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## State Coordination of Water Allocation Management and Water Pollution Regulation

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1993]

**STATE COORDINATION OF WATER ALLOCATION  
MANAGEMENT AND WATER POLLUTION  
REGULATION**

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## I. INTRODUCTION

An effective survey of water law must be grounded in hydrology, the science of water. Water in its various physical states comprises the hydrological cycle.<sup>1</sup> Atmospheric water condenses, hydrating the earth; in return, surface waters evaporate and recharge the atmosphere with water vapor, completing the cycle.<sup>2</sup> Interference with one part of the cycle can affect the entire system.<sup>3</sup> Due to this interdependent nature of the hydrological cycle, regulating water quantity and water quality are two essential components of water management.<sup>4</sup> Water quality affects the availability of water for many uses.<sup>5</sup> While it is obvious that polluted water is essentially unavailable for human consumption, other quantitative effects of low water quality are less apparent. For example, the volume of water needed to irrigate crops is proportional to the concentration of dissolved solids in the water.<sup>6</sup> Surprisingly, even water purification may have a negative impact on the availability of water by "remov[ing] water from its original watershed and transport[ing] it to a remote plant for treatment and disposal, thus reducing the amount of water available for recharge."<sup>7</sup> The above examples demonstrate that water quality and quantity can be as interdependent as condensation and evaporation.<sup>8</sup> Although some countries have recognized the necessity

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1. Every aspect of the hydrological cycle is interrelated as demonstrated by the following description: "Water, part of the hydrological cycle, falls to the earth as rain, flows over the land as diffused surface water, enters a surface watercourse or percolates into the soil, and becomes groundwater." Richard C. Ausness, *The Influence of the Model Water Code on Water Resources Management Policy in Florida*, 3 J. LAND USE & ENVTL. L. 1, 4 (1987).

2. *Id.*

3. *Id.* When surface water is contaminated, the pollutant frequently extends to the groundwater source. According to Ausness:

Surface water and groundwater are hydrologically linked so that interference with one may affect the other. Thus, if water is impounded in a reservoir, groundwater flow may increase in nearby areas. . . . Likewise, since surface water and groundwater are closely related, contamination of one often leads to degradation of the other within the same hydrological system.

*Id.* (footnotes omitted).

4. *Id.*

5. Ausness, *supra* note 1, at 4.

6. *Id.*

7. *Id.*

8. Anne W. Squier, *Water Quality Under Western Law: Water Quality, Water Quantity: The Reluctant Marriage*, 21 *Envtl. L.* 1081, 1082 (1991). As the author states, "[F]rom an economist's standpoint, water quality and quantity are inseparable — if you diminish the quality of water, it becomes a different economic good." *Id.*

Other examples of the interdependence of water quality and quantity

of integrating their water allocation and water pollution systems, "the results . . . have been inadequate"<sup>9</sup> because the coordination of quality and quantity in these countries has not been aggressive enough.

This study examines the integration of water management and pollution regulation systems in individual states. First, a classification model for state water systems is proposed. Second, a state by state analysis determines the degree of coordination between water allocation and pollution regulations systems. Finally, states are encouraged to adopt a holistic approach in the administration of water quality and quantity. Centralizing the authority over proposed uses and water pollution regulation would achieve the "holistic approach."

## II. BACKGROUND

Regardless of any unified vision of water management that may be suggested by the hydrological cycle, water allocation and water pollution have traditionally been treated as separate issues.<sup>10</sup> Water allocation systems have been classified in four categories: (1) riparianism, (2) prior appropriation, (3) dual systems, and (4) regulated riparianism.<sup>11</sup> Rights of action in water pollution management have evolved from common doctrines such as nuisance to recent statutory enactments regulating

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abound. The manner in which water is consumed can profoundly affect water quality. Ausness, *supra* note 1, at 4-5. Physically extracting water from a watercourse changes the total aggregate and water flow of a stream or river. Large withdrawals lower water levels and can potentially reduce the concentration of dissolved oxygen in the water, thereby impeding its capacity to absorb organic pollutants which can injure aquatic life. *Id.* Extraction of groundwater can also plausibly affect water quality. *Id.* In regions bordering the ocean, large groundwater withdrawals can cause salt water to flow further inland and supplant fresh water in the aquifer. *Id.* Additionally, many water uses change the physical or chemical nature of the water. *Id.* Therefore, when the water is returned to the aquifer, water quality is affected. For example, sewage created by municipal water systems changes the quality of the water returned to the watercourse. *Id.*

9. J.W. Maurits la Riviere, *Threats to the World's Water; Water Resource Management*, SCI. AM., Sept. 1989, at 80, 90. This commentator has noted that this is a global problem and has stated that "[s]ome management of water resources — of both their quantity and quality — is now widely practiced all over the world, but the results, particularly in quality control, have been inadequate. All signals point to further deterioration in the quality of fresh and marine waters unless aggressive management programs are instituted." *Id.* at 90.

10. George Vranesh, *The Historic Relationship of Water Quantity and Water Quality*, NAT. RESOURCES & ENV'T J., Winter 1986, at 3, 3.

11. See *1 WATERS AND WATER RIGHTS v* (Robert E. Beck ed., 2d ed. 1991).

water pollution.<sup>12</sup>

### A. Water Allocation Systems

Traditionally, states have controlled water use by adopting either the doctrine of riparianism or of prior appropriation.<sup>13</sup> The dominance of the riparianism doctrine in the eastern half of the nation reflects English common law influence over the American colonies.<sup>14</sup> However, riparianism is ill-adapted to environments like the western United States where water is neither abundant nor readily accessible.<sup>15</sup> While riparianism continues to regulate the water-rich east, it was destined to fail in the arid environment of the west.<sup>16</sup> The combination of the dry environment,<sup>17</sup> the tenuous influence of common law rules such as the riparian rights doctrine in territories of civil law origin,<sup>18</sup> and the substantial influence of nineteenth century gold mining camp water rights "laws"<sup>19</sup> led to the evolution of the doctrine of prior appropriation as the primary method of regulating water rights in the west.<sup>20</sup>

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12. See Robert E. Beck, *Introduction, History, and Overview*, in 5 WATERS AND WATER RIGHTS 133, 158 (Robert E. Beck ed., 2d ed. 1991).

13. See, e.g., George William Sherk, *Meetings of Waters: The Conceptual Confluence of Water Law in the Eastern and Western States*, NAT. RESOURCES & ENV'T J., Spring 1991, at 3, 3.

14. Arne M. Rovick, *What Water Quality Lawyers Should Know About Water Law*, NAT. RESOURCES & ENV'T J., Winter 1985, at 12, 12. American water law has its roots in the English system. "Early water law in the United States evolved from English common law. The topography and climate of the East Coast were similar to England's; therefore English common law was easily adapted to early American water needs." *Id.*

15. *Id.*

16. *Id.* See also Sherk, *supra* note 13, at 3.

17. Prior appropriation developed in the following manner:

The prior appropriation doctrine, the basic concept adopted in the western states for the allocation and management of water resources, reflects the realities of the region. . . . [T]hose realities produced a "drought-driven culture" in the western states. The "first-in-time is first-in-right" concept of the prior appropriation doctrine provides certainty in times of shortage.

Sherk, *supra* note 13, at 3.

18. See, e.g., *State v. Valmont Plantations*, 346 S.W.2d 853, 878 (Tex. Civ. App. 1961), *aff'd* 355 S.W.2d 502 (Tex. 1962) (relying on thorough review of colonial Spanish and Mexican water rights doctrines to deny plaintiff's claim of riparian rights for being alien to civil law tradition).

19. See John D. McGowen, *The Development of Political Institutions on the Public Domain*, 11 WYO. L.J. 1, 8-14 (1956). See also Joseph W. Dellapenna, *Dual Systems*, in 1 WATERS AND WATER RIGHTS 345, 352-54 (Robert E. Beck ed., 2d ed. 1991) [hereinafter *Dual Systems*].

20. See, e.g., Robert H. Abrams, *Replacing Riparianism in the Twenty-First Century*, 36 WAYNE L. REV. 93 (1989).

Joseph W. Dellapenna, Professor of Law at Villanova University School of Law, has proposed two additional classifications to describe water allocation systems in the United States: (1) dual systems; and (2) regulated riparian systems.<sup>21</sup> These classifications summarize the various responses of states to the inadequacies of the riparian and appropriation doctrines.<sup>22</sup> The dual system classification is prevalent in western states such as California where the prior appropriation doctrine has been adopted subsequent to the vesting of riparian rights.<sup>23</sup> Western states continue to recognize rights which originated under both systems.<sup>24</sup> In contrast, regulated riparianism, a doctrine primarily confined to eastern states, attempts to ameliorate the inadequacies of traditional riparianism.<sup>25</sup>

### 1. Riparian

Riparianism is based upon the principle that water rights "stem[] from the ownership of the land through which" water-courses flow.<sup>26</sup> The primary benefit of riparian ownership is the right to use water flowing across the land, although the riparian does not own the water itself.<sup>27</sup>

Two theories of riparianism define water usage limits.<sup>28</sup> According to the "natural flow theory," a riparian is entitled to the natural flow of water across his land without any reduction in quality or quantity.<sup>29</sup> Consequently, the "natural flow theory" is hostile to any development which depends upon exploitation of

21. *Dual Systems*, *supra* note 19, at 348-49; Joseph W. Dellapenna, *Regulated Riparianism*, in 1 *WATERS AND WATER RIGHTS* 413, 414-18 (Robert E. Beck ed., 2d ed. 1991) [hereinafter *Regulated Riparianism*].

22. *Dual Systems*, *supra* note 19, at 353; *Regulated Riparianism*, *supra* note 21, at 414.

23. *See Dual Systems*, *supra* note 19, at 354-55.

24. *Id.*

25. *Regulated Riparianism*, *supra* note 21, at 417.

26. RESTATEMENT (SECOND) OF TORTS ch. 41, topic 3 (1977). *See also* Joseph W. Dellapenna, *Introduction to Riparian Rights*, in 1 *WATERS AND WATER RIGHTS* 87 (Robert E. Beck ed., 2d ed. 1991) [hereinafter *Riparian Rights*].

27. Rovick, *supra* note 14, at 12. As stated by Rovick:

The fundamental principle of surface water rights — the riparian doctrine — is that each landowner bordering a river has some rights or privileges in maintaining the natural flow past his property. The riparian landowners do not have a right in or title to the flowing waters. They only have a right to use the water.

*Id.*

28. *See, e.g.*, RESTATEMENT (SECOND) OF TORTS ch. 41, topic 3 (1977).

29. Joseph W. Dellapenna, *The Right to Consume Water Under "Pure" Riparian Rights*, in 1 *WATERS AND WATER RIGHTS* 205, 233 (Robert E. Beck ed., 2d ed. 1991) [hereinafter *Water Consumption*]. The right to an undiminished natural

water resources. Meanwhile, the "reasonable use theory" limits riparian rights in an attempt to avoid over-consumption or under-consumption of the water source.<sup>30</sup> Reasonableness may be determined by the economic value of the use as measured by the value of any tangible products of the use. However, where economic measures are inappropriate, the necessity of the use may be considered.<sup>31</sup>

Riparian law also tends to distinguish between natural uses and artificial uses.<sup>32</sup> Generally, courts and legislatures have demonstrated a preference for natural uses.<sup>33</sup> In addition, some states encourage development of certain industries or forms of agriculture by granting them preferences over other users.<sup>34</sup>

## 2. *Prior Appropriation*

Beneficial use and priority of use are the two "cardinal principles" of the doctrine of prior appropriation.<sup>35</sup> The right to use water is not defined in terms of proximity to the source as in riparianism, but rather, "beneficial use of water is the basis of the right to use water."<sup>36</sup> Because there is no strict statutory definition,<sup>37</sup> beneficial use is susceptible to several interpretations,

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flow is generally qualified by the domestic use exception which provides higher priority to essential uses such as human consumption. *See id.* at 234.

30. *Id.* at 241. According to Dellapenna:

Under the reasonable use theory, each owner of riparian land is permitted to use the water in a water body, regardless of the effect the use has on the natural flow, so long as each user does not transgress the equal right of other riparians to use the water. . . . The only real restriction on use by any one riparian, then, is that a use cannot inflict a "substantial harm," or as courts more often say today, an "unreasonable injury," on any other riparian.

*Id.*

31. *Id.* at 251. *See also* Red River Roller Mills v. Wright, 15 N.W. 167 (Minn. 1883).

32. *Water Consumption*, *supra* note 29, at 229. Artificial uses include mining, manufacturing, generating power, commercial recreation, and irrigation for commercial agriculture. *Id.* *See also* Evans v. Merriweather, 4 Ill. (3 Scam.) 492 (1842).

