however, through fostering the tragedy of the commons for both surface water and groundwater.

Prompted by three major droughts in the 1980s and a severe dispute with Georgia over transboundary rivers, the Alabama legislature enacted the Alabama Water Resources Act in 1993.[237] The Act declares that the welfare

231. Henderson v. Wade Sand & Gravel Co., 388 So. 2d 900 (Ala. 1980).

232. 553 So. 2d 89 (Ala. 1989).

233. *Id.* at 91–92.

234. *See* City of Mobile v. Lester, 804 So. 2d 220 (Ala. Civ. App. 2001) (applying nuisance theory to damage to homes caused by the city's dewatering of an aquifer through repairs to a street). *See also* Peters v. Amoco Oil Co., 57 F. Supp. 2d 1268 (M.D. Ala. 1999) (applying nuisance theory to pollution from leaking underground storage tanks).

235. 667 So. 2d 732 (Ala. 1995).

236. *Id.* at 736–40. *See also* Ross v. Luton, 456 So. 2d 249 (Ala. 1984). *See generally* Kimberly Till Lisenby, Comment, *Rights to Groundwater in Alabama and the Reasonable Use Doctrine: An Assessment of* Martin v. City of Linden, 48 ALA. L. REV. 1045 (1997).

237. ALA. CODE §§ 9-10B-1 to -30 (2001). *See generally* Andreen, *supra* note 230, at 190–91. On the importance of the interstate disputes, see ALA. CODE §§ 9-10B-5(5)–(6), (14), -6; Cox, *supra* note 137, at 153. *See generally* Carl Erhardt, *The Battle over "The Hooch": The Federal-Interstate Water Compact and the Resolution of Rights in the Chattahoochee River*, 11 STAN. ENVTL. L.J. 200 (1992); David Lewis Feldman, *Southeastern Water Conflicts: Can a Stakeholder Forum Enhance Long-Term Planning?*, 7 RIVERS 191 (2000); C. Grady Moore, *Water Wars: Interstate Water Allocation in the Southeast*, 14 NAT.

of the state depends on "the dedication of the water resources of the State of Alabama to beneficial use to the fullest extent to which they are capable through the development and implementation of plans and programs to manage such quantitative water resources."[238] Beneficial use is defined as "[t]he diversion, withdrawal, or consumption of the waters of the state in such quantity as is necessary for economic and efficient utilization consistent with the interests of this state."[239] The Act does not protect minimum flows in surface sources or minimum levels of groundwater. This approach presumably reflects fears that less than complete development of the state's waters will leave those waters subject to claims in neighboring states.

By this Act, Alabama appeared to join the move to regulated riparianism. The Act establishes and specifies the powers and duties of the Office of Water Resources ("Office") as a division of the Department of Economic and Community Affairs.[240] The Office is charged with developing long-term strategic plans and policies for the use of state waters.[241] The Office, through the Alabama Water Resources Commission ("Commission"), can promulgate rules and regulations and "implement quantitative water resource programs and projects for the coordination, conservation, development, management, use, and understanding of the waters of the state."[242] The Office serves as the repository for the state's water data.[243] It is authorized to cooperate with other state or federal agencies, and has the power to negotiate interstate compacts.[244] In general, the Office is "to monitor, coordinate, and manage the waters of the state" as set out in the Act.[245]

The Act also establishes the Commission as a nineteen member body of political appointees.[246] The Commission is charged with advising the governor and the legislature concerning water related matters.[247] The Commission also provides guidance to the Office and advises it on the formula-

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RESOURCES & ENV'T 5 (1999); Jeffrey Uhlman Beaverstock, Comment, *Learning To Get Along: Alabama, Georgia, Florida and the Chattahoochee River Compact*, 49 ALA. L. REV. 993 (1998); David Copas, Jr., Note, *The Southeastern Water Compact, Panacea or Pandora's Box? A Law and Economics Analysis of the Viability of Interstate Water Compacts*, 21 WM. & MARY ENVTL. L. & POL'Y REV. 697 (1997); Mary R. Hawk, Legislative Review, 14 GA. ST. U. L. REV. 47 (1997); Robert E. Vest, Note, *Water Wars in the Southeast: Alabama, Florida, and Georgia Square Off over the Apalachicola-Chattahoochee-Flint River Basin*, 9 GA. ST. U. L. REV. 689 (1993).

238. ALA. CODE § 9-10B-2(4) (LEXIS Repl. 2001).
239. *Id.* § 9-10B-3(2).
240. *Id.* §§ 9-10B-2(5), -3(13), -4.
241. *Id.* § 9-10B-5(1), (13)–(14).
242. *Id.* § 9-10B-5(3).
243. *Id.* § 9-10B-5(4).
244. ALA. CODE §§ 9-10B-5(5), -5(7), -5(10), -5(20), -6 (LEXIS Repl. 2001).
245. *Id.* § 9-10B-5(12). *See also id.* § 9-10B-5(3).
246. *Id.* §§ 9-10B-12 to -13.
247. *Id.* § 9-10B-16(1).

tion and implementation "of policies, plans, and programs."[248] The Commission has the power to establish and adopt rules or regulations and to hear and determine administrative appeals of the Office.[249]

The Act creates a simple registration and reporting requirement.[250] It requires certain users of water, including both surface water and groundwater, to file a Declaration of Beneficial Use with the Office.[251] The entities required to file such a declaration include:

(1) public water systems;[252]
(2) persons who divert, withdraw, or consume more than 100,000 gallons from the waters of the state on any day;[253]
(3) and persons who have an irrigation system with a capacity to withdraw 100,000 gallons per day from the waters of the state.[254]

The Declaration must

(1) set forth the source of the water;
(2) state the estimated quantity used on an annualized daily basis;
(3) estimate the quantity of water withdrawn or consumed on any given day; and
(4) provide the facts indicating the actual or proposed use is "beneficial."[255]

If the Declaration of Beneficial Use is complete, the Office must issue a Certificate of Use conditioned on the submission of annual reports of the amount of water diverted, withdrawn, or consumed on a monthly basis.[256] The Office makes no determination of the reasonableness or lawfulness of the use. The only real limitation on the Office's obligation to issue the Certificate of Use is that the Office is not to issue it unless the office determines that the proposed use does not interfere with "any presently known existing legal use."[257] How one is to square this requirement with the Act's declaration that "nothing" in the Act supercedes the common-law riparian rights of "existing or future riparian owners concerning the use of the waters of the

248. *Id.* § 9-10B-16(2), (3), (5).
249. *Id.* §§ 9-10B-16(4), -16(6), -18.
250. ALA. CODE §§ 9-10B-19 to -20 (LEXIS Repl. 2001). *See* Cox, *supra* note 137, at 154–55.
251. ALA. CODE § 9-10B-20 (LEXIS Repl. 2001). *See also id.* § 9-10B-3(8) (defining "Declaration of Beneficial Use").
252. *Id.* §§ 9-10B-3(15), -20(a)–(b).
253. *Id.* § 9-10B-20(a).
254. *Id.* § 9-10B-20(d).
255. *Id.* § 9-10B-3(8).
256. ALA. CODE §§ 9-10B-3(4) (defining "Certificate of Use"), -19, -20(e), -20(f), -22 (LEXIS Repl. 2001).
257. *Id.* § 9-10B-20(e). *See* Cox, *supra* note 137, at 154–55.

state" is not clear.[258] Persons who fail to submit a Declaration of Beneficial Use or who make a false statement are subject to administrative or civil enforcement actions brought by the Office.[259]

The Office is authorized to conduct a "critical use study" to determine whether particular areas of the state should be declared to be "capacity stress areas" in which the available water is less than the existing or foreseeable future demand for water.[260] If the Commission determines that the implementation of restrictions on water use are necessary in a capacity stress area, the Commission shall issue a rule designating the capacity stress area and establishing "appropriate conditions or limitations" for all Certificates of Use within the area.[261] No organ of the state has the power to restrict quantitatively any person's use of water except through such conditions or limitations within a capacity use area.[262]

The Act does provide some guidance on priorities to be followed in establishing conditions and limitations in capacity stress areas. It declares that "[t]he use of waters of the state for human consumption is recognized as a priority use of the state and . . . no limitation upon the use of water for human consumption shall be imposed except in emergency situations after the Office has considered all feasible alternatives to such limitations."[263] Unusually, the statute contains no explicit preference for agricultural uses. The Act also includes the following priority scheme for impoundments of water that could indirectly serve that purpose:

(1) all impoundments entirely on the impounder's property when incidental to a use "acknowledged in a certificate of use";
(2) "waste water treatment ponds" or impoundments, including RCRA[264] actions; and
(3) instream uses, including hydropower generation, navigation, recreation, and water oxygenation.[265]

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258. *Id.* § 9-10B-27 (LEXIS Repl. 2001). The statute also requires that Certificates of Use include the following: "THE ISSUANCE OF THIS CERTIFICATE OF USE SHALL NOT CONFER OR MODIFY ANY PERMANENT INTERESTS OR RIGHTS IN THE HOLDER THEREOF TO THE CONTINUED USE OF THE WATERS OF THE STATE OF ALABAMA." *Id.* § 9-10B-20(e).

259. *Id.* § 9-10B-5(18), (19).

260. *Id.* §§ 9-10B-3(3) (defining a "capacity stress area"), -3(7) (defining a "critical use study"), -21, -25 (LEXIS Repl. 2001).

261. ALA. CODE §§ 9-10B-2(6)(a), -22 (LEXIS Repl. 2001).

262. *Id.* § 9-10B-2(6).

263. *Id.* § 9-10B-2(2). On priorities generally, see Dellapenna, *supra* note 10, § 9.03(a)(3).

264. RCRA refers to the Resource Conservation and Recovery Act found at 42 U.S.C. §§ 6901–6908 (2000).

265. ALA. CODE §§ 9-10B-2(7), -20 (LEXIS Repl. 2001).

In adopting restrictions on water use in capacity stress areas, the Commission is charged only to consider impacts on "the uses of water under each certificate of use within such area" along with other relevant factors not including temporal priority.[266] Within the foregoing constraints, the Commission is largely free to exercise its discretion in devising such conditions and limitations as it deems appropriate.[267] Nothing in the statutory scheme explicitly requires the Commission to consider the plans adopted pursuant to the statutory scheme.[268] The Commission must review and if necessary revise its conditions and limitations every twelve months.[269] The Commission may also issue rules to initiate additional conservation measures and to authorize various water resource projects.[270] The Commission can also issue rules allowing the transfer of Certificates of Use on such terms as it determines.[271] Enforcement of the conditions or limitations on Certificates of Use is to be by the Department of Environmental Management, rather than by the Office.[272]

Despite all of this, the statute is a very incomplete form of a regulated riparian statute that places very few restrictions on common law rights and leaves far more questions unresolved than resolved. The Commission has not established any capacity stress areas, meaning that the elaborate regulatory machinery has no effect on actual water use within Alabama. Water users of the state are left to litigate under the common law should they suffer injury from the actions of their neighbors.[273]

B. Arkansas

Arkansas's water allocation law is similar to Alabama's. Arkansas follows the reasonable use version of riparian rights, having given us the paradigm case for that approach in 1955—*Harris v. Brooks*.[274] The Arkansas Supreme Court also embraced the reasonable use approach to groundwater in 1957.[275] Unlike Alabama,[276] however, this appears to be the true form of

266. *Id.* § 9-10B-22(b).

267. *Id.* § 9-10B-22(b)–(c). *See* Cox, *supra* note 137, at 154–57.

268. *See* ALA. CODE § 9-10B-5(1), (13)–(14) (LEXIS Repl. 2001).

269. *Id.* § 9-10B-22(c). *See* Cox, *supra* note 137, at 156–57.

270. ALA. CODE § 9-10B-21 (LEXIS Repl. 2001).

271. *Id.* § 9-10B-19(1) (LEXIS Repl. 2001).

272. *Id.* §§ 9-10B-2(6)(b), -23. The Office, however, is the agency that assesses civil penalties for violations of the Act. *Id.* § 9-10B-5(19).

273. *Id.* §§ 9-10B-20(e), -27.

274. 225 Ark. 436, 283 S.W.2d 129 (1955). *See supra* text accompanying notes 18–38. *See also* Harrell v. City of Conway, 224 Ark. 100, 271 S.W.2d 924 (1954). *See generally* Phillip E. Norvell, *Arkansas*, *in* 6 WATERS AND WATER RIGHTS, *supra* note 1, at 227–30.

275. Jones v. Oz-Ark-Val Poultry Co., 228 Ark. 76, 306 S.W.2d 111 (1957). *See generally* Murphy, *supra* note 216, § 22.05(a) (calling the Arkansas approach "correlative rights").

the doctrine in which competing uses are balanced against each other to determine the specific allocation to each user.[277] Furthermore, Arkansas allows the export of water for use off the overlying land if there is no injury to the water uses of the owners of land overlying the aquifer.[278]

Several decades ago, Arkansas began to experience the entirely predictable problems inherent in the common law reasonable use approach to water management.[279] In particular, leaving to the owner of each lawful well the individual determination of whether, when, and how to use water led to a tragedy of the commons, with widespread overdrafts of aquifers leading to the drying of wells, subsidence of the land, and even salt water intrusion as ever bigger cones of depression spread across the state.[280]

Arkansas has also enacted a limited regulated riparian system. The earliest such scheme was adopted in Arkansas in 1957 when the legislature directed the Soil and Water Conservation Commission ("Commission") to allocate water during times of shortage.[281] This system was reformed by amendments in 1969 and by the Act for Determination of Water Use Requirements in 1985.[282] Finally, in 1991 the legislature enacted the Arkansas Groundwater Protection and Management Act.[283]

The Arkansas statutory scheme generally requires permits only for the building of a dam and for the diversion of "excess surface water."[284] The latter refers to proposals for interbasin diversions or transfers to nonriparians. To determine the extent of excess surface water, the Commission is required to inventory surface water sources, to determine the water needs for various purposes, and to establish minimum streamflows.[285] The Commission can only declare that there is excess surface water if it finds a water surplus over "the foreseeable economic development needs" of the basin of origin.[286] Even then, the Commission can only allocate water for such trans-

276. *See supra* text accompanying notes 232–38.