33. *Water Consumption*, *supra* note 29, at 229-30. This preference is often demonstrated by exemptions from the permit requirements. *Id.* *See, e.g.*, KY. REV. STAT. ANN. § 151.140 (Michie/Bobbs-Merrill 1987).

34. *Water Consumption*, *supra* note 29, at 231-32.

35. RESTATEMENT (SECOND) OF TORTS ch. 41, topic 3 (1977).

36. *Id.*

37. *See, e.g.*, TEX. WATER CODE ANN. § 11.023 (West 1988) ("Purposes for Which Water May Be Appropriated"). Although statutes might enumerate beneficial uses which may serve as the basis for an appropriation, ambiguity of interpretation can be retained in the form of catch-all clauses which are directed at protecting unspecified beneficial uses. *See, e.g.*, TEX. WATER CODE ANN.

ranging from the most concrete economic justification to the most nebulous subjective preference.<sup>38</sup> When two beneficial uses conflict, water use is regulated by the principle of priority of use — the first in time is the first in right.<sup>39</sup> These universally accepted principles have been inconsistently applied by appropriation states. Traditionally, to acquire and maintain water rights, appropriators have been required to prove: “(1) [a]n intent to apply [the appropriation] to some existing or contemplated beneficial use; (2) an actual diversion from the natural channel by some mode sufficient for the purpose; and (3) an application of the water within a reasonable time to some beneficial use.”<sup>40</sup> However, more progressive authorities accept the substitution of beneficial in-stream uses for the traditional requirement of actual diversion. This substitution is effective as long as the in-stream use otherwise satisfies the cardinal principles of the doctrine.<sup>41</sup> Finally, most appropriation states currently require formal compliance with state law in the form of appropriation permits.<sup>42</sup> The formal compliance requirement has essentially merged with the intent requirement in that applying for an appropriation permit may satisfy both requirements.<sup>43</sup>

### 3. Dual Systems

Dual systems states recognize the existence of both riparian rights and appropriative rights.<sup>44</sup> These paradoxical systems have their genesis in the statutory or common law adoption of the

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§ 11.023(b) (“[s]tate water also may be stored, appropriated, or diverted for any other beneficial use.”).

38. See, e.g., *infra* notes 143, 197 and accompanying text.

39. RESTATEMENT (SECOND) OF TORTS ch. 41, topic 3 (1977). “[P]riority of use is the basis of the division of water between appropriators when there is not enough for all.” *Id.*

40. California Trout, Inc. v. State Water Resource Control Bd., 153 Cal. Rptr. 672, 676 (1979).

41. See, e.g., *id.* at 676 (Reynoso, J., dissenting) (“[T]he true test of an appropriative right is the successful application of the water to a beneficial use. . . . As elements of an appropriative right, diversion, possession, or physical control are then significant only insofar as they demonstrate that the water is to be put to beneficial use.”).

42. Joseph W. Dellapenna, 1 *Managing the Water Environment* 303 (1987) (unpublished Villanova University School of Law course materials).

43. *Id.*

44. *Dual Systems, supra* note 19, at 348-49. “Under the ‘Colorado doctrine’ riparian rights are not recognized in [some] western states . . . . Under the ‘California doctrine,’ riparian rights may co-exist with appropriative water rights.” Richard C. Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 WM. & MARY L. REV. 547, 548 n.4 (1983) [hereinafter *Water Reform*].



prior appropriation doctrine after the vesting of riparian rights under the prior law.<sup>45</sup> Rather than confiscating vested riparian rights, the dual systems states exempt these rights from confiscation and reallocation in the succeeding appropriative system. The exemption is valid as long as the riparian right was being beneficially used at the time of vesting.<sup>46</sup> Although vested riparian rights survive the conversion to an appropriative system, the essential incompatibility of the two schemes of water rights commonly results in extra limits being placed on riparian rights which tend to dilute their potency.<sup>47</sup>

#### 4. Regulated Riparianism

In some riparian doctrine states, dissatisfaction with the traditional water rights doctrine has resulted in the promulgation of "new laws that either amend or supersede the riparian doctrine."<sup>48</sup> These laws tend to incorporate "some aspects of the prior appropriation doctrine" into a system which remains predominately riparian.<sup>49</sup> The resulting system of "regulated riparianism" differs from pure riparianism by requiring direct users of water resources to obtain a permit from a state administrative agency.<sup>50</sup> The state permit statutes in regulated riparian systems often specify preferred uses which are exempted from permit requirements.<sup>51</sup> While preferences differ from state to state, domestic uses are generally given the highest priority.<sup>52</sup> In addition, many states also favor agricultural permit exemptions.<sup>53</sup>

Permit systems usually are administered by a single state agency.<sup>54</sup> These agencies often not only establish the terms to be met for approval of permits but also have the power to enforce

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45. *Dual Systems*, *supra* note 19, at 354-55. See also William R. Attwater & James Markle, *Overview of California Water Rights and Water Quality Law*, 19 PAC. L.J. 957 (1988).

46. Attwater & Markle, *supra* note 45, at 965.

47. *Water Reform*, *supra* note 44 (citing Frank J. Trelease, *Coordination of Riparian and Appropriative Rights to the Use of Water*, 33 TEX. L. REV. 24, 24-25 (1954)).

48. Sherk, *supra* note 13, at 3.

49. *Id.*

50. See *Regulated Riparianism*, *supra* note 21, at 444-46.

51. *Id.* at 455-62.

52. *Id.* at 455. For example, the priorities established by Arkansas are: "(1) domestic and municipal domestic supplies; (2) minimum stream flows; (3) federal water rights; (4) the sustaining of life; (5) the maintenance of health; and (6) the increase of wealth." ARK. CODE ANN. § 15-22-217(e) (Michie 1989).

53. *Regulated Riparianism*, *supra* note 21, at 455.

54. *Id.* at 468.

these conditions.<sup>55</sup>

## B. State and Federal Water Pollution Regulation

Prior to 1970, state and local governments had primary responsibility for environmental enforcement.<sup>56</sup> Historically, states have used common law tort actions to regulate water pollution.<sup>57</sup> Nuisance has been the foremost cause of action used to fight water pollution.<sup>58</sup> However, nuisance and other common law theories such as trespass, negligence, and strict liability for abnormally dangerous activities were inadequate to meet burgeoning environmental problems. The case-by-case approach was slow, burdensome, and a plaintiff's chance of recovery was uncertain and erratic.<sup>59</sup> In addition, the overall common law system posed additional problems. As one commentator noted:

The causation problems arising in tort-based environmental claims demonstrate that the courts are not equipped to handle as individual disputes what are really policy questions concerning the proper allocation of natural resources or other complex issues involving society's values, such as balancing employment or economic growth against the associated environmental impacts.<sup>60</sup>

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55. *Id.* at 469.

56. Hubert H. Humphrey, III & LeRoy C. Paddock, *The Federal and State Roles in Environmental Enforcement: A Proposal for a More Effective and More Efficient Relationship*, 14 HARV. ENVTL. L. REV. 7, 7 (1990) [hereinafter *Environmental Enforcement*].

57. Beck, *supra* note 12, at 158. See also Arnold W. Reitze, Jr., *Overview and Critique: A Century of Air Pollution Control Law: What's Worked; What's Failed; What Might Work*, 21 ENVTL. L. 1549, 1554 (1991). Common law tort remedies were the first legal mechanisms used to protect the environment. *Id.*

58. *Environmental Enforcement*, *supra* note 56, at 10. Private nuisance prohibits "substantial and unreasonable intrusions upon the use and enjoyment of another's property." *Id.* (quoting W. RODGERS, HANDBOOK ON ENVIRONMENTAL LAW 101 (1977)). A public nuisance is one affecting an interest common to all as compared to an interest unique to one or more individuals. *Id.* at 10 (citing W. PROSSER, LAW OF TORTS 585 (1971)). Historically, public nuisance has been used several times to abate water pollution problems. See, e.g., *State DEP v. Ventron Corp.*, 440 A.2d 455 (N.J. Super. Ct. App. Div. 1981), *aff'd in pertinent part, rev'd in part*, 468 A.2d 150 (N.J. 1983) (discharging mercury-contaminated waste into waterway creates liability for nuisance); *City of Scottsbluff v. Winters Creek Canal Co.*, 53 N.W.2d 543 (Neb. 1952) (recognizing that open irrigation ditch may constitute action for nuisance under some circumstances); *Berger v. Minneapolis Gaslight Co.*, 62 N.W. 336 (Minn. 1895) (escape of petroleum from storage tank into groundwater).

59. Vranesh, *supra* note 10, at 5. See also *Environmental Enforcement*, *supra* note 56, at 12. Recovery under the case-by-case approach was too unpredictable to cope with the increasing number of pollution problems. *Id.*

60. Reitze, *supra* note 57, at 1559. Even if recovery were permitted, courts

Although these common law causes of action still exist today,<sup>61</sup> federal and state regulatory schemes are currently the primary water pollution and environmental enforcement mechanisms.<sup>62</sup> Currently, all fifty states have statutes regulating water pollution. These statutes set water quality standards in conjunction with the federal water quality policies mandated by the Clean Water Act (CWA).<sup>63</sup> The enactment of the CWA has dramatically altered the direction of water pollution control.<sup>64</sup> The CWA sets water quality standards for effluent limitations on discharges into navigable waters.<sup>65</sup> Furthermore, the CWA establishes the National Pollutant Discharge Elimination System (NPDES). NPDES permits must be obtained for all point source discharges into "waters of the United States."<sup>66</sup> This term has been interpreted broadly to include almost any free-flowing watercourse in the United States.<sup>67</sup>

The Environmental Protection Agency (EPA) is responsible for the issuance of NPDES permits within each state unless it has specifically delegated this responsibility to the respective state environmental agency.<sup>68</sup> The emphasis of this study is on the state pollution statutes and regulations. A consideration of the federal water pollution regulation scheme is beyond the scope of this study. However the federal government is an important actor because of its heavy involvement in regulating water pollution within each state.

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frequently limited relief to that "necessary to prevent known injury to accepted uses of water." *Id.* Additionally, the courts often balanced the social utility of the plaintiff and defendant in their determinations. *Id.*

61. James A. Liability, *Public Nuisance: A Common Law Remedy Among the Statutes*, 5 NAT. RESOURCES & ENV'T J. 29, 30 (1990). Liability suggests that public nuisance can fill the gaps in current federal and state regulatory systems. *Id.* at 29.

62. *Id.*

63. CWA §§ 101-607, 33 U.S.C. §§ 1251-1387 (1977).

64. *See* CWA § 301, 33 U.S.C. § 1311.

65. *Id.*

66. CWA § 401, 33 U.S.C. § 1341.

67. *See generally* United States v. Riverside Baysview Homes, Inc., 474 U.S. 121 (1985).

68. CWA § 301, 33 U.S.C. § 1311. EPA will delegate this responsibility to the state if the state can show that it has sufficient authority "[t]o abate violations of the permit or the permit program, including civil and criminal penalties and other ways and means of enforcement." CWA § 402(b)(7), 33 U.S.C. § 1342(b)(7).

### III. PROPOSED MODEL FOR CLASSIFICATION OF STATE WATER ALLOCATION AND POLLUTION MANAGEMENT

A survey of respective water quantity and water quality regimes of the several states reveals a relatively consistent pattern of regulation in this country. This pattern is expressed in the following proposed state water allocation and pollution management model. The perceived similarities and differences between the various state systems suggests a model containing three classes of water management systems. Each class is defined by the extent of interaction between water allocation management and water pollution regulation. In order of decreasing interaction, these classifications have been designated: (A) the unified water management system; (B) the coordinated water management system; and (C) the disjunctive water management system.

#### A. The Unified Water Management System

Unified water management states employ a single agency to administer water quantity and water quality. Also within this classification are states which delegate these matters to more than one agency, provided that the agencies are not divided along the lines of water quantity and water quality. It is feasible for states using three of the four water allocation systems to achieve some degree of unified water management. However, pure riparian states cannot logically fit within this classification because riparian water allocation is, by definition, not centrally administered.

#### B. The Coordinated Water Management System

Coordinated water management states exhibit a lesser degree of administrative integration than unified states. Coordinated water management systems mandate some consultation between otherwise independent or interrelated agencies whose authority is, to some extent, divided between quantity and quality. As with unified water management, three of the four water allocation systems may be associated with a coordinated system. The only exception is pure riparianism which lacks agencies to coordinate the two systems.

#### C. The Disjunctive Water Management System

Disjunctive water management systems lack meaningful integration of water allocation and water pollution management. By definition, traditional riparian rights states are disjunctive in their

overall water management. Disjunctive systems are also found in states possessing administrative integration in limited geographic areas (e.g., a designated wildlife preserve).