277. *See* Norvell, *supra* note 274, at 234–36.

278. Lingo v. City of Jacksonville, 258 Ark. 63, 522 S.W.2d 403 (1975).

279. *See supra* text accompanying notes 39–48.

280. *See generally* Looney, *Update*, *supra* note 185, at 622; Norvell, *supra* note 274, at 236.

281. ARK. CODE ANN. §§ 15-22-201 to -220 (LEXIS Repl. 2000).

282. *Id.* §§ 15-22-301 to -304. *See generally* Looney, *Update*, *supra* note 185; Looney, *Modification*, *supra* note 185; Norvell, *supra* note 274, at 230–34; Trelease, *supra* note 139, at 369.

283. ARK. CODE ANN. §§ 15-22-901 to -914 (LEXIS Repl. 2000 & Supp. 2001). *See generally* J.W. Looney, *Enhancing the Role of Water Districts in Groundwater Management and Surface Water Utilization in Arkansas*, 48 ARK. L. REV. 643 (1995); Norvell, *supra* note 274, at 236–40.

284. ARK. CODE ANN. §§ 15-22-205(a)(1), -210 to -214, -216 (dams), -304 (surplus water). *See generally* Norvell, *supra* note 274, at 230–31.

285. ARK. CODE ANN. § 15-22-301 (LEXIS Repl. 2000).

286. *Id.* § 15-22-301(13)–(14).

fers up to twenty-five percent (calculated annually) of the amount of water available in excess of the needs of all riparian users, the requirements of federal water projects, and the firm yield of all relevant reservoirs in existence on June 28, 1985, as well as the needs for minimum streamflows, aquifer recharge, and projected in-basin demand.[287] Finally, the Commission cannot authorize interbasin transfers or use within the basin on non-riparian land unless the Commission finds that the proposed use is "reasonable."[288] The Commission can also condition the permit on the transferee providing water to other water uses within the vicinity of the transportation system at a charge equal to the cost of transportation.[289]

All users of water, whether from surface or subterranean sources, other than those who use excess surface water or water impounded behind a dam are merely required to register their uses of water with the Commission.[290] Upon registration, such water users are issued a Certificate of Registration that amounts to an automatic permit without any evaluation of the reasonableness of the use being made.[291] This procedure is so simple, with only a requirement of the filing of a report that there has been no change from the previous year's pattern of use after the initial registration,[292] that the annual registration requirement would not appear to be a serious impediment to investment.

If the Commission determines that a water shortage exists, Arkansas subjects all surface water users within the region suffering from the shortage to an apparently complete system of regulation.[293] The Arkansas statutory scheme largely cuts off unregistered uses of water from participating in the allocation process.[294] In addressing water shortages, the Commission must follow a priority scheme that was first enacted in 1957 and was substantially modified in 1989 with the addition of three rather specific priorities ahead of the original three general priorities.[295] The result is a somewhat overlapping hodgepodge of priorities:

(1) domestic and municipal domestic supplies;[296]
(2) minimum streamflows;[297]

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287. *Id.* § 15-22-304(b).
288. *Id.* § 15-22-304(c).
289. *Id.* § 15-22-304(d).
290. *Id.* §§ 15-22-215, -302. *See generally* Norvell, *supra* note 274, at 231–33.
291. *See* ARK. CODE ANN. § 15-22-215(e) (LEXIS Repl. 2000).
292. *Id.* § 15-22-215(d).
293. *Id.* §§ 15-22-205(a)(3), -217 (LEXIS Repl. 2000).
294. *Id.* § 15-22-215(f). *See also* Looney, *Update*, *supra* note 185, at 597–98.
295. *See generally* Dellapenna, *supra* note 10, § 9.03(a)(3).
296. ARK. CODE ANN. § 15-22-217(e)(1) (LEXIS Repl. 2000). "Domestic use" is defined as "use of water for ordinary household purposes." *Id.* §§ 15-22-202(5), -903(8) (LEXIS Repl. 2000 & Supp. 2001).

(3) "federal water rights";[298]
(4) the sustaining of life;[299]
(5) the maintenance of health;[300] and
(6) the increase of wealth.[301]

Like Alabama, Arkansas does not give any direct preference to agricultural uses.[302]

The Arkansas statute provides the highest priority for "domestic and municipal domestic" uses by indicating that water for those purposes must be reserved before allocating the remaining water to other uses.[303] The statute takes the same approach for minimum streamflows and federal water rights.[304] In the context of the unusual Arkansas regulatory scheme, however, this simply is an allocation mechanism by another name. Furthermore, it is not clear how meaningful this preference actually is. While the preference exempts domestic and municipal uses from the registration obligation, failure to register arguably cuts off the right to take water for domestic or municipal uses relative to registered riparian uses.[305] Read in this fashion, the exemption from registration would benefit domestic users only relative to non-riparian uses. The priority of domestic and municipal uses and of minimum streamflows over federal water rights, however, is highly unlikely to be upheld should it be tested in court.[306] Insofar as the federal authorities (legislative and administrative) choose to follow those priorities themselves, the issue might never be tested.

The Arkansas system for allocating surface water shares most of the other features of the more usual regulated riparian systems, including the authorization (to a limited extent) of non-riparian uses,[307] the protection of public values,[308] and provision for the protection of minimum streamflows.[309] The process of setting minimum flows has proven highly political,

297. *Id.* § 15-22-217(e)(2) (LEXIS Repl. 2000). *See also id.* §§ 15-22-202(6), -222, -301(4), -301(14).
298. *Id.* § 15-22-217(e)(3).
299. *Id.* § 15-22-217(c)(1).
300. *Id.* § 15-22-217(c)(2).
301. *Id.* § 15-22-217(c)(3).
302. *See* ARK. CODE ANN. § 15-22-217(c), (e) (LEXIS Repl. 2000).
303. *Id.* § 15-22-217(d).
304. *Id.* § 15-22-217(e).
305. *See id.* § 15-22-215(f).
306. *See, e.g.*, California v. United States, 438 U.S. 645 (1978); Cappaert v. United States, 426 U.S. 128 (1976). *See also* Robert E. Beck, *Use Preferences for Water*, 76 N. DAK. L. REV. 753, 767–68 (2000).
307. *See* ARK. CODE ANN. § 15-22-304 (LEXIS Repl. 2000).
308. *See id.* § 15-22-217(d), (e).
309. *See id.* §§ 15-22-222, -301(4), -301(14). *See also* P. Douglas Mays et al., *History of Instream Flow Issues in Arkansas*, 1 RIVERS 313 (1990).

however, with considerable pressure brought to bear on the Commission, both from other branches of the state government and from private interests.[310] The result was a considerable modification (and reduction) of the proposed original levels of protection.

The 1991 Groundwater Protection Act ("Protection Act") applies the same approach to groundwater—defined as "water beneath the surface of the ground."[311] The Protection Act requires the Commission to classify groundwater and to handle the "management of groundwater."[312] As with surface water sources, the Protection Act authorizes the Commission to designate critical groundwater areas.[313] After designating the area, the Commission must make a formal determination that it is necessary to impose regulatory controls on withdrawals of groundwater within the critical groundwater area.[314] Thereafter, the Commission will control such withdrawals by issuing "water right[s]."[315]

Even after issuing water rights, the Commission cannot order preexisting wells to reduce pumping unless substitute water is available from an alternative supply at no greater cost than the cost of procuring water from the user's wells,[316] and the Commission cannot order any reduction at all when a well-owner drawing water from an "alluvial aquifer" has reduced pumping by twenty percent or more since 1986 through water conservation measures.[317] The Commission cannot even order a reduction of or limitation on pumping from existing wells or from wells drilled within the first year of the initiation of regulatory authority until four years have passed from that initiation.[318] The Commission is also denied authority to regulate wells pumping less than 50,000 gallons per day, or wells supplying individual households solely for domestic purposes.[319] The Commission is further prohibited from regulating vendors of bottled water and public water supply

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310. *See* Looney, *Update*, *supra* note 185, at 608–13 (describing the minimum streamflows process); Mays et al., *supra* note 309.

311. ARK. CODE ANN. § 15-22-903(9) (LEXIS Supp. 2001).

312. *Id.* § 15-22-906 (LEXIS Repl. 2000 & Supp. 2001). *See generally* Looney, *supra* note 283; Norvell, *supra* note 274, at 236–40.

313. ARK. CODE ANN. §§ 15-22-903(6), -904(1), -908, -909, -914, 26-51-1003(4) (LEXIS Repl. 2000 & Supp. 2001).

314. *Id.* § 15-22-909(a)(2), (3), (5).

315. *Id.* §§ 15-22-903(13), -909(a)(1), -909(a)(4), -910(b), -911 (LEXIS Repl. 2000 & Supp. 2001).

316. *Id.* §§ 15-22-905(1), -910(a) (LEXIS Supp. 2001). On the intricacies of Arkansas law regarding the making of water available from alternative sources, see Looney, *supra* note 283, at 657–708.

317. ARK. CODE ANN. § 15-22-905(2)(A) (LEXIS Supp. 2001). The term "alluvial acquifer" is not defined either in the statute or in case law.

318. *Id.* § 15-22-909(b).

319. *Id.* § 15-22-905(3), (4). *See id.* 15-22-903(8) (defining "domestic use").

systems.[320] Within these rather serious limitations on the Commission's regulatory authority, the Commission is charged to give first preference in issuing water rights to sustaining life, followed by maintaining health, and finally to increasing wealth.[321] There is no reference to the other priorities that apply to surface water sources in the Protection Act.[322]

As with surface water sources, the Commission was slow to declare critical groundwater areas.[323] The Commission has finally done so, but it is too soon to evaluate the effectiveness of the process. And while some might see in the duty to manage the groundwater of the state a rather far-reaching authority to act independently of the rather restrictive standards for regulating critical groundwater areas,[324] the Commission has taken no real steps here. In areas that have not been declared critical groundwater areas or that have a shortage of water in a stream, water users in the state still must resort to traditional riparian rights and reasonable use groundwater law to resolve water allocation problems.[325] On the other hand, because of concern about disrupting the authority of the administering agency, the Arkansas Court of Appeals has construed the Arkansas statute's silence on the matter as making the agency the only forum in which a riparian owner can attack the reasonableness of a competing use, and then only through the hearing on a permit application.[326] This solution is not an entirely satisfactory solution, however, because administering agencies have no authority to "adjudicate private damage claims" or "to provide general equitable relief."[327]

Arkansas law does not support market or other voluntary transfers of the right to use water. The provisions relating to the allocation of surface water make no mention of the possibility of transferring an allocation. The Protection Act does speak to the question, providing that persons withdrawing water under water rights pursuant to it are not allowed to assign a water right apart from a conveyance of the land to which the right is attached.[328]

For surface water sources, Arkansas requires the Commission to give priority to the needs for water within the state,[329] while banning (except for bottled water or municipal systems in operation in 1984) the diversion of water for use outside the state without either the approval of the legislature

320. *Id.* § 15-22-905(6).
321. *Id.* § 15-22-910(c).
322. *See supra* text accompanying notes 295–306.
323. *See* Looney, *supra* note 283, at 654.
324. *Id.* at 654–57.
325. *See, e.g.*, Lingo v. City of Jacksonville, 258 Ark. 63, 522 S.W.2d 403 (1975).
326. Styers v. Johnson, 19 Ark. App. 312, 315–16, 720 S.W.2d 334, 337 (1986).
327. *See, e.g.*, *In re* Buttolph, 527 A.2d 1147, 1148 (Vt. 1987).
328. ARK. CODE ANN. § 15-22-911(g), (h) (LEXIS Repl. 2000).
329. *Id.* § 15-22-303. *See also id.* §15-22-301(14), (15) (providing a similar preference for in-basin uses over interbasin transfers).

or pursuant to an interstate compact.[330] Arkansas modeled this statute on the New Mexico statute that was found to violate the interstate commerce clause in *City of El Paso v. Reynolds*.[331] The relatively greater availability of water in Arkansas compared to New Mexico suggests that the validity of the Arkansas statute is suspect, to say the least.[332]

A registration scheme such as Arkansas's does at least facilitate short- and long-range planning. Comprehensive long-range planning often is the first step that a riparian rights state takes in transforming itself into a regulated riparian state.[333] The Arkansas scheme requires extensive planning by the Commission, particularly regarding possible water emergencies.[334] The Commission is also charged to gather data on water needs and water usage in the state and to make that data available both to government officials and to the public.[335] The situation in Arkansas is rather different from the other states that require emergency plans due to the different structure of the Arkansas regulated riparian scheme.[336] Nor does the regulatory authority to deal with shortages require that the Commission's action be based upon or consistent with the previously prepared plans. One is left to presume that the Commission nonetheless will be guided by its plans in implementing the statutory priorities.[337]

The Arkansas system operates largely on the basis of statewide administration. The Arkansas system does, however, authorize the Commission to delegate its allocation authority to regional conservation districts or regional water districts.[338] The legislature, in fact, expressed a strong preference for regional districts in the management of groundwater, but left the decision in this regard to the Commission.[339] The regional districts are also authorized to perform the ministerial act of receiving the registration of a water use, although the statute is not clear whether this power exists independently of the delegation of authority to allocate.[340]

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330. *Id.* § 15-22-303(d).

331. 563 F. Supp. 379 (D.N.M. 1983), *aff'd on reh'g*, 597 F. Supp. 694 (D.N.M. 1984). *See generally* Richard S. Harnsberger et al., *Interstate Transfers of Water: State Options After* Sporhase, 70 NEB. L. REV. 755, 817–30 (1991).

332. *See* Abrams, *supra* note 91, at 620–21; Looney, *Update*, *supra* note 185, at 613–15, 618–20.

333. *See* Looney, *Update*, *supra* note 185, at 577–80.

334. *See* ARK. CODE ANN. §§ 15-22-220, -301, -503, -504 (LEXIS Repl. 2000).

335. *Id.* §§ 15-22-220, -301.

336. *See* Dellapenna, *supra* note 10, § 9.05(d).

337. *See generally* Looney, *Update*, *supra* note 185, at 591–608.

338. ARK. CODE ANN. §§ 15-22-202(2), -202(4), -202(9), -221, -902, -903(5), -903(7), -903(11), -904(8), -904(10) (LEXIS Repl. 2000 & Supp. 2001). *See* City of Fort Smith v. River Valley Reg'l Water Dist., 344 Ark. 57, 37 S.W.3d 631 (2001).

339. ARK. CODE ANN. §§ 15-22-908, -909 (LEXIS Repl. 2000 & Supp. 2001).

340. *Id.* § 15-22-215(a).

C. Florida

Florida abandoned the common law of riparian rights and the reasonable use approach to groundwater in 1972 with the enactment of the Florida Water Resources Act of 1972 ("Florida Act").[341] The Florida Act declares the policy of the state to control fully the waters of the state in order to "realize their full beneficial use" and to assure their "sustainability."[342] It applies equally to surface water and to groundwater.[343] Unlike Alabama and Arkansas, Florida has applied its regulated riparian scheme so thoroughly that there is no point in considering the old law relative to that state. In fact, the Florida statute is one of the primary models for the regulated riparian system in the United States.[344]

The Florida regulated riparian statute originated in a study by the dean and two law professors at the University of Florida—Frank Maloney, Richard Ausness, and Scott Morris. They published their study under the title of *A Model Water Code*.[345] The core of the Maloney, Ausness, and Morris Model Water Code was adopted virtually verbatim in Florida. The same three professors also drafted the Florida Act, and thus, are responsible for most of the differences between their model code and the Florida Act.[346]

The Florida Act vests the Department of Environmental Protection ("Department") with responsibility for planning and managing the state's waters.[347] The Department also is to serve as a repository for all scientific and factual information generated by local governments, water management districts, and state agencies relating to water resources and, to that end, collect, maintain, and make available such information to public and private users within the state and assist in the acquisition of scientific and factual data from water management districts, local governments, and the United States Geological Survey.[348] As the reference to the United States Geological Survey suggests, the Department is charged to cooperate with federal and local agencies that deal with water.[349] When the Department completed

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341. FLA. STAT. ANN. §§ 373.013–.619 (West 2000 & Supp. 2001). *See generally* Donna R. Christie, *Florida*, *in* 6 WATERS AND WATER RIGHTS, *supra* note 1, at 289; Murphy, *supra* note 216, § 22.06(b).

342. FLA. STAT. ANN. § 373.016(1), (2) (West 2000).

343. *Id.* §§ 373.019(17), .023(1).

344. Dellapenna, *supra* note 10, § 9.03 nn.236–42.

345. MALONEY, AUSNESS, & MORRIS, *supra* note 40.

346. Richard Ausness, *The Influence of the Model Water Code on Water Resources Management Policy in Florida*, 3 J. LAND USE & ENVTL. L. 1 (1987). *See also* MALONEY, AUSNESS, & MORRIS, *supra* note 40, at viii.

347. *See* FLA. STAT. ANN. §§ 373.019(2), .019(5), .026(1), .026(7), .036, .129 (West 2000).

348. *Id.* § 373.026(2), (4).

349. *Id.* §§ 373.026(3), .026(6), .026(8)(b), .026(9), .036, .046, .196 (West 2000 & Supp.

the state water plan, however, it was not accepted by the state legislature and thus, became (at least technically) a dead letter.[350]

The Florida Act has several unique features when compared to other regulated riparian statutes. Florida, alone among regulated riparian states, chose to divide the power and responsibility for administering its regulated riparian statute among five regional water management districts.[351] Florida's legislature decided that these districts correspond to the diverse matches across the state between need and availability of water.[352] The districts are vested with a great deal of the planning responsibility.[353] The districts set the protected minimum flows and levels for the state's water resources.[354] The Department's role is aptly described as a "general supervisory authority."[355]

The legislature left the authority to each of the several water management districts to determine whether to implement the permit requirement of the Florida Act and whether to extend this requirement to groundwater as well as surface water.[356] So diverse are the districts that the two northernmost districts did not implement the permit system until the 1990s, leaving water users in those districts to continue under the common law of riparian rights for twenty years after the adoption of Florida's regulated riparian system.[357] Even after all of the districts were ready to implement the regulated riparian system, wide variations existed in how they implemented it.

2001).

350. Ausness, *supra* note 346, at 23–24. Of course, if the Department or other agencies defer to the plan despite its legislative rejection, it can still carry significant weight in fact.

351. FLA. STAT. ANN. §§ 373.069–.083, .136, .171, .216 (West 2000 & Supp. 2001). *See* Southwest Fla. Water Mgmt. Dist. v. Charlotte County., 774 So. 2d 903 (Fla. Dist. Ct. App. 2001); Southwest Fla. Water Mgmt. Dist. v. Save the Manatee Club, Inc., 773 So. 2d 594 (Fla. Dist. Ct. App. 2000); St. Johns River Water Mgmt. Dist. v. Consol.-Tomoka Land Co., 717 So. 2d 72 (Fla. Dist. Ct. App. 1998), *superceded by statute as stated in* Southwest Fla. Water Mgmt. Dist. v. Save the Manatee Club, Inc., 773 So. 2d 594 (Fla. Dist. Ct. App. 2000). *See also* Christie, *supra* note 341, at 289–90; Joseph Schilling, *Special Forces*, ENVTL. F., Nov.–Dec. 1999, at 30; Martha C. Mann, Note, St. Johns River Water Management District v. Consolidated-Tomoka Land Co.: *Defining Agency Rulemaking Authority Under the 1996 Revisions to the Florida Administrative Procedure Act*, 26 FLA. ST. U. L. REV. 517 (1999). *See generally* Robert Verchick, *Critical Space Theory: Keeping Local Geography in American and European Environmental Law*, 73 TUL. L. REV. 739 (1999).

352. *See generally* FRANK MALONEY ET AL., FLORIDA WATER LAW 1980, at 191–329 (1980).

353. *See* FLA. STAT. ANN. §§ 373.036–.0397, .199, .1995 (West 2000 & Supp. 2001).

354. *Id.* §§ 373.042–.0421 (West 2000).

355. *Id.* § 373.026(7).

356. *Id.* §§ 373.069 to .0695, .103(1), .219(1). Florida's statute also includes elaborate provisions regarding interdistrict transfers of ground water. *Id.* § 373.2295 (West 2000 & Supp. 2001).

357. *Id.* § 373.216 (West 2000). *See also* MALONEY, AUSNESS, & MORRIS, *supra* note 40, at 223–24.

Thus, one empirical study of the Florida permit system found that at least one water district, in order to avoid conflict, routinely granted irrigators' requests for more water than they actually needed.[358]

Except for domestic uses, all water users in the state are required to obtain a permit for their use from the appropriate water management district once the district initiates the permit requirement.[359] Florida provides that permits are to be for twenty years, but for municipalities or governmental bodies the permits can be issued for up to fifty years.[360] Florida adopted as its criterion the concept of "reasonable-beneficial use."[361] Apparently the influential trio of Maloney, Ausness, and Morris believed that if either criterion alone was too vague, together they might somehow synergize to create the elusive objective criterion so dear to those who fear excessive administrative discretion.[362]

Florida's regulated riparian statute defines the term "reasonable-beneficial use" as "the use of water in such quantity as is necessary for economic and efficient utilization for a purpose and in a manner which is both reasonable and consistent with the public interest."[363] Here, "beneficial" appears to mean two things—economic and efficient, which perhaps mean respectively non-wasteful and economically efficient. "Non-wasteful" simply means not using more water than is necessary for the planned use, while "economically efficient" can mean putting water to its most profitable use, taking all costs into account.[364] The Florida legislature provided virtually no guidelines to control the administering agency's discretion in determining what is a reasonable use, except for some exceptionally vague declarations of policy.[365] Even assuming that it is objectively clear which uses qualify as beneficial (an assumption that often will not hold), administering agencies still have considerable discretion to determine whether the manner and purpose of the use are "reasonable" and "consistent with the public interest."[366]

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358. *See* Gary D. Lynne et al., *Water Permitting Behavior Under the 1972 Florida Water Resources Act*, 67 LAND ECON. 340 (1991).

359. FLA. STAT. ANN. § 373.219(1). *See generally* Christie, *supra* note 341, at 290–95.

360. FLA. STAT. ANN. § 373.236 (West 2000).

361. *Id.* § 373.223(1)(a).

362. MALONEY, AUSNESS, & MORRIS, *supra* note 40, § 1.03(4), at 86, § 2.02(1)(a), at 179. *See also* Frank E. Maloney et al., *Florida's "Reasonable Beneficial" Water Use Standard: Have East and West Met?*, 31 U. FLA. L. REV. 253 (1979).

363. FLA. STAT. ANN. § 373.019(4) (West 2000). *See generally* MacDougal, *Private Hopes*, *supra* note 52, at 18.

364. *See* POSNER, *supra* note 79, § 1.2; Phyllis Saarinen & Gary Lynne, *Getting the Most Valuable Water Supply Pie: Economic Efficiency in Florida's Reasonable-Beneficial Use Standard*, 8 J. LAND USE & ENVTL. L. 491 (1993).

365. *See* FLA. STAT. ANN. § 373.016 (West 2000).

366. *See* MacDougal, *Private Hopes*, *supra* note 52, at 45–55.

Florida has certain specific provisions that further extend the discretionary authority of the water districts over water use permits. Florida authorizes the issuances of "general permits" for classes of use having "minimal adverse impact" on water resources.[367] Florida also authorizes temporary permits pending a decision on the application.[368] Additionally, Florida provides for permits to divert "ground or surface water beyond the overlying land, across county boundaries, or outside the watershed from which it is taken."[369]

The Florida Act thus clearly rules out the watershed rule, but it leaves one to infer that the non-riparian use rule is also eliminated by analogy to the elimination of the overlying land rule for groundwater.[370] While no judicial decision in Florida has yet considered this question, in *Osceola County v. St. Johns River Management District*,[371] the Florida Supreme Court did uphold the right of the water management districts to authorize the diversion of water from one district for use in another district.[372] On its face, this result poses no problems relative to interstate commerce, although the statutory system might become problematic if one can prove that the evaluation of the public interest discriminates against out-of-state users. These provisions have been criticized as the weakest part of the Florida regulatory scheme.[373]

The Florida Act, again alone among the regulated riparian statutes that have been enacted over the past forty-five years, addresses explicitly the question of civil liability in favor of a permittee injured by another permittee's violation of the terms or conditions of a permit.[374] The Florida Act creates a problem for a permittee who seeks relief under this provision, however. The right to sue for damages accrues only to "abutting consumptive use permit holders,"[375] as if only abutting permittees could possibly injure one another. Even they cannot sue until they have first applied for and been denied relief by the water management district.[376]

The Florida Act makes no express provision for voluntary transfers. A provision for the voluntary modification of permits seems to address only a modification that does not change the purpose of the use or the identity of

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367. FLA. STAT. ANN. § 373.118 (West 2000).

368. *Id.* § 373.244.

369. *Id.* § 373.223(2).

370. *See also id.* § 373.2295 (West 2000 & Supp. 2001) (interdistrict transfers of groundwater).

371. 504 So. 2d 385 (Fla. 1987).

372. *Id.* at 388.

373. Ronald A. Christaldi, Comment, *Sharing the Cup: A Proposal for the Allocation of Florida's Water Resources*, 23 FLA. ST. U. L. REV. 1063 (1996).

374. FLA. STAT. ANN. § 373.245 (West 2000).

375. *Id.*

376. *Id.*

the user.[377] Once water is fully allocated, a new water user apparently can obtain water only by filing a competing application for a permit when an existing permittee applies for renewal of a permit. While in principle, as between two qualified applicants, the permit should go to the one that best serves the public interest,[378] the Florida Act provides a preference for renewal applications over initial applications—if competing applications "qualify equally" for the permit, an existing permit should be renewed.[379] Of course, the water management district can easily determine that the applications do not qualify equally if the district is so inclined.

Florida authorizes water management districts to curtail water uses during water emergencies.[380] The Florida Act not only requires the districts to prepare emergency plans,[381] but also authorizes the water management districts to impose further restrictions on water users should their plans prove inadequate to the crisis, without regard to any inconsistency with the permits as issued.[382]

Despite the broad discretion given in so many respects to the water management districts, there have not been many legal challenges to the actions of the districts or to the delegation of authority to the districts. In the few cases in which such challenges were brought, Florida's courts generally have been deferential to the decisions made by the districts. Two panels of the Florida appellate court upheld the regulations adopted by a district that were challenged based on improper delegation despite a rather restrictive view of the standards necessary to uphold a delegation in that state.[383] A different Florida panel, however, struck down regulations that the court found were not authorized by the state's regulated riparian statute—a somewhat different question.[384] Riparian users of water have faired no better with claims that their property—riparian rights—was taken because they were assured only an initial permit upon the effective date of the Florida Act,[385] with no assurance that they would be renewed upon the expiration of the first permit some twenty years later.[386] Florida courts rejected such

377. *See id.* § 373.239.

378. *See id.* § 373.233(1).

379. *Id.* § 373.233(2).

380. FLA. STAT. ANN. §§ 373.175, .246 (West 2000).

381. *Id.* § 373.246(1).

382. *See id.* §§ 373.246(7)–(8).