#### IV. APPLICATION OF MODEL TO STATE SURVEY

##### A. Unified Water Management States

###### 1. *Riparian*

As previously mentioned in the discussion of the analytical model, it is theoretically impossible for a riparian state to employ a unified water management system. Riparian systems possess no state agency with broad water allocation authority.

###### 2. *Prior Appropriation*

No states fit within this category.

###### 3. *Dual Systems*

###### a. *California*

California is a "dual system" state based on the principles of riparian water rights and prior appropriation.<sup>69</sup> Pursuant to the Water Commission Act, water rights acquired after 1914 are administered by the State Water Resources Control Board (SWRCB).<sup>70</sup> As a result of "the realization that decisions affecting water quality and water rights were inseparable, the SWRCB was created."<sup>71</sup>

Water pollution is regulated by the Porter-Cologne Water Quality Control Act, a comprehensive statute dedicated to the protection of water quality.<sup>72</sup> The Act regulates discharges into ground and surface water.<sup>73</sup> The SWRCB<sup>74</sup> implements the Act

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69. Attwater & Markle, *supra* note 45, at 959-60. The California Supreme Court established that both prior appropriation and riparian rights would govern California water law. *Lux v. Hagin*, 10 P. 674 (Cal. 1886). However, the State Water Resources Control Board (SWRCB) has the power to prioritize current uses over unexercised riparian rights. See *In re Waters of Long Valley Creek Stream Sys.*, 599 P.2d 656, 668 (Cal. 1979).

70. CAL. WATER CODE § 1610 (West 1971). See Attwater & Markle, *supra* note 45, at 981.

71. Attwater & Markle, *supra* note 45, at 996 n.158. See also GAVIN M. CRAIG, CALIFORNIA WATER LAW IN PERSPECTIVE LXXXIV (West 1971). SWRCB was created to integrate the two functions of regulating water quality and quantity. Thus, the quality of affected waters is examined whenever new water appropriations are approved. *Id.*

72. CAL. WATER CODE § 174 (West 1971).

73. See Attwater & Markle, *supra* note 45, at 994.

74. The SWRCB controls nine regional water quality control boards that

by administering the issuance of water permits<sup>75</sup> and by creating water quality control plans for each of their regions.<sup>76</sup>

The SWRCB regulates both water pollution and water usage in California. The agency also systematically coordinates water quantity and quality by issuing discharge and consumptive use permits.

*b. South Dakota*

South Dakota employs a dual water allocation system which recognizes the prior appropriation and riparian rights doctrines for both surface water<sup>77</sup> and groundwater.<sup>78</sup>

South Dakota employs a unified water management system in which the state Water Management Board regulates both water quantity and water quality. Water quality is controlled through appropriation permits.<sup>79</sup> South Dakota's system has been described as having "integrate[d] environmental regulation with regulation of water rights."<sup>80</sup>

*c. Texas*

Texas regulates surface water usage by employing a dual system utilizing the doctrines of prior appropriation and riparian rights.<sup>81</sup> In this system, the common law rule of capture applies to groundwater use.<sup>82</sup> The Texas Water Commission (TWC) is authorized to issue water allocation permits.<sup>83</sup>

TWC is authorized to regulate water pollution<sup>84</sup> as well as water allocation matters.<sup>85</sup> The Natural Resource Conservation

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directly create regional guidelines and implement the act. CAL. WATER CODE § 13200 (West 1971).

75. Attwater & Markle, *supra* note 45, at 997.

76. *Id.* at 998. The plans seek to protect beneficial uses and prevent nuisances. *Id.*

77. S.D. CODIFIED LAWS ANN. §§ 46-1-1 to -9 (1986 & Supp. 1991).

78. *Id.*

79. S.D. CODIFIED LAWS ANN. § 34A-2-36 (1986 & Supp. 1991).

80. John H. Davidson, *South Dakota*, in 6 WATERS AND WATER RIGHTS 387, 393 (Robert E. Beck ed., 2d ed. 1991).

81. *See* Texas Water Rights Adjudication Act, TEX. WATER CODE ANN. §§ 11.301-.341 (West 1988).

82. *City of Sherman v. Public Util. Comm'n*, 643 S.W.2d 681 (Tex. 1983).

83. TEX. WATER CODE ANN. § 11.135.

84. TEX. WATER CODE ANN. § 26.011 (West 1988 & Supp. 1992).

85. TEX. WATER CODE ANN. § 5.013 (West 1988 & Supp. 1992). The water commission has "general jurisdiction" over the state's water quantity program "including the issuance of water rights permits, water rights adjudication, cancellation of water rights, and enforcement of water rights . . . [and] the state's

Commission (NRCC) is the "principal authority . . . on matters relating to the quality of water."<sup>86</sup> TWC and other agencies with general jurisdiction over water quality "shall coordinate" their activities with those of NRCC.<sup>87</sup> Although Texas water management is within the purview of several agencies, the quantity and quality jurisdiction of TWC and the duty to coordinate these issues with other agencies makes it a unified system.

*d. Washington*

Washington employs a dual water allocation system which recognizes the prior appropriation and riparian rights doctrines for surface waters.<sup>88</sup> The prior appropriation<sup>89</sup> doctrine also applies to groundwater. However, the reasonable correlative rights doctrine is still viable with respect to statutorily exempted uses of groundwater.<sup>90</sup>

The Department of Ecology (DE) is charged with integrating Washington's water quality and quantity management.<sup>91</sup> DE is authorized to issue appropriation permits.<sup>92</sup>

*4. Regulated Riparianism*

*a. Delaware*

Delaware is a regulated riparian state.<sup>93</sup> The Department of Natural Resources and Environmental Control (DNREC) issues

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water quality program including issuance of permits, enforcement of water quality rules, standards, orders, and permits, and water quality planning." *Id.*

86. TEX. WATER CODE ANN. § 26.127 (West 1988).

87. *Id.*

88. WASH. REV. CODE ANN. § 90.03.010 (West 1962 & Supp. 1992). The statute provides in part that "[s]ubject to existing rights all waters within the state . . . shall be hereafter acquired only by appropriation for a beneficial use . . . ." *Id.*

89. *Id.*

90. *State v. Ponten*, 463 P.2d 150 (Wash. 1969).

91. WASH. REV. CODE ANN. § 43.21A.020 (West 1983). The statute provides in pertinent part:

It is the purpose of this chapter to establish a single state agency with the authority to manage and develop our air and water resources in an orderly, efficient, and effective manner and to carry out a coordinated program of pollution control involving these and related land resources. To this end a department of ecology is created by this chapter to undertake, in an integrated manner, the various water regulation, management, planning and development programs now authorized to be performed by the department of water resources and the water pollution control commission.

*Id.*

92. WASH. REV. CODE ANN. § 90.03.250 (West 1962 & Supp. 1992).

93. DEL. CODE ANN. tit. 7, § 6001 (1991). A permit must be obtained for

permits to applicants who meet DNREC's standards.<sup>94</sup> Permits are issued to applicants based upon a showing of reasonable beneficial use.<sup>95</sup> The common goal of DNREC is to equitably apportion water among beneficial users while preserving water as a natural resource.<sup>96</sup> Delaware regulates water pollution pursuant to the Delaware Water Pollution Control Laws. These laws are promulgated and enforced by DNREC.<sup>97</sup> Additionally, the agency creates statewide water quality standards.<sup>98</sup> DNREC may levy fines of up to \$10,000 per day for violations of these standards.<sup>99</sup>

DNREC regulates water pollution and provides for the allocation of water in Delaware. Even though the same administrative agency administers the two systems, Delaware does not have any specific statutory regulations coordinating the two systems. Therefore, Delaware's water system is coordinated only to the degree that DNREC is involved with the system's administration.

#### b. Connecticut

Connecticut is a regulated riparian state. Water is distributed pursuant to the Water Diversion Policy Act.<sup>100</sup> The Act, administered by the Connecticut Department of Environmental Protection (DEP), requires users to obtain a DEP approved permit.<sup>101</sup> In order to obtain a water use permit, the applicant must provide DEP with information concerning the effect of the proposed diversion on water quality.<sup>102</sup>

DEP also executes the Connecticut Water Pollution Control

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any activity "which may cause or contribute to the withdrawal of groundwater or surface water, or both." DEL. CODE ANN. tit. 7, § 6003(a)(3)(6) (1991).

94. DEL. CODE ANN. tit. 7, § 6003(a)(3)(6).

95. Charles M. Allmond, *Delaware*, in 6 WATERS AND WATER RIGHTS 82 (Robert E. Beck ed., 2d ed. 1991).

96. *Id.*

97. DEL. CODE ANN. tit. 7, §§ 6005, 6010. The Secretary of the department is directed to "develop, implement, enforce, and may amend, modify and repeal, a state pretreatment program in compliance with the Federal Water Pollution Control Act . . . ." DEL. CODE ANN. tit. 7, § 6033.

98. DEL. CODE ANN. tit. 7, § 6205(c).

99. DEL. CODE ANN. tit. 7, § 6142(b)(1).

100. CONN. GEN. STAT. §§ 22a-365 to -378 (1985 & Supp. 1991).

101. CONN. GEN. STAT. § 22a-366. The permit must be found necessary and compatible with long-range water resources planning, proper management, and use of water resources. *Id.*

102. CONN. GEN. STAT. § 22a-368. The permit must also provide information about the need for the diversion, the quantity needed, alternatives, and costs. *Id.*



Act.<sup>103</sup> The Act mandates that the DEP commissioner promulgate comprehensive programs to control the pollution of Connecticut's waters.<sup>104</sup> Throughout this process, the commissioner consults with other state agencies and affected groups.<sup>105</sup>

DEP administers both pollution regulation and water usage in Connecticut. In issuing usage water permits DEP considers water quality issues. In this role, DEP balances quality and quantity to some degree.

c. *Florida*

Florida is a regulated riparian state. Water quantity is distributed pursuant to the Water Resources Act of 1972.<sup>106</sup> The Act is administered by five regional districts under the supervision of the Florida Department of Environmental Regulation (DER).<sup>107</sup> To establish a valid water use in Florida, an applicant must obtain a permit from a regional district.<sup>108</sup> Water pollution is also regulated by DER.<sup>109</sup> Before any party can discharge effluent into Florida's waters, a permit must first be obtained from DER.<sup>110</sup> To receive a permit, applicants must provide "reasonable assurances" that their discharges will not violate water quality standards.<sup>111</sup> Florida recently merged the coordination of quality and quantity issues under the same agency. This merger resulted from an acknowledgement that the two systems were

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103. CONN. GEN. STAT. § 22a-424 (1985).

104. CONN. GEN. STAT. § 22a-424(b).

105. CONN. GEN. STAT. § 22a-424(c).

106. FLA. STAT. ANN. §§ 373.013-.619 (West 1985 & Supp. 1991). One commentator has stated: "The act provides for the diverse complexity and magnitude of water resource problems in different areas of Florida by creating five independently functioning water management districts." Donna R. Christie, *Florida*, in 6 WATERS AND WATER RIGHTS 87 (Robert E. Beck ed., 2d ed. 1991).

107. FLA. STAT. ANN. § 373.026(1). Ausness has noted that, "[t]he water management districts have shown considerable imagination and initiative in their responses to particular water management concerns. For example, several of the districts have enacted well-spacing regulations to protect against salt water intrusion." Ausness, *supra* note 1, at 25.

108. FLA. STAT. ANN. § 373.223. Consumptive use permits are issued by water management districts for "reasonable beneficial" uses of water that are "consistent with the public interest." *Id.*

109. FLA. STAT. ANN. § 403.021 (West 1985 & Supp. 1991). Any installation that might be expected to be a source of pollution is required to obtain a permit from DER. FLA. STAT. ANN. § 403.087. DER will not issue the permit until it determines that the installation has control facilities adequate enough to meet Florida water quality standards. FLA. STAT. ANN. § 403.087(4).