383. Southwest Fla. Water Mgmt. Dist. v. Charlotte County, 774 So. 2d 903, 909 (Fla. Dist. Ct. App. 2001); St. Johns River Water Mgmt. Dist. v. Consol.-Tomoka Land Co., 717 So. 2d 72 (Fla. Dist. Ct. App. 1998), *superceded by statute* FLA. STAT. ANN. § 120.52(8) (West 2000). *See also* Southwest Fla. Water Mgmt. Dist. v. Save the Manatee Club, Inc., 773 So. 2d 594 (Fla. Dist. Ct. App. 2000). *See generally* Mann, *supra* note 351.

384. *Save the Manatee Club, Inc.*, 773 So. 2d at 594.

385. FLA. STAT. ANN. § 373.226 (West 2000).

386. *Id.* § 373.236(1). If the existing user is a municipality, the first permit would not

claims, finding instead that it was a reasonable regulation of the property right.[387]

Finally, unlike Alabama and Arkansas, Florida has a large native American population with claims to water rights derived from federal law rather than Florida law.[388] Florida and the Seminole Tribe have reached a settlement by a compact between the tribe and the state that could serve as a model for such issues in other regulated riparian states.[389] Florida recognized a Seminole's right to a percentage of the water available from specified sources (usually fifteen percent), and the Seminoles agreed to abide by most non-procedural aspects of Florida's regulated riparian statute. The tribe has the exclusive right to regulate Indian water usage, but must provide annual notice of the patterns of use to state authorities. This approach would appear to be based on riparian principles rather than on appropriation principles. In fact, so alien is the approach of this eastern Indian water settlement that a purportedly comprehensive study of Indian water settlements did not even mention the Seminole agreement.[390] This agreement might presage an attempt to market Indian water rights—a development finding increasing support in western states.[391]

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expire for fifty years. *Id.* § 373.236(2).

387. Village of Tequesta v. Jupiter Inlet Corp., 371 So. 2d 663 (Fla.). *See also supra* note 163–64 and accompanying text.

388. *See generally* JON HARE, INDIAN WATER RIGHTS: AN ANALYSIS OF CURRENT AND PENDING WATER RIGHTS SETTLEMENTS (1996); PETER SLY, RESERVED WATER RIGHTS SETTLEMENT MANUAL (1988); Judith V. Royster, *A Primer on Indian Water Rights: More Questions Than Answers*, 30 TULSA L.J. 61 (1994).

389. 25 U.S.C. § 1772e (2000). *See* Royster, *supra* note 388, at 101–02; Royster, *supra* note 137, at 199–200; Jim Shore & Jerry C. Straus, *The Seminole Water Rights Compact and the Seminole Indian Land Claims Settlement Act of 1987*, 6 J. LAND USE & ENVTL. L. 1 (1990); Barbara S. Monahan, Note, *Florida's Seminole Indian Land Claims Agreement: Vehicle for an Innovative Water Rights Compact*, 15 AM. INDIAN L. REV. 341 (1991). Water management districts are explicitly authorized to act consistently with the compact. FLA. STAT. ANN. § 373.200 (West 2000 & Supp. 2001).

390. Elizabeth Checchio & Bonnie G. Colby, *The Context for Indian Water Settlements*, *in* WATER LAW: TRENDS, POLICIES, AND PRACTICES 179 (Kathleen Marion Carr & James Crammond eds., 1995).

391. *See, e.g.*, David H. Getches, *Management and Marketing of Indian Water: From Conflict to Pragmatism*, 58 U. COLO. L. REV. 515 (1988); Jack D. Palma II, *Considerations and Conclusions Concerning the Transferability of Indian Water Rights*, 20 NAT. RESOURCES J. 91 (1980); Karen M. Shapiro, *An Argument for the Marketability of Indian Reserved Water Rights: Tapping the Untapped Reservoir*, 23 IDAHO L. REV. 277 (1987); Christine Lichtenfels, Comment, *Indian Reserved Water Rights: An Argument for the Right to Export and Sell*, 24 LAND & WATER L. REV. 131 (1989); Chris Seldin, Comment, *Interstate Marketing of Indian Water Rights: The Impact of the Commerce Clause*, 87 CAL. L. REV. 1545 (1999); Lee Storey, Comment, *Leasing Indian Water Off the Reservation: A Use Consistent with the Reservation's Purpose*, 76 CAL. L. REV. 180 (1988).

D. Georgia

For more than a century, Georgia was formally committed to what has been described by Justice Harold Hill, Jr., as a version of "the natural flow theory of riparian rights doctrine as modified by a reasonable use provision."[392] This self-contradictory description derives from two Georgia statutes that read together adopt the reasonable use theory while also embracing the natural flow theory.[393] In fact, as is true in all states committed to riparian rights, Georgia courts apply the reasonable use theory rather than the natural flow theory whenever they have to make a choice.[394] Thus, when a landowner allowed beavers to dam a pond, the landowner was held not to be liable for any resulting backflooding on a neighbor's property,[395] but neither would that landowner gain anything in terms of water rights relative to other landowners based upon such beaver impoundments.[396]

Georgia courts generally have followed a standard reasonable-use riparian theory. Thus the right to use water is restricted to those who own riparian land.[397] Such owners are allowed individually to decide when, where, and how to use the water, with the only limitation being that the use must be reasonable relative to a competing user. Georgia generally leaves it to the jury to decide what is reasonable under riparian rights with little or no

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392. Stewart v. Bridges, 292 S.E.2d 702, 704 (Ga. 1982); Pyle v. Gilbert, 265 S.E.2d 584, 587 (Ga. 1980).

393. One section of the Georgia Code provides that: "Running water belongs to the owner of the land on which it runs; but the landowner has no right to divert the water from its usual channel nor may he so use or adulterate it as to interfere with the enjoyment of it by the next owner." GA. CODE ANN. § 44-8-1 (2002). Another section provides that:

> The owner of the land through which nonnavigable watercourses flow is entitled to have the water in such streams come to his land in its natural and usual flow, subject only to such detention or diminution as may be caused by a reasonable use of it by other riparian proprietors. The diverting of the stream in whole or in part from its natural and usual flow, or the obstructing thereof so as to impede its course or cause it to overflow or injure the land through which it flows or any right appurtenant thereto, or the polluting thereof so as to lessen its value to the owner of such land shall constitute a trespass upon the property.

Id. § 51-9-7 (2000).

394. *See generally* James L. Bross, *Georgia*, *in* 6 WATERS AND WATER RIGHTS, *supra* note 1, at 301–04. For an example of a similar confusion in Arkansas, see *Harris v. Brooks*, 225 Ark. 436, 443–44, 283 S.W.2d 129, 133–34 (1955), noting that Arkansas had not yet definitely selected between the two theories, but then choosing the reasonable use theory. *Harris* is analyzed in the text *supra* at notes 18–38.

395. Bracey v. King, 406 S.E.2d 265 (Ga. Ct. App. 1991). Note that in Georgia, as in most states, backflooding without permission is a classic trespass notwithstanding any claim of riparian rights. Rushing v. Akins, 80 S.E.2d 813 (Ga. 1954); Wright v. Lovett, 209 S.E.2d 15 (Ga. Ct. App. 1974).

396. Dawson v. Wade, 361 S.E.2d 181 (Ga. 1987).

397. Moulton v. Bunting McWilliams Post No. 658, 102 S.E.2d 593 (Ga. 1958).

instruction from the court.[398] Municipalities are treated just like private riparians—meaning that their sale of water to users within the city who are not themselves riparian is considered to be a non-riparian use that is per se unreasonable should a riparian owner challenge the municipality's use.[399] The reasonable use theory is also applied to disputes arising from the pollution of surface water.[400]

Georgia courts have remained committed to ignoring temporal priorities in deciding the reasonableness of water usage. Both dimensions of riparian rights in Georgia are illustrated by the leading case of *Pyle v. Gilbert*.[401] *Pyle* involved a dispute between the owners of a 140-year-old gristmill and five irrigating farmers, with at least one farmer having begun to divert water barely three years before the suit began. The Georgia Supreme Court posed the problem before it as a choice "between the past and the present."[402] While the court ordered a new trial to determine whether the irrigation was unreasonable relative to plaintiffs' uses,[403] the court not only saw nothing in the plaintiffs' temporal priority worth commenting on, but also held that a statute barring the diversion of water did not apply to irrigation[404] and overruled a case in which the court had held non-riparian uses to be per se unreasonable.[405] Both rules would have resulted in an easy victory for the plaintiffs.

Justice Harold Hill, Jr., indicated in *Pyle* that the ban on diversion applied only to the diversion of water into another watershed and not to the withdrawal of water for reasonable use within the basin of origin.[406] Barely two years later, the Georgia Supreme Court reaffirmed the irrelevancy of temporal priority in its decision in *Stewart v. Bridges*.[407] *Stewart* concerned a dispute between an irrigating farmer and a group of homeowners who used the lake in question for personal recreation.[408] In both *Pyle* and *Stewart*, the court refused to adopt a rule protecting some judicially prescribed minimum level for the stream or lake and remanded both cases for a full

398. *See, e.g.*, Stewart v. Bridges, 292 S.E.2d 702, 703–04 (Ga. 1982); Price v. High Shoals Mfg. Co., 64 S.E. 87, 90 (Ga. 1909).

399. City of Elberton v. Pearle Cotton Mills, 50 S.E. 977 (Ga. 1905).

400. Superior Farm Mgmt., LLC v. Montgomery, 513 S.E.2d 215 (Ga. 1999) (speaking in terms of "nuisance"); Vickers v. City of Fitzgerald, 117 S.E.2d 316 (Ga. 1960) (same), *overruled on other grounds by* City of Chamblee v. Maxwell, 452 S.E.2d 488 (Ga. 1994); Cairo Pickle Co. v. Muggridge, 55 S.E.2d 562 (Ga. 1949) (based upon riparian rights).

401. 265 S.E.2d 584 (Ga. 1980).

402. *Id.* at 585.

403. *Id.* at 588.

404. *Id.* at 586–87.

405. *Id.* at 588–89 (overruling Hendrix v. Roberts, 165 S.E. 223 (Ga. 1932)).

406. *Id.* at 586–87. *Cf.* McNabb v. Houser, 156 S.E. 595 (Ga. 1931) (applying the ban on diversion to a gold mine).

407. 292 S.E.2d 702 (Ga. 1982).

408. *Id.* at 703.

trial on whether one use was "more reasonable" than the other.[409] In *Pyle*, Justice Hill specifically found it inappropriate to grant a summary judgment based on suppositions about the economic utility of irrigation versus a mill or recreation.[410] Justice Hill, who was by then Presiding Justice, also wrote the opinion in *Stewart*. While Justice Hill's *Stewart* opinion was much shorter and said little about how to balance agriculture against recreation, he again emphasized the need to try the issue contextually on the basis of riparian theory, and not on some *a priori* property theory.[411] In both cases, he refused to intimate to the trial court anything about how the balance ought to be struck, perhaps for fear of treading on the jury's role. The coolness of Georgia's courts to claims of prescriptive rights underlines the irrelevance of temporal priority to riparian rights in Georgia.[412]

In *Pyle*, however, the court did make a limited effort to accommodate the idea of markets to Georgia riparian rights.[413] Apparently all that the buyer in *Pyle* acquired was the right to claim a reasonable use of the common pool resource. Even accepting that the right to make a consumptive use of water is transferable to a non-riparian, *Pyle* left unsettled whether the reasonable needs of the grantor (therefore avoiding possible prejudice to the other riparians)[414] or of the grantee (thus treating the grantee as a full, equal riparian)[415] is the measure of the transferred right. These uncertainties are significant enough to make the purchase of a non-appurtenant riparian right little more than a hunting license that might or might not yield water. Unsurprisingly, markets do not appear to have become a major activity in Georgia.

In Georgia, courts and legislatures indicated that they could not determine the facts relating to ground water usage and thus they retreated into the proposition that the owner of land held "absolute ownership" of percolating water in the ground even when the pumping of groundwater affected a surface stream.[416] Georgia does apply riparian rights in the rare case in which a

409. *Id.* at 704; *Pyle*, 265 S.E.2d at 587–89. This part of the *Pyle* opinion elicited a single dissent, the only point on which anyone dissented in either case. *Pyle*, 265 S.E.2d at 589.

410. *Pyle*, 265 S.E.2d at 588.

411. *Stewart*, 292 S.E.2d at 704.

412. *See* Brown v. Tomlinson, 272 S.E.2d 258, 260 (Ga. 1980) (holding that laches prevented the enforcement of prescriptive rights to a reservoir); Kingsley Mill Corp. v. Edmonds, 67 S.E.2d 111, 112 (Ga. 1951) (holding that the plaintiff failed to plead prescriptive rights adequately); Anneberg v. Kurtz, 28 S.E.2d 769, 771 (Ga. 1944) (upholding a prescriptive right to pollute).

413. *Pyle*, 265 S.E.2d at 588–89.

414. *See, e.g.*, State v. Apfelbacher, 167 N.W. 244 (Wis. 1918). *See also* Lynda Butler, *Allocating Consumptive Water Rights in a Riparian Jurisdiction: Defining the Relationship Between Public and Private Interests*, 47 U. PITT. L. REV. 95, 152–53 (1985).

415. *See* RESTATEMENT, *supra* note 22, §§ 856(2), 857(2).