110. FLA. STAT. ANN. § 403.088.

111. *Id.*

interrelated.<sup>112</sup>

*d. Iowa*

Iowa is a regulated riparian state. Water is allocated by way of a permit system administered by the Department of Natural Resources (DNR).<sup>113</sup> Only individuals withdrawing more than 25,000 gallons of water per day are required to obtain permits.<sup>114</sup> The permit system considers “measures . . . necessary to ensure long-term availability [of water] in terms of quantity and quality to preserve public health and welfare.”<sup>115</sup> Iowa controls and regulates pollution within the state pursuant to both the Iowa Environmental Quality Act<sup>116</sup> and the Groundwater Protection Act.<sup>117</sup> The Environmental Quality Act authorizes the commissioner of DNR to promulgate water quality standards.<sup>118</sup> In creating or modifying these standards, the commissioner must consider the proposed changes’ effect upon water usage.<sup>119</sup>

Iowa DNR controls both water allocation and pollution regulation. DNR is to consider the proposed water use before ad-

112. *But see* James S. Wershow, *Water Management: The Future of Florida Legal Implications*, 51 FLA. B.J. 136, 141 (1977). Wershow describes the Florida system as follows: “The statutory bifurcation of function - DER’s water quality control and the water management districts water quantity and flow control - overlooks the fact that such functions are not always mutually exclusive.” *Id.* This statutory separation causes confusion among potential permit applicants, reduces expediency, and increases administrative costs. *Id.* It causes disputes as to the jurisdiction of the water districts in dealing with water quality issues in determining whether a permit will be granted. *Id.* It does not specifically allow the water districts administering the permit process to take qualitative issues into consideration. *Id.*

*See also* Ausness, *supra* note 1, at 27. The water districts’ lack of authority over water pollution issues has caused problems because states cannot effectively separate water quality and quantity issues at the implementation level. *Id.* However, it must be noted that although the districts do not have direct responsibility over pollution, they do consider water quality in issuing permits. *Id.* Ausness suggests that DER also delegate water pollution permitting to the districts because they have the financial and technical expertise to administer these permits. *Id.* at 31. He also recommends as a possible solution, that DER develop a plan to insure that water quality is administered uniformly by DER and the water management districts. *Id.* at 30-31.

113. IOWA CODE ANN. § 455B.269 (West 1990). *See generally* Eric J. Tabor, Note, *A Proposal for a Regulated Market of Water Rights in Iowa*, 65 IOWA L. REV. 979 (1980).

114. IOWA CODE ANN. § 455B.268(1).

115. IOWA CODE ANN. § 455B.262(3).

116. IOWA CODE ANN. §§ 455B.171-.246 (West 1990 & Supp. 1991).

117. IOWA CODE ANN. §§ 455E.1-.11 (West 1990 & Supp. 1991).

118. IOWA CODE ANN. § 455B.173(1) (West 1990 & Supp. 1991).

119. IOWA CODE ANN. § 455B.176(4) (West 1990 & Supp. 1991).

ministering or creating pollution regulations. This guideline loosely coordinates water quality and quantity.

*e. Kentucky*

Kentucky allocates its water resources according to the principles of regulated riparianism.<sup>120</sup> A party wishing to divert or withdraw public waters<sup>121</sup> must obtain a permit from the Department of Natural Resources and Environmental Protection.<sup>122</sup>

The Department of Natural Resources and Environmental Protection cabinet is also responsible for overseeing statewide pollution control.<sup>123</sup> Among the department's responsibilities is to prepare a comprehensive pollution control plan.<sup>124</sup> Parties must obtain a permit in order to discharge pollutants into the Commonwealth's waters.<sup>125</sup> The Environmental Quality Commission has an advisory role in setting and reviewing environmental policy.<sup>126</sup> Coordination between water allocation and pollution control is unified because both functions are controlled by the Department of Natural Resources and Environmental Protection.

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120. *Fackler v. Cincinnati, N.O. & T.P. Co.*, 17 S.W.2d 194 (Ky. 1929).

121. KY. REV. STAT. ANN. § 151.120 (Michie/Bobbs-Merrill 1987). The Kentucky statute includes the following bodies of water in its definition of public waters:

Water occurring in any stream, lake, or ground water, subterranean water or other body of water in the Commonwealth which may be applied to any useful and beneficial purpose is hereby declared to be a natural resource and public water of the Commonwealth and subject to control or regulation for the public welfare . . . .

*Id.*

122. KY. REV. STAT. ANN. § 151.40. The statute does not require a permit for domestic uses, irrigation, agriculture, or for amounts of water that do not exceed state regulations. *Id.* Kentucky states its water policy as:

The conservation, development, and proper use of the water resources of the Commonwealth of Kentucky have become of vital importance as a result of population expansion and concentration, industrial growth, technological advances, and an ever increasing demand for water for varied domestic, industrial, municipal, agricultural, and recreational uses of water. . . . Therefore, it is declared the policy of the Commonwealth to actively encourage and to provide financial, technical, or other support for projects that will control and store our water resources in order that the continued growth and development of the Commonwealth might be assured.

KY. REV. STAT. ANN. § 151.114 (Michie/Bobbs-Merrill Supp. 1990).

123. KY. REV. STAT. ANN. § 224.10-010 (Michie/Bobbs-Merrill 1991).

124. KY. REV. STAT. ANN. § 224.10-100(2).

125. KY. REV. STAT. ANN. § 224.10-100(19)(a).

126. KY. REV. STAT. ANN. § 224.01-110.

*f. New Jersey*

New Jersey allocates water resources according to a system of regulated riparianism.<sup>127</sup> Parties wishing to divert more than 100,000 gallons per day must obtain a permit from the Department of Environmental Protection.<sup>128</sup> Parties having the right to divert over 100,000 gallons prior to the passage of the Water Supply Management Act<sup>129</sup> must obtain new permits.<sup>130</sup>

Water pollution is controlled by the Department of Environmental Protection.<sup>131</sup> By granting permits, the Department regulates the discharge of pollutants into New Jersey waters.<sup>132</sup> Coordination of water allocation and pollution control is unified, because the Department of Environmental Protection is responsible for granting both water diversion permits and discharge permits.

*g. Virginia*

Virginia allocates surface waters through a regulated riparian rights system.<sup>133</sup> Groundwater use is regulated by the Ground Water Act.<sup>134</sup> Commentators have noted the inconsistencies in the statutory scheme for water resource management.<sup>135</sup>

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127. N.J. STAT. ANN. § 58:1A-1 (West 1982 & Supp. 1991). The stated purpose of the legislation is to give the Department of Environmental Protection the power to "manage the water supply." *Id.*

128. N.J. STAT. ANN. § 58:1A-7.

129. N.J. STAT. ANN. §§ 58:1A-1 to -17.

130. N.J. STAT. ANN. § 58:1A-6(a)(1). The statute reads in pertinent part: Persons having or claiming a right to divert more than 100,000 gallons of water per day pursuant to prior legislative or administrative action, including persons previously exempted from the requirement to obtain a permit, shall renew that right by applying for a permit, or water usage certification, as the case may be, within 180 days of the effective date of this act.

*Id.* See also Matter of Water Supply Critical Area No. 2, 558 A.2d 1321 (N.J. 1989) (Water Supply Management Act didn't give Department of Environmental Protection authority to order holder of diversion permit to reduce water use unless Governor declared water emergency pursuant to § 58:1A-4 and, therefore, order to reduce water use was invalid).

131. N.J. STAT. ANN. § 58:10A-1 (West 1982 & Supp. 1991).

132. N.J. STAT. ANN. § 58:10A-6.

133. See, e.g., VA. CODE ANN. § 62.1-44.15:5 (Michie Supp. 1991).

134. VA. CODE ANN. §§ 62.1-44.83 to .105 (Michie 1987).

135. VA. CODE ANN. §§ 62.1-44.2 to .34:12 (Michie 1987 & Supp. 1991).

One commentator has described Virginia water law in the following manner: Enacted on an ad hoc basis without any serious attempt to integrate them with one another, these amendments are scattered throughout the Virginia Code and delegate various types of duties and responsibilities to eleven different state agencies. . . . Because the agencies tend to focus only on a particular aspect of a water resource problem and gen-

The State Water Control Law purports to regulate the quality and quantity of the waters through the Water Control Board.<sup>136</sup>

## B. Coordinated Water Management States

### 1. *Riparian*

As mentioned in the preceding discussion of the analytical model, it is theoretically impossible for a riparian state to employ a coordinated water management system. Riparian systems lack the central water allocation agencies necessary to coordinate water allocation and water pollution management.

### 2. *Prior Appropriation*

#### a. *Colorado*

Colorado is a prior appropriation state. Water is allocated pursuant to principles enumerated in the Water Rights and Determination Act.<sup>137</sup> Prior appropriation is administered by water judges in seven divisions of the state.<sup>138</sup> The Water Rights and Determination Act "recogniz[es] the need to correlate the activities of mankind with some reasonable preservation of the environment."<sup>139</sup> Under this Act, water judges are to consider water quality issues in determining the validity of proposed water usages. However, the Department of Health administers Colorado's chief pollution regulating statute, the Colorado Water Quality Control Act.<sup>140</sup> Consequently, there is minimal coordination among the quality and quantity systems in Colorado.

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erally have separate jurisdictional powers, little coordination occurs between the various agencies. When this situation is combined with the independent power that local political units have over the resources within their boundaries, a confusing and uncertain system for managing Virginia's water resources results.

Lynda L. Butler, *Allocating Consumptive Water Rights in a Riparian Jurisdiction: Defining the Relationship Between Public and Private Interests*, 47 U. PITT. L. REV. 95, 100 n.11 (1985).

136. VA. CODE ANN. § 62.1-44.2. (Michie 1987).

137. COLO. REV. STAT. § 37-92-102(a)(1) (1990). The doctrine of prior appropriation is also adopted constitutionally. COLO. CONST. art. XVI, §§ 5-6.

138. COLO. REV. STAT. § 37-92-201(1). The Water Courts, presided over by one district court judge in each division, have exclusive jurisdiction over water matters. COLO. REV. STAT. § 37-92-203(1).

139. COLO. REV. STAT. § 37-92-102(3).

140. COLO. REV. STAT. § 25-8-102 (1990). It is the state's policy to maximize the beneficial use of Colorado water and to achieve the "maximum practical degree" of water quality. COLO. REV. STAT. § 25-8-102(2).

*b. Mississippi*

Mississippi is a prior appropriation state.<sup>141</sup> A potential user must apply to the state Permit Board.<sup>142</sup> The permits are granted for beneficial uses, a broadly defined term.<sup>143</sup> Both surface water and groundwater are considered property of the state.<sup>144</sup>

Mississippi's system provides for considerable coordination and integration between water allocation and pollution control. The Commission on Environmental Quality oversees the Department of Environmental Quality.<sup>145</sup> The Bureau of Land and Water Resources and the Bureau of Pollution Control are under the jurisdiction of the Department of Environmental Quality.<sup>146</sup> The Department of Health also has some responsibility for pollution control because it sets standards for drinking water and home wastewater systems.<sup>147</sup>

*c. Utah*

Utah is a prior appropriation jurisdiction with respect to sur-

141. Al Sage, *Mississippi*, in 6 *WATERS AND WATER RIGHTS* 225 (Robert E. Beck ed., 2d ed. 1991). See MISS. CODE ANN. § 51-3-5 (1989). Domestic uses are exempted from the permit requirement. MISS. CODE ANN. § 51-3-7(1).

142. MISS. CODE ANN. § 51-3-5. According to the statute: "[N]o person who is not specifically exempted by this chapter shall use water without having first obtained a permit as provided herein . . . ." *Id.*

143. Sage, *supra* note 141, at 226. The statute defines beneficial use as "the application of water to a useful purpose as determined by the Commission, but excluding waste of water." MISS. CODE ANN. § 51-3-3(e).

144. MISS. CODE ANN. § 51-3-1. Mississippi claims that all water within the state is state property. According to the statute:

All water, whether occurring on the surface of the ground or underneath the surface of the ground, is hereby declared to be among the basic resources of this state to therefore belong to the people of this state and is subject to regulation in accordance with the provisions of this chapter. The control and development and use of water for all beneficial purposes shall be in the state, which, in the exercise of its police powers, shall take such measures to effectively and efficiently manage, protect, and utilize the water resources of Mississippi.

*Id.*

145. Sage, *supra* note 141, at 226. See MISS. CODE ANN. § 49-2-6 (1989).

146. Sage, *supra* note 141, at 226. See MISS. CODE ANN. § 49-2-7. According to the statute, "[t]he department shall be responsible for conserving, managing, developing and protecting the natural resources of the State [sic] of Mississippi within the jurisdiction of the department. . . . The department shall coordinate all functions of state government related to natural resources within the jurisdiction of the department." *Id.*

147. Sage, *supra* note 141, at 232.

face water<sup>148</sup> and groundwater.<sup>149</sup> Water appropriation permits are issued by approval of the State Engineer.<sup>150</sup>

The Water Development Coordinating Council is designed to facilitate a comprehensive approach to water quality and quantity by coordinating interaction between agencies with narrower focuses such as the Division of Water Resources, the Water Quality Board, and the Drinking Water Board.<sup>151</sup>

### 3. Dual Systems

#### a. North Dakota

North Dakota employs a dual water allocation system which recognizes both the prior appropriation<sup>152</sup> and riparian rights<sup>153</sup> doctrines for surface water and groundwater. The State Water Engineer issues water appropriation permits.<sup>154</sup>

The Water Pollution Control Board of the Department of Health (WPCB) is authorized to regulate "new or existing pollution" of North Dakota waters.<sup>155</sup> WPCB regulates water pollution by issuing water pollution permits.<sup>156</sup> WPCB is required to cooperate with the state Water Commission in "formulat[ing] and issu[ing] standards of water quality and classification of water according to its most beneficial uses."<sup>157</sup>

#### b. Oklahoma

Oklahoma currently employs a dual system which allocates surface water based upon the reasonable use riparian doctrine<sup>158</sup> and the prior appropriation doctrine.<sup>159</sup> Groundwater use is regulated pursuant to the Oklahoma Groundwater Law by the

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148. UTAH CODE ANN. § 73-3-1 (1991). The code provides: "The appropriation must be for some useful and beneficial purpose, and, as between appropriators, the one first in time shall be the one first in rights . . ." *Id.*

149. *Id.* "[A]ll waters in this state, whether above or under the ground" are subject to appropriation. *Id.*

150. UTAH CODE ANN. § 73-3-8.

151. UTAH CODE ANN. § 73-10c-3.

152. See N.D. CENT. CODE §§ 61-04-01 to -32 (1985 & Supp. 1991).

153. See, e.g., *Sturt v. Beck*, 133 U.S. 541 (1890).

154. N.D. CENT. CODE § 61-04-02.

155. N.D. CENT. CODE § 61-28-04(2).

156. N.D. CENT. CODE § 61-28-04(18), (19).

157. N.D. CENT. CODE § 61-28-04(15).

158. *Smith v. Stanolind Oil & Gas Co.*, 172 P.2d 1002 (Okla. 1946).

159. OKLA. STAT. ANN. tit. 82, § 105.2 (West 1990). See also Gary D. Allison, *Oklahoma*, in 6 WATERS AND WATER RIGHTS 339, 340 (Robert E. Beck ed., 2d ed. 1991).

Oklahoma Water Resources Board (OWRB).<sup>160</sup> This law provides that surface landowners or lessees own underlying waters but must obtain a permit for non-domestic uses.<sup>161</sup> OWRB also issues surface water appropriation permits.<sup>162</sup>

Water pollution regulation is administered by eight agencies. These agencies include an overarching body, the Pollution Control Coordinating Board, as well as OWRB, which regulates water allocation.<sup>163</sup>

*c. Wisconsin*

Wisconsin employs a dual water allocation system based upon the prior appropriation and riparian rights doctrines for surface waters.<sup>164</sup> Groundwater use is subject to reasonable correlative rights.<sup>165</sup>

The Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) has primary responsibility for water quality issues. DATCP's enabling statute requires that the agency "shall coordinate its . . . water conservation program with" the various water quality programs "and other programs with objectives related to soil and water conservation administered by [itself] or by other state or federal agencies."<sup>166</sup>

*4. Regulated Riparianism*

No states fit within this category.

**C. Disjunctive Water Management States**

*1. Riparian*

*a. Alabama*

Alabama regulates water allocation under the riparian reasonable use doctrine.<sup>167</sup> This system is administered by the state

160. OKLA. STAT. ANN. tit. 82, §§ 1020.1-.22 (West 1990 & Supp. 1992).

161. OKLA. STAT. ANN. tit. 82, §§ 1020.1-.3.

162. OKLA. STAT. ANN. tit. 82, § 105.12 (West 1990).

163. See Allison, *supra* note 159, at 348. The other six agencies are: (1) the Environmental Services Division of the State Department of Health, (2) the Conservation Commission, (3) the Corporation Commission, (4) the Department of Mines, (5) the Department of Agriculture, and (6) the Department of Wildlife Conservation. *Id.*

164. Michael J. Cain, *Wisconsin*, in 6 WATERS AND WATER RIGHTS 469 (Robert E. Beck ed., 2d ed. 1991).

165. *State v. Michels Pipeline Constr., Inc.*, 217 N.W.2d 339 (Wis. 1974).

166. WIS. STAT. ANN. § 92.05 (West 1990).

167. *Ulbricht v. Eufala*, 6 So. 78, 79 (Ala. 1889). The court stated:



courts. Water pollution is regulated pursuant to the Alabama Control Act.<sup>168</sup>

The only coordination of pollution and water distribution is injunctive relief granted by suing another water user in court. This allocation mechanism cannot effectively manage the entire water management system because it does not deal with the problems of water quality and quantity on a system-wide basis.

*b. Arkansas*

Arkansas allocates water through riparian reasonable use principles.<sup>169</sup> The Determination of Water Use Requirements Act moderately modifies this judicially administered system.<sup>170</sup> The Act requires the Arkansas Soil and Water Conservation Commission to catalog surface water supplies,<sup>171</sup> ascertain the surface water needs of fish and wildlife,<sup>172</sup> and determine the amount of water needed for public water supplies.<sup>173</sup>

Pollution is controlled by the Arkansas Water and Air Pollution Control Act which is administered by the Department of Pollution Control and Ecology.<sup>174</sup> Although water pollution and water distribution are coordinated separately, the Determination

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"[T]here is no principle of law better recognized than that every riparian owner of lands, through which streams of water flow, has a right to the reasonable use of the running water, which is a private right of property." *Id.* See *supra* notes 30-34 and accompanying text for a discussion of riparian reasonable use doctrine. See generally Harry Cohen, *Water Law in Alabama - A Comparative Survey*, 24 ALA. L. REV. 453 (1972).

168. See Alabama Water Pollution Control Act, ALA. CODE §§ 22-22-1 to -14 (1990). The Alabama Department of Environmental Management is responsible for administering the Act through the Alabama Water Improvement Commission. ALA. CODE § 22-22-9(a). It is the duty of the Commission to control pollution in the waters of the state. ALA. CODE § 22-22-9(a). In fulfilling this goal, the Commission is to cooperate with other state agencies, ALA. CODE § 22-22-9(a)(3), in its mission to conserve the waters of the state and protecting the quality of water. ALA. CODE § 22-22-2.

169. *Harris v. Brooks*, 283 So.2d 129, 133 (Ark. 1955).

170. See J.W. Looney, *An Update on Arkansas Water Law: Is the Riparian Doctrine Dead?*, 43 ARK. L. REV. 573, 579 (1990). The Soil and Water Conservation Commission administers the Act. ARK. CODE ANN. § 15-22-301 (Michie 1987). The statute states: "The Commission shall: (1) Inventory the Surface Resources and Underground Water Resources within this state; (2) Determine the surface water requirements for fish and wildlife; . . . (6) Determine the water needs for industry." *Id.* The commission must develop guidelines for surface and groundwater use. *Id.*

171. ARK. CODE ANN. § 15-22-301(1).

172. ARK. CODE ANN. § 15-22-301(2).

173. ARK. CODE ANN. § 15-22-301(5). The commission has also been given the power to allocate water in times of shortage. *Id.*

174. ARK. CODE ANN. § 8-4-207 (Michie 1987 & Supp. 1991).

of Water Use Requirements Act considers the distributive effect on water quality in creating its guidelines.<sup>175</sup>

*c. Georgia*

Georgia combines the natural flow<sup>176</sup> and reasonable use theories<sup>177</sup> with statutory regulation of groundwater.<sup>178</sup> The natural flow doctrine is modified by the principles of reasonable use.<sup>179</sup> A riparian landowner is allowed the reasonable use of water. However, this right is subject to a landholder's right "to have the stream pass over his land according to its natural flow, subject to such disturbances, interruptions, and diminutions . . . on account of the reasonable use . . . of it by other riparian proprietors."<sup>180</sup>

Pollution is regulated by the Department of Environmental Regulation pursuant to the Georgia Water Quality Control Act.<sup>181</sup> The department not only apportions surface water withdrawals exceeding 100,000 gallons per day<sup>182</sup> but also issues groundwater permits.<sup>183</sup> There is no structural coordination of water quality and quantity in Georgia.

*d. Hawaii*

Hawaii employs a unique water management system based upon a statute conferring riparian rights on its inhabitants.<sup>184</sup> Permits are issued by the Commission on Water Resource Management.<sup>185</sup> However, permits are only issued if the current water usages threaten to diminish water quality. If water quality is threatened, the Commission can designate a water management area "establishing administrative control over the withdraw-

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175. ARK. CODE ANN. § 15-22-301 (Michie 1987). However, this act does not regulate a significant portion of the water in the state.

176. GA. CODE ANN. § 44-8-1 (Michie 1982).

177. GA. CODE ANN. § 51-9-7 (Michie 1982).

178. Groundwater Use Act, GA. CODE ANN. § 12-5-90 (Michie 1988).

179. Pyle v. Gilbert, 265 S.E.2d 584, 587 (Ga. 1980).

180. *Id.* (quoting Price v. High Shoals Mfg. Co., 64 S.E. 87, 88 (Ga. 1909)).

181. GA. CODE ANN. § 12-5-20 to -53 (Michie 1988).

182. GA. CODE ANN. § 12-5-31.

183. GA. CODE ANN. § 12-5-96(a) (Michie 1988). As part of its responsibilities, the Department of Natural Resources also operates state parks and other facilities thereby causing it to violate some of the environmental regulations it is supposed to enforce. James L. Bross, *Georgia, in 6 WATERS AND WATER RIGHTS* 97, 100 (Robert E. Beck ed., 2d ed. 1991).

184. HAW. REV. STAT. § 7-1 (1985). See also Douglas W. MacDougal, *Testing the Current Water Code and the Regulation of Hawaii's Water Resources*, 10 U. HAW. L. REV. 205, 210 (1988).

185. HAW. REV. STAT. § 174C-53 (Supp. 1991).

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als and diversions of ground and surface waters in the area . . . .”<sup>186</sup> Once the Commission designates such an area, all existing and new uses must be registered and users must obtain a permit from the Commission.<sup>187</sup> Permits for new uses are judged more stringently than those issued for existing uses.<sup>188</sup> The use must be a “reasonable-beneficial” use, congruous with the “public interest,” it must not “interfere with any existing legal use of water” and the water source must be able to “accommodate” the suggested use.<sup>189</sup>

Although designated areas are established by the Commission on Water Resource Management when water quality is threatened, the establishment and general enforcement of water quality standards are delegated to the Hawaii Department of Health.<sup>190</sup> Therefore, there is a lack of statutory coordination between quantity and quality issues in Hawaii’s promulgation of water quality standards.

*e. Illinois*

The riparian reasonable use doctrine determines the allocation of surface water<sup>191</sup> and groundwater in Illinois.<sup>192</sup> Pollution control is governed by the Illinois Environmental Protection Act and is administered by EPA and the Pollution Control Board.<sup>193</sup> There exists some coordination between water quantity and quality through judicial riparian decisions<sup>194</sup> and common law nuisance statutes.<sup>195</sup>

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186. HAW. REV. STAT. § 174C-41(a) (Supp. 1991).

187. HAW. REV. STAT. § 174C-48(a) (Supp. 1991).

188. HAW. REV. STAT. § 174C-49 (Supp. 1991).

189. *Id.*

190. Hawaii Pollution Control Laws, HAW. REV. STAT. § 342D-1 (Supp. 1990).

191. *Evans v. Merriweather*, 4 Ill. (3 Scam.) 492, 495 (1842).

192. Water Use Act of 1983, ILL. REV. STAT. ch. 5, para. 1604(f) (1992). Reasonable use is defined as “the use of water to meet natural wants and a fair share for artificial wants.” ILL. REV. STAT. ch. 5, para. 1604(g).

193. ILL. REV. STAT. ch. 111 1/2, para. 1005, 1006 (1988). The Pollution Control Board consists of seven technically qualified members. ILL. REV. STAT. ch. 111 1/2, para. 1005(a). The Board is to establish environmental control standards. *Id.*

194. *See Fenwick v. Bluebird Coal Co.*, 140 N.E.2d 129, 131 (Ill. App. Ct. 1957).

195. ILL. REV. STAT. ch. 100 1/2, para. 26(3) (1987). A public nuisance “corrupt[s] or render[s] unwholesome or impure the water of any spring, river, stream, pond or lake, or to the injury or prejudice of others.” *Id.*

*f. Indiana*

Indiana allocates water using riparian reasonable use principles.<sup>196</sup> Reasonable use is interpreted as "the use of water for a beneficial use in such quantity and manner as is necessary for economic and efficient utilization and is both reasonable and consistent with the public interest."<sup>197</sup> The Indiana Department of Environmental Management is responsible for dealing with water pollution problems through the Water Pollution Control Board.<sup>198</sup> The majority of water allocation in Indiana is judicial. Therefore, there may be some coordination through riparian decisions.

*g. Louisiana*

Regarding the allocation of surface water, Louisiana is a riparian rights state.<sup>199</sup> Although the riparian landowner does not own the water, the landowner has use of it and may limit or deny use or withdrawal of the water by nonriparians.<sup>200</sup> In contrast, groundwater is allocated in accord with the English Rule or the

196. IND. CODE § 13-2-6.1-1 (1990). Groundwater is regulated under the Emergency Groundwater Rights Act, IND. CODE §§ 13-2-2.5-2 to 13-2-2.5-6 (1990 & Supp. 1992). The Act is administered by the Department of Natural Resources. IND. CODE § 4-21.5-3-4(a)(5) (Supp. 1992).