416. City of Atlanta v. Hudgins, 19 S.E.2d 508, 516 (Ga. 1942); Saddler v. Lee, 66 Ga. 45 (1879). *See generally* Bross, *supra* note 394, at 304–05; Murphy, *supra* note 196,

court finds "underground streams."[417] Georgia's courts limited the theory of absolute ownership in instances where they found that the water was withdrawn "maliciously"—for the purpose of hurting another landowner.[418] Georgia's courts also found potential landowner liability for creating a private nuisance through the pollution of groundwater.[419]

Reliance on riparian rights and the absolute ownership theory, notwithstanding the several limitations propounded by Georgia's courts, produced the predictable tragedy of the commons with the attendant problems reasonably to be expected when water becomes scarce relative to demand.[420] Over the past forty years, the Georgia General Assembly has enacted a broad range of statutes that regulate various aspects of water use in the state. Two statutes directly address the allocation of water to particular uses through the requirement of permits for the use of water—The Ground-water Use Act of 1972 ("Ground Water Act")[421] and a 1977 amendment to the Georgia Water Quality Protection Act of 1964 ("Protection Act").[422] These statutes impose similar permit systems on water users; the first applies to users of groundwater and the second to users of surface water. Both statutes are premised on the idea that the general welfare and public interest require that the water resources of the state be put to beneficial use to the fullest extent to which they are capable subject to reasonable regulation in order to conserve the waters and to provide and maintain conditions which are conducive to the development and use of water resources.[423]

The Ground Water Act defines "groundwater" as including all underground water, including underground streams.[424] The Protection Act defines the term "surface waters" as any body of water on the surface that lies within or along the boundary of the state, whether natural or artificial, although springs are included only if they produce more than 100,000 gallons per day.[425] The Environmental Protection Division ("Division") of the Department of Natural Resources has the sort of extensive planning responsi-

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§ 21.07(b), at 162–63.

417. Stoner v. Patten, 63 S.E. 897 (Ga. 1909). *See also* Robertson v. Arnold, 186 S.E. 806 (Ga. 1936) (stopping a spring violates riparian rights).

418. St. Amand v. Lehman, 47 S.E. 949, 950 (Ga. 1904).

419. Tri-County Inv. Group, Ltd. v. S. States, Inc., 500 S.E.2d 22, 25–26 (Ga. 1998); Hoffman v. Atlanta Gas Light Co., 426 S.E.2d 387, 390 (Ga. Ct. App. 1992).

420. *See supra* text accompanying notes 6–8, 200.

421. GA. CODE ANN. §§ 12-5-90 to -107 (2001). *See generally* Bross, *supra* note 394, at 306; Murphy, *supra* note 196, § 21.07(b), at 163–69; H. Floyd Sherrod, Jr., *The Groundwater Use Act of 1972: Protection for Georgia's Groundwater Resources*, 6 GA. L. REV. 709 (1972).

422. GA. CODE ANN. § 12-5-31 (2001). *See generally* Bross, *supra* note 394, at 306–07.

423. GA. CODE ANN. §§ 12-5-21(a), -91 (2001).

424. *Id.* § 12-5-92(6).

425. *Id.* § 12-5-31(b)(5).

bilities that are customary under regulated riparian statutes.[426] To support these planning responsibilities, both Acts authorize the Division to require extensive reporting of data and, for surface waters, to maintain a data bank on the usage of water in any area of the state.[427]

The core of both statutes is a requirement that any user who withdraws or impounds more than 100,000 gallons per day from a water source in the state must have a permit to do so that is issued by the Division.[428] Applications for permits are to be evaluated according to the same criteria of reasonableness that apply under common law riparian rights.[429] The Ground Water Act does not guarantee existing users a permit, but requires the Division to grant a permit for the reasonable needs of the water user as of July 1, 1973.[430] For surface waters, Georgia directs the Division to simply give a preference to an existing use over an initial application to begin a use.[431] There is no comparable provision in the Ground Water Act.

The Director of the Division determines the duration of permits, generally within upper and lower limits of ten to fifty years.[432] The Ground Water Act authorizes temporary permits.[433] Both Acts require holders of water use permits to report periodically on the amounts withdrawn or used, identifying the particular source of the water, and specifying the nature of the use.[434] The Ground Water Act authorizes the Division to conduct investigations to verify this data, including a right to enter onto a water users' land to conduct such investigations.[435]

For surface water, if the Division discovers a violation of an applicable law, regulation, or permit, the Protection Act authorizes the Director of the Division to revoke the permit, but only for a period of one year.[436] Georgia goes on to allow the Director to revoke, suspend, or modify a permit for the use of surface water "for any other good cause consistent with the health and safety . . . and with this article."[437] For groundwater, Georgia authorizes the Director to conciliate with a violator, but if that fails, however, the Director can issue orders for any necessary corrective action.[438] Once such an order has become final (with or without an appeal), Georgia courts must

426. *Id.* §§ 12-5-92(5), -96(e), -584 (2001 & Supp. 2001).
427. *Id.* § 12-5-31(m), -98(d) (2001).
428. *Id.* §§ 12-5-31(a)(1), -96(a)(1).
429. *See* GA. CODE ANN. §§ 12-5-31(e), (g), -96(d), -97(a) (2001).
430. *Id.* § 12-5-97(f), (g).
431. *Id.* § 12-5-31(f), (j).
432. *Id.* §§ 12-5-31(h), -97(a).
433. *Id.* § 12-5-96(c)(2).
434. *Id.* §§ 12-5-31(m), -97(d), -97(e).
435. GA. CODE ANN. § 12-5-98 (2001).
436. *Id.* § 12-5-31(k)(3).
437. *Id.* § 12-5-31(k)(8).
438. *Id.* § 12-5-99.

enforce the order without modifying it.[439] It is not clear whether such an order could include suspending or revoking the permit.

The Director may also seek an injunction without satisfying the usual requirement of showing the lack of an adequate remedy at law.[440] For groundwater violations, the Director is authorized to impose civil penalties of up to $1000, with additional penalties of $500 per day for continuing violations.[441] For surface water, civil penalties for wrongful diversion are included in the civil penalty provisions for pollution, and thus the limits are much larger—up to $50,000 per day and up to $100,000 per day if a separate violation occurs within one year of the original violation.[442] Violations of the Ground Water Act also constitute a misdemeanor.[443] Again, violations regarding surface water permits are potentially subject to harsher penalties because such violations are felonies.[444]

The two Georgia statutes make no express provision for the market transfer of a water use permit apart from the transfer of the title to the land on which the water is used. The two statutes create a possibility for such a transfer by their provisions authorizing the Division to approve a modification of a permit at the request of a permittee; apart from farm uses,[445] this is limited to situations where a change of circumstances requires more water than has hitherto been used or where a modification will allow for a more efficient use of the water.[446] The provision on modifications thus seems to contemplate a change in the pattern of use, but not a change in the type of use. If so, a market for water permits is likely to be extremely circumscribed.

For surface water, the Division can revoke a permit because of non-use of the water, the use of which is authorized by permit, for two consecutive years without proper excuse.[447] This provision, however, is more likely to prompt a permit holder to continue to waste water rather than to risk forfeiture. Even this limited possibility of forfeiture does not exist in the Ground Water Act.

Georgia did initiate an experiment in economic incentives for water allocation management in the year 2000.[448] The statute authorizes the use of

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439. *Id.* §§ 12-5-45, -100.
440. *Id.* §§ 12-5-48, -101.
441. GA. CODE ANN. § 12-5-106 (2001).
442. *Id.* § 12-5-52.
443. *Id.* § 12-5-107.
444. *Id.* § 12-5-53.
445. *See infra* text accompanying notes 451–58.
446. GA. CODE ANN. §§ 12-5-31(i), -97(a) (2001).
447. *Id.* § 12-5-31(k)(4).
448. *Id.* § 12-5-540. *See generally* Kathy Pruitt, *Bill Would Give Payments to Farmers for Not Siphoning Off River in Drought*, ATLANTA J. & CONST., Feb. 17, 2000, at 10C; Laura D. Windsor, Legislative Review, 17 GEO. ST. U. L. REV. 29 (2000).

up to $4.5 billion of Georgia's share of the tobacco settlement to pay farmers in the Flint River basin to stop well irrigation during drought years to prevent the drying of the river. The initiative for such payments lies with the farmers, not the state. There have been reports of considerable irregularities—payments denied to eligible farmers and made to ineligible farmers.[449]

Georgia authorizes emergency orders to deal with water shortages. The standards that justify the issuance of emergencies are different in the two statutes. For groundwater, the Division can issue such an order in any "situation requiring immediate action to protect the public health or welfare," directing water users to take any action that Division deems necessary to meet the emergency.[450] For surface water, the Director can issue such an order when the water shortage is such "as to place in jeopardy the health or safety of the citizens of such area or to threaten serious harm to the water resources of the area."[451] The Director cannot issue such an order for surface water except after a certified mailing to give notice to affected permit holders and a wait of five days after the mailing to allow a contest of the order.[452] For groundwater, there is no requirement of prior notice or a hearing except for farm uses.[453] Such an emergency order can restrict any water use permit.[454] Farm uses have second priority in case of water emergencies—only behind water for direct human consumption.[455]

These complex statutes represent a good beginning towards an adequate regulated riparian system. They establish in law the public nature of water and provide a mechanism for managing water resources consistent with the public trust as well as with promotion of private welfare. Thus far, no one has challenged the constitutionality of the two statutes. Courts in Georgia thus far have uniformly rejected challenges to the land use provisions of the Metropolitan River Protection Act of 1981[456] as violating due process or constituting a taking of property.[457]

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449. Will Anderson, *Flint River Farmers Bid in Water-Saving Plan*, ATLANTA J. & CONST., Mar. 18, 2001, at 3C; Richard Whitt & Julie B. Hairston, *Farmers Feel Sting of Water Payoffs*, ATLANTA J. & CONST., May 2, 2000, at 1B.

450. GA. CODE ANN. § 12-5-102 (2001).

451. *Id.* § 12-5-31(*l*)(1).

452. *Id.*

453. *Id.* § 12-5-102(a).

454. *Id.* §§ 12-5-31(*l*)(1), -102.

455. *Id.* §§ 12-5-31(*l*)(3), -102(c), -105(b)(4). With a certain irony, the legislature followed this provision with another provision that stated that "[t]he importance and necessity of water for industrial purposes are in no way modified or diminished by this Code section." *Id.* §§ 12-5-31(*l*)(4), -105(b)(5).

456. GA. CODE ANN. §§ 12-5-440 to -457 (2001).

457. Threatt v. Fulton County, 467 S.E.2d 546, 550 (Ga. 1996) (holding there was no taking of property). *See also* Pope v. City of Atlanta, 418 F. Supp. 665, 668–89 (N.D. Ga. 1976) (holding there was no denial of due process and no taking under the United States Constitution); Pope v. City of Atlanta, 240 S.E.2d 241 (Ga. 1977) (finding authority for the

Several major problems still exist, however, under the Georgia statutes in their present state. First, the Georgia statutes do not attempt to manage surface and ground waters conjunctively. That the two statutes are so similar and that they are both administered by the same agency perhaps ameliorates this problem. Yet the fact that they are separate statutes separately administered and are not identical in all respects precludes fully rationalizing water management in Georgia.

An even more important failing of the two statutes is their near complete exemption of farm uses from the operation of the permit system if the farm use began before July 1, 1988, and certain procedural steps were taken before July 1, 1991.[458] The statutes define "farm uses" as including water used for the growing of any crop (including turf, trees, and ornamental plants), for aquaculture or animal husbandry, and for the processing of perishable agricultural products.[459] The Division must issue special permits for such privileged farm uses that are irrevocable, have no term, and are automatically transferred with title to the land on which the water is used.[460] The Georgia statutes direct the Division to measure permits for farm uses by the operating capacity of the withdrawal system.[461] The permits cannot include a reporting requirement, but they are subject to investigations by the Division and can be suspended if the Division determines that the use authorized by the permit unreasonably interferes with other users.[462]

Farm uses remain far and away the largest use of water in Georgia. The virtual exclusion of farm uses from the scope of the two regulated riparian statutes (which go far beyond the exclusions of certain uses in other regulated riparian states[463]) prevents the rigorous implementation of the regulated riparian scheme such as is found in Florida. The common law principles of riparian rights and absolute ownership as developed in the Georgia cases will continue to govern disputes over water allocation involving farm uses—which constitute many or most disputes over water allocation.[464] The Georgia statutes do not even alter the common law prohibitions of use on non-riparian or non-overlying lands. Indeed, the Protection Act (which includes the regulated riparian provisions for surface water) provides that nothing in the Protection Act preempts private rights of action under the

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act under the state constitution), *appeal after remand*, 249 S.E.2d 16 (Ga. 1978) (rejecting due process and takings challenges), *on subsequent appeal*, 255 S.E.2d 63 (Ga. 1979) (ordering the grant of a permit on the basis that there was no proof of impact on the river); Bross, *supra* note 394, at 307.

458. GA. CODE ANN. §§ 12-5-31(a)(3), -105(a) (2001).

459. *Id.* §§ 12-5-31(b)(3), -92(5.1).

460. *Id.* §§ 12-5-31(a)(3), -105(b)(1)–(2).

461. *Id.* §§ 12-5-31(a)(3), -105(b)(1).

462. *Id.* §§ 12-5-31(k)(7), -105(b)(1), (3).

463. *See generally* Dellapenna, *supra* note 10, § 9.03(a)(1).

464. *See supra* text accompanying notes 397–419.

common law in general or specifically directed at suppressing a nuisance or at abating pollution.[465] While this provision is broad enough to preserve riparian rights in full force for surface water, it has no application to the Ground Water Act, leaving open the possibility of a court finding a partial or total repeal of the absolute ownership doctrine by implication. So far, no one seems to have raised this issue in a Georgia court.

The statutes also are almost completely silent regarding interstate transfers, while the provisions relating to interbasin transfers are extremely limited. The Director must give a preference to water usage within a water basin over proposed interbasin transfers.[466] There is no comparable provision in the Ground Water Act. There is no provision in either statute for public or local participation in decision-making apart from participating in public hearings when such hearings are required.[467]

E. Louisiana

Water allocation law in Louisiana is, at least superficially, completely different from the water allocation law of the other southeastern states. Upon closer examination, however, Louisiana's water allocation law turns out to be very similar to the reasonable use version of riparian rights.[468] In fact, the reasonable use theory has been subject to less legislative tinkering in Louisiana than in any other southeastern state.

Louisiana adheres to the civil law tradition rather than the common law tradition.[469] Louisiana, therefore, follows a form of riparian rights derived from its civil code rather than from the common law.[470] This system continues to work well as water in Louisiana is relatively plentiful. Indeed, observers have concluded that Louisiana law is premised on its "perpetual

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465. GA. CODE ANN. § 12-5-46 (2001).

466. *Id.* § 12-5-31(n).

467. *Id.* §§ 12-5-31(n)(2) (providing for public hearings regarding proposed interbasin transfers), -95(c) (2001) (providing for public hearings for groundwater use regulations), -97(d) (2001) (same).

468. Commentators have concluded that the right to use water in Louisiana is in most respects the same as riparian rights under the common law. *See* DAVID H. GETCHES, WATER LAW IN A NUTSHELL 212–14 (3d ed. 1997); Klebba, *supra* note 185, at 1791–1813; Ewell P. Walther, Jr., Comment, *Acquisition of the Right To Use Water*, 29 TUL. L. REV. 554, 554 (1955).

469. *See generally* Shael Herman, *The Contribution of Roman Law to the Jurisprudence of Antebellum Louisiana*, 56 LA. L. REV. 257 (1995).

470. Doiron v. O'Bryan, 51 So. 2d 628, 632 (La. 1951); Long v. La. Creosoting Co., 69 So. 281, 282 (La. 1915). The apparent source of the Louisiana code provisions was C. CIV. § 644 (Fr. 1804). *See* Patrick H. Martin, *Louisiana*, *in* 6 WATERS AND WATER RIGHTS, *supra* note 1, at 389; Jerry G. Jones, Comment, *Water Rights in Louisiana*, 16 LA. L. REV. 500, 503 (1956).

availability."[471] As a result, litigation has focused on problems of drainage and pollution rather than on the acquisition of the right to use water.[472]

The Louisiana Civil Code ("Civil Code") was revised in 1978, with few substantive changes regarding water. One change, however, reclassified running and navigable waters as "public things" belonging to "the state or its political subdivisions in their capacity as public persons."[473] The provision apparently is a statutory adoption of the doctrine known in other states as the "public trust."[474] It creates a likelihood that water that neither runs nor is navigable is privately owned, or at least not subject to the local version of the public trust. The federal courts have now held that under state law there are no public rights to water in Louisiana that is not naturally navigable.[475] It remains to be seen whether Louisiana's courts will agree.

As far as private uses of water are concerned, the Civil Code contains three relevant provisions. The Civil Code provides that "[t]he owner of an estate bordering on running water may use it as it runs for the purpose of watering his estate or for other purposes."[476] An identical provision governs running water which "runs over" the estate, except that the owner is bound to return the water to its ordinary channel before it leaves the estate.[477] Finally, the Civil Code provides that one cannot lawfully use one's property if it interferes with the like use of a neighbor or causes any damage to the neighbor.[478]

The Civil Code provisions, by their own terms, apply only to water running in defined surface water bodies; the provisions do not apply to water that does not "run."[479] The rights defined in the Civil Code are, like classic riparian rights, considered "accessory rights," which attach to riparian lands because of their adjacency to the water source.[480] Apparently then, the

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471. Levine, *supra* note 188, at 1128; Martin, *supra* note 470, at 389. *See also* Klebba, *supra* note 185, at 1779; Walther, *supra* note 468, at 562.

472. *See, e.g.*, Mossy Motors, Inc. v. Sewerage & Water Bd. of New Orleans, 753 So. 2d 269 (La. Ct. App. 1999); Aydell v. Morales, 707 So. 2d 158 (La. Ct. App. 1998).

473. LA. CIV. CODE ANN. art. 450 (West 1980 & Supp. 2002). *See generally* Klebba, *supra* note 185, at 1800–13.

474. *See generally* Martin, *supra* note 470, at 393–94.

475. St. Martin v. Mobil Exploration & Producing U.S., Inc., 224 F.3d 402 (5th Cir. 2000); Dardar v. LaFourche Realty Co., 985 F.2d 824 (5th Cir. 1993). *See also* Martin, *supra* note 470, at 390.

476. LA. CIV. CODE ANN. art. 657 (West 1980).

477. *Id.* art. 658.

478. *Id.* art. 667 (West Supp. 2002).

479. Hall v. Bd. of Comm'rs, 35 So. 976, 980 (La. 1904); State v. Bourdon, 535 So. 2d 1091, 1096 (La. Ct. App. 1988); Verzwyvelt v. Armstrong-Ratterree, Inc., 463 So. 2d 979, 984–85 (La. Ct. App. 1985); Adams v. Grigsby, 152 So. 2d 619, 621 (La. Ct. App. 1963). *See also* Jones, *supra* note 470, at 505–07; Klebba, *supra* note 185, at 1793.

480. Delachaise v. Maginnis, 11 So. 715, 716 (La. 1892). *See also* Martin, *supra* note 470, at 390.

right to use water cannot be conveyed apart from the land.[481] Prescription applies to water rights in Louisiana.[482]

Like so many other states committed to riparian rights, however, the language of the Civil Code provisions does not clearly adopt either the natural flow theory or the reasonable use theory.[483] One might think that the obligation to return the water to its natural channel before it leaves the land implicitly endorses the natural flow theory, but no Louisiana case has so held.[484] Louisiana's few cases,[485] however, have applied reasonable use notions without explicit reference to the Civil Code provisions.[486] On the other hand, if only because of the plentifulness of water, withdrawals for use on non-riparian lands are common in Louisiana and seem to be accepted by the legislature and the courts, as well as other users, without any explicit statutory authority for such withdrawals.[487] Whether one can transfer a riparian right apart from transferring the title to riparian land simply has not come up.[488]

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481. *See also* LA. CIV. CODE ANN. arts. 649, 650 (West 1980); Jones, *supra* note 470, at 504, 507–08; Klebba, *supra* note 185, at 1795–98.

482. LA. CIV. CODE ANN. art. 758 (West 1980). *See* Crump v. Sabine River Auth., 737 So. 2d 720, 731 (La. 1999) (applying prescription to the diversion of water from its natural channel cutting off the plaintiff's access to the water); Young v. Int'l Paper Co., 155 So. 231, 232–33 (La. 1934) (upholding a claim of prescription against a claim for damage for flooding adjoining land with polluted water); Becknell v. Weindhal, 7 La. Ann. 291 (1852) (holding that failure to object to an open obstruction of drainage implicitly waives the right to a drainage servitude); Eubanks v. Bayou D'Arbonne Lake Watershed Dist., 742 So. 2d 113, 114 (La. Ct. App. 1999) (holding an action for damages for interference with surface drainage to be prescribed). *See also* Klebba, *supra* note 185, at 1792–95

483. *See generally* 4 ATHANASSIOS N. YIANNOPOULOS, LOUISIANA CIVIL LAW: PREDIAL SERVITUDES § 22 (1983).

484. Only one case might have put the point in issue, but the court did not cite the relevant Civil Code provision and declined to enjoin a diversion of a substantial amount of water into a canal. Ilhenny v. Broussard, 135 So. 669 (La. 1931).

485. While Louisiana does not officially follow the rule of stare decisis for Civil Code provisions, the bench and bar effectively treat the Civil Code and precedents much like statutes and cases are treated in common law states.

486. Long v. La. Creosoting Co., 69 So. 281 (La. 1915); Jackson v. Walton, 2 La. App. 53 (1925). *See also Ilhenny*, 135 So. at 669. *See generally* Klebba, *supra* note 185, at 1798–1800; Martin, *supra* note 470, at 390–91.

487. *See, e.g.*, *Jackson*, 2 La. App. at 53. The legislature has explicitly authorized certain non-riparian uses by statute. LA. REV. STAT. ANN. §§ 19:2(4) (West Supp. 2002) (waterworks companies), 33:841 (West 2002) (municipalities), 33:3815 (West 2002) (waterworks districts), 38:2112 (West 1989) (irrigation districts), 38:2551–2572 (West 1989 & Supp. 2002) (certain special purpose districts), 38:3085.1–3085.8 (West 1989) (certain special purpose districts), 45:61 (West 2000) (irrigation companies).

488. The closest we find is a riparian's grant of an easement of access to the waterfront to a non-riparian. *See* Keeley v. Schexnailder, 708 So. 2d 838 (La. Ct. App. 1998). The court upheld the right of access, but did not address whether it would uphold a grant of the right to withdraw water. *Id.* at 843.

For groundwater, Louisiana follows the absolute ownership rule.[489] This result derives from another provision of the Civil Code. Section 490 reads, "[u]nless otherwise provided by law, the ownership of a tract of land carries with it the ownership of everything that is directly above or under it."[490] This language does not actually require that one's ownership be absolute, but that is how the Louisiana Supreme Court has interpreted it.[491] The court did indicate that the malicious or negligent waste of water would be actionable.[492] Louisiana courts have simply ignored these statutory provisions in cases regarding the pollution of groundwater, where torts such as negligence and nuisance are routinely applied.[493]

The Louisiana Mineral Code ("Mineral Code"), enacted in 1974, is even more explicit in supporting these conclusions. Article 8 of the Mineral Code reads:

> A landowner may use and enjoy his property in the most unlimited manner for the purpose of discovering and producing minerals, provided it is not prohibited by law. He [sic] may reduce to possession and ownership all of the minerals occurring naturally in a liquid or gaseous state that can be obtained by operations on or beneath his land even though his operations may cause their migration from beneath the land of another.[494]

Despite this sweeping language, other provisions of the Mineral Code make clear that the rights conferred by this section are shared with neighboring landowners and thus are reasonably limited by the rights of the neighbors: "Landowners and others with rights in a common reservoir or deposit of minerals have correlative rights and duties with respect to one another in the development and production of the common source of minerals."[495] The Mineral Code then provides in article 10:

> A person with rights in a common reservoir or deposit of minerals may not make works, operate, or otherwise use his [sic] rights so as to de-

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489. *See* Murphy, *supra* note 196, § 21.03.

490. LA. CIVIL CODE ANN. art. 490 (West 1980). *See generally* Klebba, *supra* note 185, at 1819–33; Levine, *supra* note 188, at 1128–33; Martin, *supra* note 470, at 392–93.

491. Adams v. Grigsby, 152 So. 2d 619 (La. Ct. App. 1963).

492. *Id.* at 624.

493. *See, e.g.*, Kaufman v. Sewerage & Water Bd. of New Orleans, 762 So. 2d 644 (La. Ct. App. 2000); Mossy Motors, Inc. v. Sewerage & Water Bd. of New Orleans, 753 So. 2d 269 (La. Ct. App. 1999); Bartlett v. Browning-Ferris Indus., 683 So. 2d 1319 (La. Ct. App. 1996). *See also* Mongrue v. Monsanto Co., 249 F.3d 422 (5th Cir. 2001); Licciardi v. Murphy Oil U.S.A., Inc., 111 F.3d 396 (5th Cir. 1997).

494. LA. REV. STAT. ANN. § 31:8 (West 2000).

495. *Id.* § 31:9. *See generally* Eugene Kuntz, *Correlative Rights of Parties Owning Interests in a Common Source of Supply of Oil or Gas*, 17 INST. ON OIL & GAS L. & TAX'N 217 (1966).

> prive another intentionally or negligently of the liberty of enjoying his rights, or that may intentionally or negligently cause damage to him. This Article and Article 9 shall not affect the right of a landowner to extract liquid or gaseous minerals in accordance with the principle of Article 8.[496]

Finally, the Mineral Code goes on to provide in article 11:

> The owner of land burdened by a mineral right or rights and the owner of a mineral right must exercise their respective rights with reasonable regard for those of the other. Similarly the owners of separate mineral rights in the same land must exercise their respective rights with reasonable regard for the rights of other owners.[497]

Louisiana courts have not considered whether groundwater is included within the purview of the Mineral Code, although Louisiana courts have indicated in dicta in two earlier decisions that water, oil, and gas were subject to the same body of law.[498] Despite apparently embracing a rule of sharing in articles 9 through 11, these provisions are carefully expressed so as not to contradict the absolute ownership approach of article 8. This is particularly explicit in the proviso at the end of article 10. Before enactment of the Mineral Code, Louisiana courts in the oil and gas context had used the general obligation of "good neighborliness" expressed in the Civil Code[499] to impose liability at least in the context of wasteful operation of a well.[500] Whether this approach is still valid remains unclear, particularly regarding groundwater.

Whether in the end Louisiana actually embraces the absolute ownership doctrine, some form of correlative rights, or the reasonable use theory for groundwater may not be established for a long time given the relative plentifulness of water. For the same reason, the legislature has not felt it necessary to introduce a regulated riparian system for either surface water or groundwater. Thus, among the southeastern states, Louisiana remains closer to the classic common law of water rights for both surface water and groundwater than any of the common law states in the region.

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496. LA. REV. STAT. ANN. § 31:10 (West 2000).

497. *Id.* § 31:11.

498. Higgins Oil & Fuel Co. v. Guar. Oil Co., 82 So. 206 (La. 1919); Adams v. Grigsby, 152 So. 2d 619, 622–23 (La. Ct. App. 1963).

499. LA. CIVIL CODE ANN. art. 667 (West Supp. 2002).

500. *See, e.g., Higgins Oil & Fuel Co.*, 82 So. at 212.

F. Mississippi

According to one source, at least nine eastern states have seriously considered the possibility of adopting appropriative rights.[501] There has been, however, only one abortive attempt actually to do so to date—when Mississippi enacted an appropriation statute in 1956.[502] The attempt ended in 1985 with Mississippi's repeal of its appropriation statute,[503] after courts in Mississippi had virtually ignored the statute's existence during the twenty-nine years the statute was in force.[504]

Before these statutory adventures, Mississippi had followed the reasonable use version of riparian rights for surface water[505] and the absolute ownership rule for groundwater.[506] Courts in Mississippi have evaded the absolute ownership rule when the complaint concerns pollution rather than the allocation of groundwater, turning instead to torts like negligence or nuisance.[507] Today the regulated riparian system that Mississippi has both enacted and implemented presumably preempts these bodies of law, but given the history with regard to the appropriative rights statute, one cannot be entirely certain that courts will agree.