197. IND. CODE § 13-2-6.1-1. Water must also be put to a beneficial use. Beneficial use is defined as "the use of water for any useful and productive purpose and includes, but is not limited to, domestic, agricultural (including irrigation), industrial, commercial, power generation, energy conversion, public water supply, waste assimilation, navigation, fish and wildlife, and recreational uses." *Id.*

198. IND. CODE § 13-7-1 (1990).

199. Patrick H. Martin, *Louisiana*, in 6 WATERS AND WATER RIGHTS 171, 171 (Robert E. Beck ed., 2d ed. 1991).

200. *Id.* at 172. See LA. CIV. CODE. ANN. art. 657 (West 1980). Although the riparian owner may prevent nonriparians from withdrawing or using water, there is some doubt concerning the extent of the riparian's rights against the public and other riparians. Judges have considerable influence over the policies by which water is allocated. As one commentator has stated:

A riparian owner may not exclude the public use of the running water or the use of water by other riparians. He may not exhaust the supply of the water, make the water unsuitable for the use of the public or other riparians, obstruct the flow, or take such quantities of water that other riparians are likely to sustain damages. If he does so, he is answerable to damages and injunction. In this respect courts enjoy much discretion for the resolution of disputes and accommodation of conflicting interests.

Martin, *supra* note 199, at 173 (quoting 4 A. YIANNPOULOS, LOUISIANA CIVIL LAW TREATISE, PREDIAL SERVITUDES § 22 (1983)).

Therefore, while riparian owners are accorded special privileges under the law, they do not possess the right to selfishly squander water resources.

principle of absolute ownership.<sup>201</sup> Water allocation must also be in accord with the public trust doctrine. Thus, the water use must be consistent with the best interests of the state's citizens.<sup>202</sup>

Pollution control is shared by many different local and state agencies.<sup>203</sup> The most important agency is the Department of Environmental Quality.<sup>204</sup> Other agencies are responsible for various areas and programs throughout the state.<sup>205</sup> The Department of Natural Resources also has an important impact on the quality of Louisiana waters.<sup>206</sup>

There is a limited amount of coordination between water allocation and water pollution agencies. Those who wish to drill water wells must obtain a permit from the Department of Transportation and Development.<sup>207</sup>

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201. Martin, *supra* note 199, at 173. In addition, Louisiana apparently treats subterranean waters as if they were oil or gas. *Id.* at 174. Landowners may withdraw water from their own land even if this process withdraws water from neighboring lands. *Id.* See The Louisiana Mineral Code, LA. REV. STAT. ANN. § 31:8 (West 1989 & Supp. 1992). The statute reads in pertinent part that a landowner 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." *Id.*

However, Louisiana courts have interpreted the law so that a party may be liable for negligent or intentional damage to neighboring property. See *Adams v. Grigsby*, 152 So. 2d 619 (La. Ct. App.), *cert. denied*, 153 So.2d 880 (La. 1963).

202. Martin, *supra* note 199, at 175. The Louisiana Supreme Court has recognized and applied a broad interpretation of the public trust doctrine. According to the Court:

A public trust for the protection, conservation and replenishment of all natural resources of the state was recognized by art. VI, § 1 of the 1921 Louisiana Constitution. The public trust doctrine was continued by the 1974 Louisiana Constitution, which specifically lists air and water as natural resources, commands protection, conservation and replenishment of them insofar as possible and consistent with health, safety and welfare of the people, and mandates the legislature to enact laws to implement this policy.

*Id.* (citing *Save Ourselves, Inc., v. Louisiana Env'tl. Control Comm'n*, 452 So.2d 1152, 1154 (La. 1984)).

203. Martin, *supra* note 199, at 176-77.

204. *Id.* at 177. The Department is responsible for protecting "water quality." LA. REV. STAT. ANN. § 36:231 (West 1985 & Supp. 1992). Within the Department, the Office of Water Resources is responsible for administering and enforcing water regulations and controls. LA. REV. STAT. ANN. § 36:238C (West 1985).

205. Martin, *supra* note 199, at 177. The Department of Transportation and Development is responsible for flood and drainage control, reclamation, water resources, and soil conservation. LA. REV. STAT. ANN. § 36:507C (West Supp. 1992).

206. Martin, *supra* note 199, at 177.

207. *Id.* See LA. REV. STAT. ANN. § 38:3098A (West 1989 & Supp. 1992). In the interest of protecting public health, the Department has prepared extensive

*h. Maine*

Maine allocates its water resources according to the principles of riparianism and reasonable use.<sup>208</sup> In determining whether a use is reasonable, Maine gives consideration to the use's effects on water quality and quantity.<sup>209</sup> Allocation of groundwater is rooted in the "English Rule" of capture and absolute ownership.<sup>210</sup> Although the Maine allocation system is founded in case law, some statutory reforms have been made.<sup>211</sup> However, strict limits on the transportation or transfer of water beyond the water source have been legislated.<sup>212</sup>

Maine has comprehensive water pollution regulation.<sup>213</sup> The state is concerned with meeting or exceeding federal pollution re-

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regulations for the location, drilling, and operation of water wells. Martin, *supra* note 199, at 177 (citing DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT, WATER WELL RULES, REGULATIONS, AND STANDARDS (1985)).

208. Orlando E. Delogu, *Maine*, in 6 WATERS AND WATER RIGHTS 181, 181 (Robert E. Beck ed., 2d ed. 1991). Delogu suggests that the current state of Maine law is directly linked to the history and the geography of the state:

Maine's water law, owing to the fact that there has been organized commercial and community interests in what was originally the Province of Mayne [sic] that predated the Plymouth Colony charter of 1620 and the Massachusetts Bay Colony charter of 1629 . . . is steeped in the English common-law doctrines of natural law, natural use, and natural flow. These doctrines for pragmatic and economic reasons in the colonies . . . gradually gave way to the doctrines of riparianism and reasonable use. Moreover, the physical conditions out of which riparianism grew—an abundance of rainfall, snowmelt, a variety of water resources—lakes, rivers, streams, groundwater supplies, vast reaches of ocean foreshore all existed historically, and continue to exist, in Maine.

*Id.*

209. See *Lockwood v. Lawrence*, 77 Me. 297 (1885) (downstream plaintiffs obtained injunction against upstream operators of several lumber mills for unreasonably diminishing quality of water by polluting water with waste from mills).

210. Delogu, *supra* note 208, at 185. See *Chase v. Silverstone*, 62 Me. 175 (1873). The defendant dug a well on his property and diverted the water from his neighbor's spring, making it necessary for the plaintiff to install a pump in order to draw water from the spring. The court ruled this was a *damnum absque injuria* (wrong for which law would give no redress). *Id.*

211. Delogu, *supra* note 208, at 186. See Ground Water Protection Program, ME. REV. STAT. ANN. tit. 38, §§ 401-404 (West 1989 & Supp. 1991). According to the statute, "a person is liable for the withdrawal of ground water when the withdrawal is in excess of beneficial domestic use for a single-family home and when the withdrawal causes interference with the preexisting beneficial domestic use of ground water by a landowner or lawful land occupant." ME. REV. STAT. ANN. tit. 38, § 404 (West 1989).

212. ME. REV. STAT. ANN. tit. 22, §§ 2660-2660A (West 1990). The statute provides for exceptions such as hospital use, portable toilets, well drilling, construction, swimming pool filling, fire fighting, aquaculture, agriculture, concrete mixing, and civil emergencies. ME. REV. STAT. ANN. tit. 22, § 2260A-(2).

213. Delogu, *supra* note 208, at 188.

quirements.<sup>214</sup> Of particular interest is the state's effort to protect "outstanding rivers."<sup>215</sup> As a riparian state, water allocation and pollution coordination is limited in Maine.

*i. Maryland*

Allocation of water resources, both surface and groundwater, are controlled in Maryland by the reasonable use doctrine.<sup>216</sup> A potential user must usually obtain a permit from the Water Resources Administration of the Maryland Department of Natural Resources.<sup>217</sup> There are exceptions for domestic uses and limited agricultural purposes.<sup>218</sup> During water emergencies, water allocation and use is limited by priorities set by statute.<sup>219</sup> A permit is also required if the subdivision of land will require the appropriation of state waters.<sup>220</sup>

Responsibility for water pollution control programs is shared by two state agencies.<sup>221</sup> The Maryland Department of the Environment is responsible for the administration of the NPDES according to the standards of the CWA.<sup>222</sup> The Maryland Department of Natural Resources is responsible for enforcing state wetlands laws.<sup>223</sup>

There is some coordination between water allocation and water pollution in Maryland. The main area of shared responsibility and effort is in the area of wetlands protection and

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214. *Id.* See ME. REV. STAT. ANN. tit. 38, §§ 411-424, 464-469, 491-501 (West 1989 & Supp. 1991).

215. ME. REV. STAT. ANN. tit. 12, §§ 401-407 (West Supp. 1991). This statute focuses upon the problems competing uses pose to historic or scenic rivers. Its goal is to address these problems through comprehensive resource management plans. ME. REV. STAT. ANN. tit. 12, § 407.

216. Scott Burns, *Maryland*, in 6 WATERS AND WATER RIGHTS 191 (Robert E. Beck ed., 2d ed. 1991). See *Finley v. Teeter Stone, Inc.*, 248 A.2d 106 (Md. 1967).

217. MD. NAT. RES. CODE ANN. §§ 8-801 to -814 (1990 & Supp. 1992).

218. MD. NAT. RES. CODE ANN. § 8-802(b) (1990 & Supp. 1992). Agricultural uses do not require a permit if they consume less than 10,000 gallons of water per day. *Id.*

219. MD. NAT. RES. CODE ANN. § 8-802(d) (1990). In an emergency, domestic and municipal uses are superior to agricultural users. Agricultural users have priority over all other uses. *Id.*

220. MD. REGS. CODE § 8.05.02.03A(3) (1990 & Supp. 1992).

221. Burns, *supra* note 216, at 193.

222. MD. ENVIR. CODE ANN. §§ 4-401 to -405 & 9-301 to -348 (1987).

223. Burns, *supra* note 216, at 194. Maryland requires different permits for tidal and non-tidal wetlands. *Id.* For provisions concerning tidal wetlands, see MD. NAT. RES. CODE ANN. § 9-101 to -603 (1990 & Supp. 1992). For the permit requirements for nontidal wetlands, see MD. NAT. RES. CODE ANN. § 8-1201 to -1211 (1990 & Supp. 1992).

preservation.<sup>224</sup>

*j. Michigan*

Water allocation in Michigan is guided by the principles of riparian rights coupled with the reasonable use doctrine.<sup>225</sup> In addition, the public's right to use navigable streams and lakes affects the rights of riparian owners.<sup>226</sup> There are two classifications of riparian uses: (1) natural purposes and (2) artificial purposes.<sup>227</sup> Two agencies are responsible for pollution control.<sup>228</sup> Any party may maintain an action seeking relief against a polluter.<sup>229</sup> Coordination between water allocation and pollution is limited.<sup>230</sup>

*k. Minnesota*

Minnesota has a riparian system limited by the doctrine of reasonable use.<sup>231</sup> Riparian uses are divided into the categories of stream flow, consumptive uses, and permanent improvements such as docks and filling.<sup>232</sup> Riparian rights may be separated from ownership of riparian land.<sup>233</sup> A permit from the Depart-

224. See note 223 and accompanying text.

225. Veryl N. Meyers, *Michigan*, in 6 *WATERS AND WATER RIGHTS* 205 (Robert E. Beck ed., 2d ed. 1991).

226. *Id.* See *Collins v. Gerhardt*, 211 N.W. 115 (Mich. 1926) (riparian rights are subject to public's rights of reasonable use for navigation, boating, etc.).

227. Meyers, *supra* note 225, at 207. See *Thompson v. Enz*, 154 N.W.2d 473 (Mich. 1967) (artificial uses are defined as those uses that increase prosperity or comfort of user such as commercial or recreational use).

228. Meyers, *supra* note 225, at 212. Michigan divides pollution control between the Water Resources Commission and the Department of Natural Resources. MICH. COMP. LAWS §§ 323.1-.13 (1975 & Supp. 1992). The Attorney General has the responsibility of enforcing the Michigan Environmental Response Act. MICH. COMP. LAWS § 299.601 (1984 & Supp. 1992).