The current water allocation law of Mississippi is a rather standard regulated riparian statute.[508] Because Mississippi enacted its statute fairly late compared to the regulated riparian statutes in most of the other states in the region, it includes a number of advances in design. Thus, the Mississippi statutory scheme mandates the conjunctive management of surface water and groundwater.[509] The statute also is careful to declare that it creates a set

501. *See* MALONEY, AUSNESS, & MORRIS, *supra* note 40, at 75–76 (listing Arkansas, Florida, Georgia, Michigan, Mississippi, North Carolina, South Carolina, West Virginia, and Wisconsin as having actively considered the adoption of appropriative rights). What is not clear is whether these states were actually considering an appropriative rights system or a regulated riparian system. *See supra* text accompanying note 139.

502. MISS. CODE ANN. §§ 51-3-3(g)(2), 51-3-7 (1972, repealed 1985). *See generally* Champion, *supra* note 100.

503. MISS. CODE ANN. §§ 51-3-1 to -15 (2001). *See generally* Murphy, *supra* note 196, § 21.07(e); Al Sage, *Mississippi*, *in* 6 WATERS AND WATER RIGHTS, *supra* note 1, at 445.

504. *See* Anderson-Tully Co. v. Franklin, 307 F. Supp. 539 (N.D. Miss. 1969); Haisch v. Southaven Land Co., 274 F. Supp. 392 (N.D. Miss. 1967); Phillips v. Davis Timber Co., 468 So. 2d 72 (Miss. 1985); Black v. Wiliams, 417 So. 2d 911 (Miss. 1982); Hinds-Rankin Metrop. Water & Sewer Ass'n v. Reid, 256 So. 2d 373 (Miss. 1971); Downes v. Crosby Chems., Inc., 234 So. 2d 916 (Miss. 1970). *See generally supra* text accompanying notes 97–110.

505. Miss. Mills Co. v. Smith, 11 So. 26, 27–28 (Miss. 1892).

506. Bd. of Supervisors v. Miss. Lumber Co., 31 So. 905 (Miss. 1902).

507. *See, e.g.*, Bradley v. Armstrong Rubber Co., 130 F.3d 168, 174 (5th Cir. 1997).

508. MISS. CODE ANN. §§ 51-3-1 to -55 (2001). *See generally* Murphy, *supra* note 196, § 21.07(e); Sage, *supra* note 503, at 445.

509. MISS. CODE ANN. §§ 51-3-1, -29 (2001). The statute's definitions of "surface water" and "groundwater" are extremely general—all water occurring on the surface of the ground,

of regulations under the state's police power,[510] a provision that could prove helpful if the statute were ever challenged as a taking. The same provision that expressed the foregoing two provisions also expresses the policy that the water be put to its fullest possible beneficial use, while at the same time expressing the policies of preventing waste or unreasonable use, promoting the conservation of water, and encouraging the investment of public and private funds for the promotion and expansion of the beneficial use of water.[511]

In order to accomplish the foregoing ends, Mississippi's statutes create a permit board ("Board") to administer permits for a number of purposes relating to the use of water, including for the withdrawal and use of water.[512] The statute requires all persons proposing to use water to obtain a permit unless the statute provides a specific exemption.[513] Exemptions include the following:

(1) Persons who held valid appropriative rights on the effective date of the regulated riparian statute and who took the necessary procedural steps to preserve the appropriative rights;[514]
(2) Persons who use water only for domestic uses;[515]
(3) Persons who use surface water from impoundments not located on continuous, free-flowing watercourses;[516] and
(4) Persons drawing water from a well with a surface casing diameter of less than six inches, except for certain real estate developers.[517]

The Board was directed to issue holders of appropriative rights a permit, and the holders must refile for a renewal of their permit every ten years.[518] It is not clear whether the renewal permit continues to carry forward the appropriative rights of the first permit or brings the water used within the regulated riparian system. In any event, holders of appropriative rights must comply with regulations promulgated to protect the public

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and all water occurring beneath the surface of the ground respectively. *Id.* § 51-3-3(b), (n).

510. *Id.* § 51-3-1.

511. *Id.*

512. *Id.* § 49-17-28(1) (2001).

513. *Id.* § 51-3-5.

514. *Id.* § 51-3-5(2)–(3).

515. MISS. CODE ANN. § 51-3-7(1) (2001). "Domestic use" is defined as "the use of water for ordinary household purposes, the watering of farm livestock, poultry and domestic animals and the irrigation of home gardens and lawns." *Id.* § 51-3-3(c) (1999).

516. *Id.* § 51-3-7(1). "Watercourse" is defined as "any natural lake, river, creek, cut, or other natural body of fresh water or channel having definite banks and bed with visible evidence of the flow or occurrence of water, except such lakes without outlet to which only one (1) landowner is riparian." *Id.* § 51-3-3(h).

517. *Id.* § 51-3-7(1).

518. *Id.* § 51-3-9(4).

health or welfare.[519] The Board also can require a permit for any exempt use (except for grandfathered appropriate rights) in excess of 20,000 gallons per day in a "water use caution area."[520]

The Board's functions are limited to processing applications for new permits or renewing existing permits.[521] Permits are to be issued for any beneficial use.[522] Beneficial use is defined simply as "the application of water to a useful purpose as determined by the commission, but excluding waste of water."[523] Although, most permits expire after ten years,[524] the Board can give municipalities, other governmental units, or regulated public utilities a longer permit to match the period of the amortization of their investment.[525] If the permit holder applies to renew an expiring permit, the Board must renew the permit unless continuation of the use would be contrary to the public interest.[526] Yet, the Board may modify any permit upon sixty days written notice.[527] The statute does not specify any standards for such a modification. The Board may revoke a permit for violation of its terms or conditions.[528] On the other hand, the Board is also authorized to issue temporary or emergency permits whenever such a permit is "essential."[529]

Mississippi's Commission on Environmental Quality ("Commission") plays a prominent role in circumscribing the powers of the Board.[530] The Board has authority to allocate water only in excess of such established minimum flows or levels that are to be set by the Commission.[531] "Established minimum flow" and "established minimum lake level" are defined (somewhat unhelpfully) as "the minimum [flow] [lake level] for a given [stream] [at a given point thereon] [lake] as determined and established by the commission when reasonably required for the purposes of this chapter."[532] Both definitions also require that the Commission, in setting these flows and levels, consider "generally accepted scientific methodologies."[533] The definition for "established minimum flows" further provides a particu-

519. *Id.*
520. *Id.* §§ 51-3-7(1), -11.
521. *See* MISS. CODE ANN. §§ 51-3-13, -15, -31, -33, -35 (2001). *See generally* Sage, *supra* note 503, at 448–51.
522. MISS. CODE ANN. § 51-3-13 (2001).
523. *Id.* § 51-3-3(e).
524. *Id.* § 51-3-9(1).
525. *Id.* § 51-3-9(2).
526. *Id.* § 51-3-9(1).
527. *Id.* § 51-3-15(2)(c).
528. MISS. CODE ANN. § 51-3-15(2)(d) (2001).
529. *Id.* § 51-3-15(2)(b).
530. *Id.* § 49-2-5 (1999) (creating the Commission on Environmental Quality).
531. *Id.* § 51-3-7(2), (3).
532. *Id.* § 51-3-3(i), (j).
533. *Id.*

lar formula that the Commission may use[534] and requires it to consider "consumptive and nonconsumptive water uses, including, but not limited to, agricultural, industrial, municipal and domestic uses, assimilative waste capacity, recreation, navigation, fish and wildlife resources and other ecologic values, estuarine resources, aquifer recharge, and aesthetics."[535]

The Board is also forbidden to issue a permit for a use of water that would cause the quality of a stream to fail to meet the applicable water quality standards at minimum stream flow,[536] or if the withdrawal of water would impair the navigability of any watercourse.[537] Also, the Board may not issue a permit that would require the "mining" of an aquifer unless the permit holder has made a definite commitment to substitute water from another source that would not involve groundwater mining.[538] These standards are also all likely to involve determinations made by the Commission rather than the Board.

Potentially the most important power vested in the Commission is its power to declare a "water use caution area."[539] The Commission is to declare a water use caution area whenever it determines (using generally accepted scientific methodologies) that the water in a water source is not adequate to meet current or foreseeable needs, or if an aquifer is subject to groundwater mining.[540] The Commission must give notice of and conduct a public hearing on the proposal to establish a water use caution area, including any proposed restrictions on water use with the caution area.[541] After the conclusion of the public hearing, the Commission can establish the caution area and restrict existing uses notwithstanding the permit for the use.[542]

The Commission is also vested with the authority to adopt regulations to assure beneficial use and to minimize waste.[543] The Commission must also create a state water management plan.[544] In order for it to acquire the necessary information to enable it to perform its planning functions, the Commission can require all permit holders to file periodic reports on actual water usage.[545] The employees of the Commission and any other agency

534. MISS. CODE ANN. § 51-3-3(i) (2001) ("The average streamflow rate over seven (7) consecutive days that may be expected to be reached as an annual minimum no more frequently than one (1) year in ten (10) years (7Q10).").
535. *Id.*
536. *Id.* § 51-3-7(4).
537. *Id.* § 51-3-7(5).
538. *Id.* § 51-3-7(6).
539. *Id.* § 51-3-11.
540. MISS. CODE ANN. § 51-3-11(1)(a) (2001).
541. *Id.* §§ 51-3-11(3), -51.
542. *Id.* § 51-3-11(3)(b).
543. *Id.* § 51-3-25(a), (d).
544. *Id.* § 51-3-21.
545. *Id.* § 51-3-23.

must protect the confidentiality of trade secrets or any other information regarding business activities, subject to a fine of $1000 for each violation.[546]

The Board must approve all changes in the place of withdrawal or use before the change is made, but the fine for violating this requirement is only $200 per day.[547] No other provisions of the Mississippi regulated riparian statute address changes in pattern of use. There is thus no express provision regarding market transfers of water rights, although the provision regarding change in the place of withdrawal or use could be interpreted broadly to reach market transfers. The statute neither expressly repeals nor alters the common law of riparian rights or of groundwater. Indeed the statute requires the Board to issue a permit in compliance with the terms of any judgment by a court adjudicating the right to use water.[548]

Finally, enforcement of the permits is vested in yet another commission, the Commission on Natural Resources.[549] Members of the Commission on Natural Resources or of the Board (or any person authorized by either body) are authorized to enter onto and inspect any land to determine whether the permit holder is complying with the permit.[550] Any violation of a permit, or the submission of false information required to be reported by the statute, is a misdemeanor subject to a fine of not less than $100 for each day for each violation.[551] In the alternative, the Commission on Natural Resources may also assess a civil penalty of not more than $25,000 per day for each violation.[552] It may also seek an injunction in cases of "imminent and substantial hazard" without needing to prove the absence of an adequate remedy at law or the presence of future irreparable injury.[553]

G. South Carolina

For surface water, South Carolina remains committed to riparian rights in its reasonable use version.[554] It applies the reasonable use rule both to withdrawals of water from a watercourse and to discharges into a watercourse.[555] There is, of course, no right to discharge in violation of water

546. *See* MISS. CODE ANN. § 51-3-44 (2001).
547. *Id.* § 51-3-45.
548. *Id.* § 51-3-47.
549. *Id.* § 51-3-55(1).
550. *Id.* § 51-3-43.
551. *Id.* § 51-3-55(2).
552. MISS. CODE ANN. § 51-3-55(3) (2001).
553. *Id.* § 51-3-55(5).
554. White v. Whitney Mfg. Co., 38 S.E. 456, 460–62 (S.C. 1901). *See generally* Stephen A. Spitz, *South Carolina*, *in* 6 WATERS AND WATER RIGHTS, *supra* note 1, at 733–36; Edward P. Guerard, Jr., Note, *The Riparian Rights Doctrine in South Carolina*, 21 S.C. L. REV. 757 (1969).
555. United States v. 531.13 Acres of Land, 366 F.2d 915, 919 (4th Cir. 1966).

quality standards. The relatively few cases regarding riparian rights in South Carolina suggest that water supply generally is so much more than demand that a common property system with little or no state regulation might still be suitable in South Carolina.

Even without extensive litigation arising under riparian rights in South Carolina, the state's legislature has intervened in the water allocation law of the state. The South Carolina Surface Water Withdrawal and Reporting Act[556] only requires people withdrawing water from surface sources to report the extent of their withdrawals, without any regulation whatsoever of the withdrawals or uses involved. In contrast, the Interbasin Transfer of Water Act ("Transfer Act")[557] requires a permit for the transfer of water from one river basin to another if the transfer involves the lesser of five percent of seven-day, ten-year low flow of the watercourse from which the water is taken or 1,000,000 gallons per day.[558] The Transfer Act grandfathers interbasin transfers in existence or under construction on the effective date of the Transfer Act (December 1, 1984) if they are registered within six months of the effective date.[559]

The South Carolina Department of Health and Environmental Control ("Department") is to issue a permit according to the usual standards of reasonableness found in regulated riparian statutes, but with special emphasis on the needs of the basin of origin.[560] Special provisions in the Transfer Act are designed to assure the protection of the water quality in the basin of origin.[561] It also specifically protects the right of anyone in the basin of origin to recover damages for an injury to that person's riparian rights.[562] The permits are to last, in the discretion of the Department, between twenty and forty years.[563] The Department may modify or suspend the permits "for good cause."[564] Permits can be renewed on the same basis as their initial issuance.[565] Permits, however, cannot be transferred without the permission of the Department.[566] Violations of the Transfer Act are a misdemeanor punishable by a fine between $1000 and $10,000 per violation.[567] The Department may obtain an injunction, but no special provision relieves it of any of the usual requirements (such as proof that there is no adequate rem-

556. S.C. CODE ANN. §§ 49-4-10 to -80 (West Supp. 2001).
557. *Id.* §§ 49-21-10 to -80.
558. *Id.* § 49-21-20.
559. *Id.* § 49-21-50.
560. *Id.* §§ 49-21-10(1), -30(C), -30(F).
561. *Id.* § 49-21-30(D)–(E).
562. S.C. CODE ANN. § 49-21-30(G) (West Supp. 2001).
563. *Id.* § 49-21-40(A).
564. *Id.* § 49-21-40(B).
565. *Id.* § 49-21-40(C).
566. *Id.* § 49-21-40(D).
567. *Id.* § 49-21-70(A).

edy at law or that there will be an irreparable injury) for obtaining an injunction.[568]

While the Transfer Act is not specifically directed at interstate transfers of water, the state legislature was certainly aware that the Act would reach such transfers. It specifically authorizes the Department to negotiate interstate compacts pursuant to the Act, although the legislature would still have to approve the compact.[569] Whether the Transfer Act will withstand a challenge under the interstate commerce clause of the Federal Constitution has not yet been raised in court.[570]

South Carolina has very little case law addressing the allocation of groundwater.[571] Even without much evidence of legal problems regarding groundwater allocation in South Carolina and without any extensive regulatory intervention regarding surface water, however, the state's legislature enacted a comprehensive regulated riparian statute for groundwater in 1969—the Groundwater Use and Reporting Act ("Reporting Act").[572] This Act goes much further than the Transfer Act in that it applies to all withdrawals and uses of groundwater, not merely to interbasin transfers.

The Reporting Act defines groundwater somewhat narrowly as "water in the void spaces of geologic materials within the zone of saturation."[573] It opens with a fairly standard policy declaration:

> The General Assembly declares that the general welfare and public interest require that the groundwater resources of the State be put to beneficial use to the fullest extent to which they are capable, subject to reasonable regulation, in order to conserve and protect these resources, prevent waste, and to provide and maintain conditions which are conducive to the development and use of water resources.[574]

The Reporting Act requires the Department to establish a statewide groundwater management program.[575] It also requires all persons withdrawing groundwater to register their withdrawals and uses with the Department.[576] The Reporting Act then charges the Department to monitor and assess all groundwater withdrawals in the state.[577] If the Department deter-

568. S.C. CODE ANN. § 49-21-70(B) (West Supp. 2001).
569. *Id.* § 49-21-80.
570. *Cf.* Sporhase v. Nebraska *ex rel.* Douglas, 458 U.S. 941 (1982) (applying the federal commerce clause to strike down Nebraska's law prohibiting the interstate transfer of groundwater).
571. *See* Spitz, *supra* note 554, at 735–36.
572. S.C. CODE ANN. §§ 49-5-10 to -150 (West Supp. 2001).
573. *Id.* § 49-5-30(10).
574. *Id.* § 49-5-20.
575. *Id.* §§ 49-5-40, -110.
576. *Id.* §§ 49-5-40, -80 to -90.
577. *Id.* § 49-5-50.

mines that excessive groundwater withdrawals threaten the natural resources of the state; the public health, safety, or economic welfare; or the long-term integrity of the aquifer from which the water is withdrawn, the Department is to declare a capacity use area in which withdrawals become subject to permitting and regulation by the Department.[578] The Department must develop a groundwater management plan for the capacity use area and issue permits consistently with the plan.[579] One capacity use area—the Coastal Plain Capacity Use Area—had already been established before the Reporting Act was enacted, and was continued in effect under the Reporting Act.[580]

The Reporting Act fully exempts from its scope the following:[581]

(1) emergency withdrawals;[582]
(2) withdrawals for non-consumptive uses;
(3) withdrawals for the purpose of wildlife habitat management; and
(4) withdrawals for a single household for non-commercial use.

The foregoing exemptions extend not only to the possible permit requirement, but even to the registration requirement. Additionally, the Reporting Act exempts from the permit requirement (but not from the registration requirement) the following:[583]

(1) dewatering operations;[584]
(2) new wells reaching crystalline bedrock in the Coastal Plain Groundwater Management Area; and
(3) new wells replacing existing wells.

It also exempts certain aquifer storage and recovery wells regulated under the Underground Injection Control Regulations.[585] Finally, it authorizes the Department to exempt certain small wells.[586]

The Reporting Act requires that all natural or artificial artesian wells with a flow of more than 5000 gallons per day be capped, and a landowner where the well is found is limited to using the water only to the extent actually necessary to meet that person's needs.[587] The Reporting Act does not include any provision regarding interbasin or interstate transfers or transfers

578. S.C. CODE ANN. § 49-5-60 (West Supp. 2001).
579. *Id.* §§ 49-5-30(11), -60(B), -60(C), -100.
580. *Id.* §§ 49-5-30(4), -150.
581. *Id.* § 49-5-70(A).
582. *Id.* § 49-5-30(7) (defining emergency withdrawals).
583. *Id.* § 49-5-70(B).
584. S.C. CODE ANN. § 49-5-30(6) (West Supp. 2001) (defining dewatering operations).
585. *Id.* §§ 49-5-30(2), -70(C)(1); 25A S.C. CODE ANN. REGS. 61-87 (1989).
586. S.C. CODE ANN. § 49-5-70(D).
587. *Id.* §§ 49-5-30(9), -130.

of permits. It explicitly declares that it in no way alters rights to use surface water in the state.[588]

Willful violations of the Reporting Act are a misdemeanor punishable by a fine of not more that $1000 per day per violation.[589] The Department may also assess a civil penalty of up to $1000 per day per violation without regard to its willfulness.[590] The Department further may obtain an injunction, but there is no special provision relieving it of any of the usual requirements (such as proof that there is no adequate remedy at law or that there will be an irreparable injury) for obtaining an injunction.[591]

VII. CONCLUSION

Elsewhere, I have written about the forces driving change in water allocation law in many places around the world.[592] Foremost among those forces has been the burgeoning demand arising both from growing population and from changing patterns of use.[593] Changing patterns of use have included both increased withdrawals of water to use in agriculture and industry, and increased pollution resulting from human use of water. Recent decades have seen some increases in the efficiency of water use as the cost of using water has risen and a decrease of water pollution because of regulations and incentives pursuant to the Clean Water Act.[594] Nonetheless, much more water is withdrawn today than fifty years ago, and the pollution loads of water sources are heavier than they were seventy-five or 100 years ago. As a result, many observers are convinced that shortfalls in meeting the demand for water are becoming, and will continue to become, more common.[595]

In this article, I have examined the patterns of legal change regarding water allocation in the seven southeastern states—Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, and South Carolina. With the excep-

588. *Id.* §§ 49-5-30(20), -140.

589. *Id.* § 49-5-120(A).

590. *Id.* § 49-5-120(B).

591. *Id.* § 49-5-120(D).

592. *See* Joseph W. Dellapenna, *Adapting the Law of Water Management to Global Climate Change and Other Hydropolitical Stresses*, 35 J. AM. WATER RESOURCES ASS'N 1301 (1999).

593. *See* Joseph W. Dellapenna, *Population and Water in the Middle East: The Challenge and Opportunity for Law*, 7 INT'L J. ENV'T & POLLUTION 72 (1997).

594. *See, e.g.*, Robert Benjamin Naeser & Lynne Lewis Bennett, *The Cost of Noncompliance: The Economic Value of Water in the Middle Arkansas River Valley*, 38 NAT. RESOURCES J. 445 (1998); Sherry J. Tippett & Craig O'Hare, *Using Price To Limit Water Use: A Case Study of the City of Santa Fe*, 39 NAT. RESOURCES J. 169 (1999).

595. *See generally* ASHWORTH, *supra* note 9; Abrams, *supra* note 9, at 1405–46; Corbett, *supra* note 9, at 454.

tion of Louisiana and possibly Mississippi, all of the southeastern states have experienced severe droughts in recent decades.[596] This fact perhaps explains why in all of these states except Louisiana, the legislature has intervened to one degree or another. All of these states have enacted a variant of regulated riparianism, ranging from what still appears to be only a nominal regulated riparian system in Alabama and Arkansas to fully developed and fully implemented systems in Florida and Mississippi. Georgia and South Carolina have enacted well-developed regulated riparian systems, but apply them only to a minority of water users in the state.

In general, the pattern of enactment of regulated riparian systems in these states support the unfortunate conclusion that such fundamental changes in water allocation law are not likely to happen except in response to a crisis perceived as such by most or all interest groups in the state.[597] In theory there is no reason why a far-sighted legislature could not anticipate developing problems and enact a regulated riparian system well in advance of an actual crisis. Mississippi, which does not seem to have suffered widespread or severe droughts in recent decades, is perhaps an unusual example in this regard. If so, it is somewhat surprising. It is clear that in all of the southeastern states, the enactment of such a system came in response to a widely perceived crisis and not in anticipation of the possibility of a crisis. Louisiana's failure to act is precisely because there has been too much rather than too little water.[598]

In addition to the problems of recurring and increasingly severe droughts, several of the states in the region have become embroiled in interstate disputes. Given the strictures of the Federal Commerce Clause,[599]

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596. The most recent has centered particularly on Alabama, Florida, and Georgia. *See* Will Anderson, *Waking up—to Water: Residents Forced to Adapt to Routine in Response to the Relentless Drought Crippling the North Georgia Area*, ATLANTA J. & CONST., June 15, 2000, at 1B; Richard Lezin Jones, *Southeast Panting, Before the Dog Days*, PHILA. INQUIRER, July 16, 2000, at A3; Eliott Minor, *State's Drought Threatens Rare Wildlife Species: Weather Tough on Amphibians*, FLA. TIMES-UNION, June 5, 2000, at A-1; Charles Seabrook, *Drought Parches Georgia*, ATLANTA J. & CONST., May 7, 2000, at 1A; Charles Seabrook, *Dry2K: State Failed To Plan for Drought*, ATLANTA J. & CONST., June 19, 2000, at 1A; Charles Seabrook, *Wild Georgia: Drought Forcing Creatures To Change Feeding Habits*, ATLANTA J. & CONST., July 27, 2000, at 7HG; Maurice Tamman, *Sand Drier than Dust: Parts of Peach State Approaching Desertlike Conditions, with Rest Headed that Way*, ATLANTA J. & CONST., June 3, 2000, at 6E; Dave Williams, *Despite Flooding, Water Use Restricted: Georgia Lacking Any Form of Drought Plan*, FLA. TIMES-UNION, June 25, 2000, at A-1. This drought followed by only a decade the second most severe drought in the three states in the twentieth century. Charles Seabrook, *Atlanta To Get More Water from Lanier*, ATLANTA J. & CONST., June 10, 1988, at 1A.

597. *See* Abrams, *supra* note 185; Ray Jay Davis et al., *Influencing Water Legislative Development: What To Do and What To Avoid*, 31 WATER RESOURCES BULL. 583 (1995).

598. *See supra* note 471.

599. *See* Sporhase v. Nebraska *ex rel.* Douglas, 458 U.S. 941 (1982).

states that set about to regulate interstate transfers must apply the same (or very nearly the same) regulations to water users within the state. Thus the laws in several of the states—Alabama, Arkansas, Florida, and South Carolina—have more or less elaborate provisions addressing interstate or interbasin transfers, or both.[600] And, of course, recurring droughts and increasing demand create or exacerbate interstate disputes.

The problems driving the legal transition described in this article are not going to go away. In fact, these problems are likely to become more intense as global climate change increasingly impacts precipitation patterns.[601] Thus, one is likely to see all of the southeastern states, except perhaps Louisiana, continue to revise their water allocation laws in the direction of greater state management and regulation. States have enacted new or revised regulated riparian statutes within the past dozen years and several—particularly Georgia—are intensely engaged in reviewing their water allocation laws at this time. Given the failure of traditional riparian rights in the face of water shortage,[602] the impracticality of importing an appropriative rights regime,[603] and the unfeasibility of devising true markets for water,[604] these changes are likely to continue to involve the perfecting of regulating riparian systems.[605]

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600. *See supra* text accompanying notes 237–40, 284–89, 329–32, 363–66, 554–68. Georgia, currently embroiled in several interstate disputes, thus far has very little in its regulated riparian system that addresses the problem. *See supra* text accompanying note 459.

601. Dellapenna, *supra* note 592. *See also* Symposium, *Safeguarding Our Water*, 284 SCI. AM. 38 (2001); Symposium, *Water Resources and Climate Change (Part I)*, 35 J. AM. WATER RESOURCES ASS'N 1297 (1999), Symposium, *Water Resources and Climate Change (Part II)*, 36 J. AM. WATER RESOURCES ASS'N 251 (2000); A. Dan Tarlock, *How Well Can International Water Allocation Regimes Adapt to Global Climate Change?*, 15 J. LAND USE & ENVTL. L. 423 (2000).

602. *See, e.g.*, MALONEY, AUSNESS, & MORRIS, *supra* note 40, at 72–75; Abrams, *supra* note 185, at 257–70; Ausness, *supra* note 138; Butler, *supra* note 43; Holczer, *supra* note 43; Looney, *Update*, *supra* note 185; Marlow, *supra* note 43; Rose, *supra* note 41; Carol M. Rose, *Energy and Efficiency in the Realignment of Common-Law Water Rights*, 19 J. LEGAL STUD. 261 (1990).

603. MALONEY, AUSNESS, & MORRIS, *supra* note 40, at 75–81; Robert H. Abrams, *Replacing Riparianism in the Twenty-First Century*, 36 WAYNE L. REV. 93, 97–98 (1989); Davis, *supra* note 138, at 453–56; Dellapenna, *supra* note 1, § 8.05. *See also* Pisani, *supra* note 50, at 15.

604. Dellapenna, *supra* note 80; Freyfogle, *supra* note 50, at 510–19; Carol M. Rose, *Property as the Keystone Right?*, 71 NOTRE DAME L. REV. 329 (1996). *See also* Howard Shelanski & Peter Klein, *Empirical Research in Transaction Cost Economics: A Review and Assessment*, 7 J. LAW & ECON. ORG. 335 (1995); Yoskowitz, *supra* note 181.

605. Beck, *supra* note 137; Dellapenna, *supra* note 10, § 9.03(a)(5)(D); Sherk, *supra* note 139.