229. Thomas J. Anderson, Gordon Rockwell Environmental Protection Act of 1970, MICH. COMP. LAWS §§ 691.1201-.1207 (1987 & Supp. 1992). The statute allows the attorney general, state and local agencies, corporations, associations, persons, and any other legal entity to bring suit against polluters or those likely to violate the law. MICH. COMP. LAWS § 691.1202(2)(1) (1987 & Supp. 1992).

230. MICH. COMP. LAWS §§ 281.761-.776 (1979 & Supp. 1992). If the state designates a river as a "natural river area," the Natural Resources Commission may adopt plans and encourage zoning that will protect the integrity of the waters. MICH. COMP. LAWS § 281.768 (1979 & Supp. 1992).

231. Kenneth Salzberg, *Minnesota*, in 6 *Waters and Water Rights* 215, 215 (Robert E. Beck ed., 2d ed. 1991).

232. *Id.*

233. *Nelson v. DeLong*, 7 N.W.2d 342, 346 (Minn. 1942). The court stated: "Rights in the shore line and submerged lands along the lake shore may be separated and dissociated from littoral or riparian lands and transferred to and enjoyed by persons having no interest in the original riparian estate." *Id.*



ment of Natural Resources is required to pump groundwater, but this requirement seems to be tempered by a general respect for the rights of landowners to pump water from their own property.<sup>234</sup>

Water pollution is controlled by the Department of Natural Resources and the Pollution Control Agency.<sup>235</sup> Although there is some coordination between groundwater allocation and water pollution through the comprehensive authority of the Department of Natural Resources, surface water allocation remains unregulated.

*l. Missouri*

Missouri is a pure riparian system that has no permit requirements.<sup>236</sup> However, uses of surface water or groundwater that exceed an average of 100,000 gallons per day must be registered with the Department of Natural Resources.<sup>237</sup> Groundwater is allocated according to the comparative reasonable use doctrine.<sup>238</sup>

Water pollution control is the responsibility of the Missouri Clean Water Commission.<sup>239</sup> The Commission operates under the authority of the Department of Natural Resources.<sup>240</sup> The Commission is also responsible for the issuance, revocation, modification, or denial of permits for the discharge of pollutants into the state's water.<sup>241</sup> Although the Commission is authorized to advise, consult, and cooperate with other state agencies in order to facilitate enforcement of pollution laws,<sup>242</sup> coordination between water allocation and pollution control is limited.

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234. Salzberg, *supra* note 231, at 220. A groundwater user must receive a permit if more than 10,000 gallons per day or 1,000,000 gallons per year are to be withdrawn. MINN. R. 6115.0600 (1991).

235. Salzberg, *supra* note 231, at 222.

236. Peter N. Davis, *Missouri*, in 6 WATERS AND WATER RIGHTS 237, 237 (Robert E. Beck ed., 2d ed. 1991). See *Bollinger v. Henry*, 375 S.W.2d 161 (Mo. 1964).

237. MO. ANN. STAT. §§ 256.400-410 (Vernon 1990). The remedy of injunction may be used against a large unregistered diversion of water. MO. ANN. STAT. § 256.415 (Vernon 1990).

238. Davis, *supra* note 236, at 239-40. See *Higday v. Nickolaus*, 469 S.W.2d 859, 869-70 (Mo. Ct. App. 1971) (discussion of legal classification of groundwater into categories of underground streams and percolating waters).

239. MO. ANN. STAT. § 644.026 (Vernon 1988).

240. MO. ANN. STAT. § 644.021.

241. MO. ANN. STAT. § 644.026(13).

242. MO. ANN. STAT. § 204.026(3) (Vernon 1983).

*m. New Hampshire*

New Hampshire allocates water using the riparian reasonable use doctrine.<sup>243</sup> Reasonable use is construed as the consistent and fair apportionment of water rights among all riparian owners.<sup>244</sup>

Pollution is regulated by the Water Pollution Supply and Control Division (WPSCD) of the Department of Environmental Services.<sup>245</sup> There is no interaction between pollution regulation and water allocation in the state.

*n. New York*

New York allocates water resources according to the riparian reasonable use doctrine.<sup>246</sup> Surface waters in the state are subject to the public trust doctrine.<sup>247</sup>

New York has comprehensive water pollution control.<sup>248</sup> Discretionary requests to use water must be accompanied by an environmental assessment form filed with the Department of Environmental Conservation (DEC).<sup>249</sup> Although the state seems to allocate water according to reasonable use riparian principles, the DEC's influence over discretionary uses indicates a considerable degree of coordination between water allocation and pollution control for certain uses.<sup>250</sup>

*o. Ohio*

Ohio is a reasonable use riparian rights jurisdiction for surface water<sup>251</sup> and groundwater.<sup>252</sup> Water pollution regulation is administered by the Ohio Environmental Protection Agency

243. See *Bassett v. Salisbury Mfg. Co.*, 43 N.H. 569 (1862).

244. *Gillis v. Chase*, 31 A.2d 18 (N.H. 1891).

245. Anne E. Renner, *New Hampshire*, in 6 WATERS AND WATER RIGHTS, 277, 285 (Robert E. Beck ed., 2d ed. 1991).

246. Nicholas A. Robinson, *New York*, in 6 WATERS AND WATER RIGHTS 297, 297 (Robert E. Beck ed., 2d ed. 1991).

247. *Id.* at 298. See also *Granger v. City of Canandaigua*, 177 N.E. 394 (N.Y. 1931) (lakes); *Fulton Light, Heat, & Power Co. v. New York*, 94 N.E. 199 (N.Y. 1911) (rivers); *People v. New York & Staten Island Ferry Co.*, 68 N.Y. 71 (1877) (tidelands).

248. Robinson, *supra* note 246, at 297-302.

249. *Id.* at 298. See N.Y. ENVTL. CONSERV. LAW § 8-0109 (McKinney 1984); 6 N.Y. COMP. CODES R. & REGS. tit. 6, § 615 (1990).

250. Robinson, *supra*, note 246, at 300-02.

251. *Cooper v. Williams*, 4 Ohio 253 (1831), *aff'd on reh'g*, 5 Ohio 391 (1832).

252. *Cline v. American Aggregates Corp.*, 474 N.E.2d 324 (Ohio 1984). See also OHIO REV. CODE ANN. § 1521.17(B) (Anderson Supp. 1991).

(OEPA).<sup>253</sup> OEPA's enabling statute also provides authority to administer comprehensive water resource management planning.<sup>254</sup>

*p. Pennsylvania*

Pennsylvania is a reasonable use riparian rights jurisdiction for both surface water<sup>255</sup> and groundwater.<sup>256</sup>

Several laws regulate water pollution in Pennsylvania. These regulations include the Pennsylvania Clean Streams Law<sup>257</sup> and the Pennsylvania Safe Drinking Water Act.<sup>258</sup> In addition to agency management of water quality, the courts tolerate only reasonable pollution of surface waters.<sup>259</sup> Groundwater pollution "has been analyzed in terms of ordinary tort law rather than in terms of property concepts."<sup>260</sup>

*q. Rhode Island*

Rhode Island has retained the traditional water allocation doctrine of natural flow riparianism for surface water.<sup>261</sup> The Rhode Island Department of Environmental Management (RIDEM) has authority (which may go unexercised)<sup>262</sup> to manage water quantity and quality.<sup>263</sup> Groundwater polluters are also subject to tort liability if their actions were negligent or willful.<sup>264</sup>

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253. OHIO REV. CODE ANN. § 3745.01 (Anderson 1992). The Ohio Code provides in part: "The [OEPA] shall . . . administer the laws pertaining to . . . the prevention, control, and abatement of air and water pollution; public water supply; comprehensive water resource management planning; and the disposal and treatment of solid wastes, infectious wastes, construction and demolition debris, hazardous waste, sewage, industrial waste, and other wastes." *Id.*

254. *Id.*

255. *Brown v. Kistler*, 42 A. 885 (Pa. 1899); *Alburger v. Philadelphia Elec. Co.*, 535 A.2d 729 (Pa. Commw. Ct. 1988).

256. *Burr v. Adam Eidemiller, Inc.*, 126 A.2d 403 (Pa. 1956).

257. PA. STAT. ANN. tit. 35, §§ 691.1-.1001 (1977 & Supp. 1991).

258. PA. STAT. ANN. tit. 35, §§ 721.1-.17 (Supp. 1991).

259. Joseph W. Dellapenna, *Pennsylvania*, in 6 *Waters and Water Rights* 363, 370 (Robert E. Beck ed., 2d ed. 1991).

260. *Id.*

261. *Hood v. Slefkin*, 143 A.2d 683 (R.I. 1958).

262. Dennis Binder, *Rhode Island*, in 6 *WATERS AND WATER RIGHTS* 373, 373 (Robert E. Beck ed., 2d ed. 1991). Binder has described Rhode Island's water system in the following manner: "Unlike most states, Rhode Island lacks a well-developed body of statutory water rights. Instead, it relies extensively upon common-law principles." *Id.*

263. R.I. GEN. LAWS § 42-17.1-2 (1988 & Supp. 1991). The director of RIDEM "shall . . . supervise and control the protection, development, planning, and utilization of . . . water . . ." *Id.*

264. R.I. GEN. LAWS § 46-12-21 (1991).

r. *South Carolina*

Surface water use in South Carolina is subject to the reasonable use riparian rights doctrine.<sup>265</sup> Groundwater is regulated by the Groundwater Use Act which authorizes the state's Water Resources Commission (WRC) to regulate groundwater use in especially sensitive locations.<sup>266</sup>

The South Carolina Department of Health and Environmental Control administers the Pollution Control Act.<sup>267</sup> The WRC is the agency which has primary responsibility for coordinating water quality and quantity management.<sup>268</sup>

s. *Tennessee*

Tennessee is a riparian state for both surface water<sup>269</sup> and groundwater.<sup>270</sup> The Water Quality Control Board (WQCB) is the agency charged with regulating water pollution.<sup>271</sup> There is no coordination with water allocation management because there is "no direct statutory or common-law direction regarding water conservation."<sup>272</sup>

t. *Vermont*

Surface water use in Vermont is subject to the reasonable use riparian rights doctrine.<sup>273</sup> The doctrine of reasonable use has been codified for application to groundwater use.<sup>274</sup>

Water pollution regulation and, to some extent, water use regulation, are under the auspices of the Water Resources Board

265. *White v. Whitney Mfg. Co.*, 38 S.E. 456 (S.C. 1901).

266. S.C. CODE ANN. §§ 49-5-10 to -130 (Law. Co-op. 1987 & Supp. 1991).

267. S.C. CODE ANN. § 48-1-10 (Law. Co-op. 1987).

268. See S.C. CODE ANN. §§ 49-3-30 to -50 (Law. Co-op 1987 & Supp. 1991).

269. *Nashville, Chatt. & St. L. Ry. v. Rickert*, 89 S.W.2d 889 (Tenn. Ct. App. 1936).

270. *Id.*

271. TENN. CODE ANN. §§ 69-3-101 to -105 (1987 & Supp. 1991).

272. James E. Thompson, *Tennessee*, in 6 WATERS AND WATER RIGHTS 397, 403 (Robert E. Beck ed., 2d ed. 1991). See also TENN. CODE ANN. § 69-8-102 (1987). According to the statute:

The director of the water resources division shall be responsible . . . for the general direction of all matters . . . looking toward the creation and development of a basic, long range water resource policy for the state, with the exception of the functions relating to the water pollution control exercised by the Tennessee water pollution control board . . . .

*Id.*

273. *Martin v. Bigelow*, 2 Aik. 184 (Vt. 1827).

274. VT. STAT. ANN. tit. 10, § 1410 (Supp. 1991).

(WRB).<sup>275</sup> WRB is directed to manage “the water resources of the state” through “classification of the waters of the state, [and] establishment of water quality standards, rules governing surface levels of lakes and ponds, rules regulating the surface use of public waters and rules establishing pollution charges.”<sup>276</sup>

*u. West Virginia*

West Virginia applies the reasonable use riparian rights doctrine to surface water use.<sup>277</sup> Groundwater use is limited by the doctrine of reasonable correlative rights.<sup>278</sup>

The Water Resources Board has been provided “jurisdiction and supervision [of] the administration and enforcement of all laws relating to . . . the conservation, development, protection, enjoyment and use of the water resources of the State.”<sup>279</sup> However, one authority asserts that there is no agency with comprehensive powers at present, therefore water pollution regulation is handled through several agencies, which often administer projects with contrary purposes.<sup>280</sup>

2. *Prior Appropriation*

*a. Alaska*

Alaska regulates water use through prior appropriation principles<sup>281</sup> set forth in the Water Use Act.<sup>282</sup> A water right is acquired by obtaining a permit from the Alaska Department of Natural Resources (ADNR).<sup>283</sup> In appropriating water, the com-

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275. VT. STAT. ANN. tit. 10, § 905 (1984 & Supp. 1991).

276. *Id.*

277. *Gaston v. Mace*, 10 S.E. 60 (W. Va. 1889).

278. *Pence v. Carney*, 52 S.E. 702 (W. Va. 1905).

279. W. VA. CODE § 20-5-1 (1989).

280. Patrick McGinley, *West Virginia*, in 6 WATERS AND WATER RIGHTS 461, 466-67 (Robert E. Beck ed., 2d ed. 1991).

281. ALASKA CONST. art. VIII, § 13. “Priority of appropriation shall give prior right.” *Id.*

282. ALASKA STAT. §§ 46.15.010-.270 (1991). The Water Use Act “recognize[s] the unity of the hydrological cycle by putting all water in one class . . . .” Frank J. Trelease, *Alaska’s New Water Use Act*, 2 LAND & WATER L. REV. 1, 15 (1967) [hereinafter *Alaska*]. Therefore, Alaska’s Act does not distinguish between streams, groundwater, and diffused surface water. *Id.*

The Act covers any activity that involves a “diversion, impounding, or withdrawal” of a certain amount of water. ALASKA STAT. §§ 46.15.180, .255, .260(2). An applicant does not need a permit to fish, boat, or pollute water because these acts are not considered regulated water usages under the Act. *Alaska, supra* at 17.

283. ALASKA STAT. § 46.15.080. The statute provides in pertinent part: “The permit device gives the state the power to protect itself and others from

missioner of ADNR shall "adopt procedural and substantive regulations to carry out the provisions of this chapter, taking into consideration the responsibilities of the Alaska Department of Environmental Conservation (ADEC) under [the Alaska Environmental Conservation Law]." <sup>284</sup> These responsibilities include promulgating pollution regulations.

The Alaska Environmental Conservation Law monitors pollution. <sup>285</sup> This Act is administered by ADEC. <sup>286</sup> The Act establishes the Alaskan Clean Water Fund, a monetary account distinct from any other money in the treasury, in order to finance a variety of water pollution control methods. <sup>287</sup>

ADNR and ADEC regulate water quantity and water quality. As previously noted, in allocating water, ADNR is to consider the responsibilities of ADEC in regulating water pollution. <sup>288</sup> However, this is the only interaction between the two systems.

#### *b. Arizona*

Arizona allocates surface water through the prior appropriation doctrine as codified in the Arizona Surface Water Code. <sup>289</sup> Groundwater use is controlled by the Arizona Groundwater Code. <sup>290</sup> The Arizona Department of Water Resources (ADWR) administers the use of surface water and groundwater rights. <sup>291</sup>

The director of ADWR can approve appropriation of water

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undesirable uses." *Alaska, supra* note 282, at 22. In order to receive a permit the water use must not unreasonably affect the rights of prior appropriators. ALASKA STAT. § 46.15.080(a)(1). The means of diversion or construction must be sufficient. ALASKA STAT. § 46.15.080(a)(2). Water must be for beneficial use. ALASKA STAT. § 46.15.080(a)(3). The use must be in the "public interest." ALASKA STAT. § 46.15.080(a)(4).

284. ALASKA STAT. § 46.15.020(b)(1).

285. ALASKA STAT. § 46.03.030. ADEC has jurisdiction to prevent and abate the pollution of the waters of the state. ALASKA STAT. § 46.03.050.

286. ALASKA STAT. § 46.03.030. It is ADEC's responsibility to prevent and abate pollution of Alaska's water. ALASKA STAT. § 46.03.050. In order to dispose of any solid or liquid into Alaskan waters, an applicant must obtain a permit. ALASKA STAT. § 46.03.100. The Department of Natural Resources receives a copy of the permit application. ALASKA STAT. § 46.03110(c).

ADEC also administers the Alaska Oil Pollution Control Law. ALASKA STAT. §§ 46.04.010-.900, and the Alaska Oil and Hazardous Substance Release Laws. ALASKA STAT. §§ 46.08.005-.900.

287. ALASKA STAT. § 46.03.032. Among other things, the Alaskan Clean Water Fund can be used to build or modify public water treatment and distribution systems. ALASKA STAT. § 46.03.032(3).

288. *See supra* note 284 and accompanying text.

289. ARIZ. REV. STAT. ANN. § 45-141(A) (1987).

290. ARIZ. REV. STAT. ANN. § 45-401 to -655 (1987 & Supp. 1991).

291. ARIZ. REV. STAT. ANN. § 45-103 (1987).

unless it "is a menace to public safety, or is against the interests and welfare of the public."<sup>292</sup> Pollution is regulated separately by the Arizona Water Quality Control Law, administered by the Department of Environmental Quality.<sup>293</sup> Arizona has little or no administrative coordination of water quality and quantity.

*c. Idaho*

Idaho allocates water through the prior appropriation doctrine.<sup>294</sup> Groundwater<sup>295</sup> and surface water<sup>296</sup> are distributed using a permit system administered by the Idaho Department of Water Resources.<sup>297</sup>

Pollution is regulated by the Idaho Department of Health and Welfare, Division of Environmental Quality.<sup>298</sup> Water quality and quantity are managed by two different administrative agencies with no appreciable interaction.

*d. Kansas*

Kansas allocates both streams and groundwater according to a prior appropriation, California Doctrine system.<sup>299</sup> Allocation of water is guided by the principle that all water in Kansas is for the benefit of all state residents.<sup>300</sup> Those who want to use water may do so only after applying for an appropriation permit from the chief engineer of the Division of Water Resources of the State Board of Agriculture.<sup>301</sup> In addition to the permit process, allo-

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292. ARIZ. REV. STAT. ANN. § 45-153(A) (1987). The manner in which public safety and "against the interests and welfare of the public" are defined may encompass qualitative values. *Id.*

293. ARIZ. REV. STAT. ANN. §§ 49-201 to -203 (1988).

294. IDAHO CONST. art. 15, § 3. Prior appropriation is codified at IDAHO CODE § 42-104 (1990). See generally Wells A. Hutchins, *Idaho Law of Water Rights*, 5 IDAHO L. REV. 1 (1968).

295. IDAHO CODE § 42-229.

296. IDAHO CODE § 42-103.

297. IDAHO CODE §§ 42-202, 42-1701.

298. IDAHO CODE §§ 39-101 to -119 (1985 & Supp. 1991).

299. John Peck, *Kansas*, in 6 WATERS AND WATER RIGHTS 161 (Robert E. Beck ed., 2d ed. 1991). Prior to the passage of the Water Appropriation Act in 1945, KAN. STAT. ANN. §§ 82a-701 to -732 (1989), riparian principles were used to settle disputes between those drawing water from streams. Peck, *supra*, at 161. Disputes over groundwater were settled according to the absolute ownership doctrine. *Id.*

300. KAN. STAT. ANN. § 82a-702 (1989 & Supp. 1991).

301. Peck, *supra* note 299, at 161. Those who were using water prior to the date when the Water Appropriation Act of 1945 went into effect were allowed to continue their usage because they had "vested rights." *Id.* See KAN. STAT. ANN. § 82a-701(d) (1989). Some exceptions to the requirement of obtaining a permit include domestic use and diversion of water into a reservoir that has a capacity

tion of water resources is also limited by the Kansas Water Office.<sup>302</sup>

The Kansas Department of Health and Environment is the primary agency responsible for regulating and controlling pollution in the state.<sup>303</sup> The Department is authorized to make rules and regulations for the purpose of cleaning up pollution, preventing pollution of soil and water, and setting water quality standards.<sup>304</sup>

There is limited coordination between water allocation and water pollution agencies. Some transfers of water may require approval from the Chief Engineer, the Director of the Kansas Water Office, and the Secretary of Health and Environment.<sup>305</sup> The Department of Health and Environment also sets the standards for public water and public sewage systems.<sup>306</sup>

*e. Montana*

Montana is a prior appropriation state.<sup>307</sup> With very few exceptions, uses of water require a permit.<sup>308</sup> Those who desire to use water must apply for a permit from the Department of Natural Resources and Conservation.<sup>309</sup> Issuance of the permit is based upon the principle that a use should not adversely affect other

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of 15 acre feet or less. KAN. STAT. ANN. § 82a-728. Permit holders must file an annual report on their water use with the Chief Engineer or face a civil penalty not to exceed \$250. KAN. STAT. ANN. § 82a-732(a), (b).

302. Peck, *supra* note 299, at 161-62. The office is headed by a director and advised by the 21 members of the Kansas Water Authority. *Id.* at 161. The office is responsible for planning future uses of water in the state. *Id.* at 161-62.

303. Peck, *supra* note 299, at 165-66.

304. KAN. STAT. ANN. § 65-171d(a) (1985 & Supp. 1991).

305. KAN. STAT. ANN. §§ 82a-1501 to -1506 (1989 & Supp. 1991). Under the Water Transfer Act, a party who wants to transfer more than 1,000 acre feet of water over a distance of 10 miles must submit to a hearing by a panel composed of the Chief Engineer, the Director of the Kansas water office, and the Secretary of Health and Environment. KAN. STAT. ANN. § 82a-1503(d). If the panel approves the transfer, it must still be approved by the water authority. If approved by the water authority, the legislature may still deny the transfer. KAN. STAT. ANN. § 82a-1504(c).

306. KAN. STAT. ANN. § 65-171h (1985).

307. Al Stone, *Montana*, in 6 WATERS AND WATER RIGHTS 251, 251 (Robert E. Beck ed., 2d ed. 1991).

308. *Id.* According to the 1973 Water Use Act, a permit was necessary to acquire water, "regardless of its character or manner of occurrence." MONT. CODE ANN. § 85-2-102(16) (1991).

309. MONT. CODE ANN. § 85-2-302 (Temporary) (1991). A substantially similar law becomes effective on July 1, 1993. MONT. CODE ANN. § 85-2-302 (effective July 1, 1993) (1991).



appropriators.<sup>310</sup> Large scale uses must also be reasonable.<sup>311</sup> The Department of Health and Environmental Sciences is responsible for setting standards and determining beneficial uses for water.<sup>312</sup>

*f. Nebraska*

Nebraska previously had a strong riparian rights system.<sup>313</sup> However, Nebraska presently allocates surface water according to a prior appropriation system.<sup>314</sup> Nonriparians are able to obtain water through a permit system.<sup>315</sup> The user must apply for a permit from the Department of Water Resources.<sup>316</sup> Groundwater is allocated through a permit system.<sup>317</sup> However, use of the water must be for beneficial purposes.<sup>318</sup>

Pollution control comes under the jurisdiction of the Department of Environmental Control.<sup>319</sup> This Department is also responsible for the administration of the NPDES of the federal CWA.<sup>320</sup> There is limited coordination of water allocation and water pollution in Nebraska.

*g. Nevada*

Nevada is a prior appropriation state.<sup>321</sup> A party wishing to obtain use of water must apply to the Nevada State Engineer.<sup>322</sup> While water may be put to a beneficial use, the public trust doc-

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310. MONT. CODE ANN. § 85-2-311(b).

311. MONT. CODE ANN. § 85-2-311(2). Permits for 4,000 acre feet per year or 5.5 cubic feet per second or greater require a determination by the Department of Natural Resources and Conservation that the use is reasonable. *Id.*

312. MONT. CODE ANN. § 75-5-301 (1991). The Board is established by MONT. CODE ANN. § 2-15-2107 (1991).

313. Eric Pearson, *Nebraska*, in 6 WATERS AND WATER RIGHTS 261, 261 (Robert E. Beck ed., 2d ed. 1991). Riparianism was adopted in Nebraska by statute in 1855. *Id.* The state officially adopted the common law of England. 1855 NEB. LAWS 131.

314. NEB. REV. STAT. §§ 46-201 to -243 (1988 & Supp. 1991).

315. Pearson, *supra* note 313, at 263.

316. NEB. REV. STAT. §§ 46-204 to -243 (1988 & Supp. 1991).

317. NEB. REV. STAT. § 46-660 (1988).

318. *Id.*

319. Pearson, *supra* note 313, at 268. The Department is divided into the four major sections of Ground Water, Permits and Compliance, Wastewater Facilities, and Surface Water. *Id.* See NEB. REV. STAT. § 81-1501 (1987).

320. Pearson, *supra* note 313, at 268.

321. Ross E. de Lipkau, *Nevada*, in 6 WATERS AND WATER RIGHTS 269, 269 (Robert E. Beck ed., 2d ed. 1991). See *Lobdell v. Simpson*, 2 Nev. 274 (1866).

322. NEV. REV. STAT. § 533 (1986 & Supp. 1991). For the law on groundwater, see NEV. REV. STAT. § 534. The State Engineer has the power to reject the permit on the following grounds: if the water has been fully appropriated, if

trine has not been adopted or recognized in Nevada.<sup>323</sup>

Water pollution is controlled by the Division of Environmental Protection which occasionally relies upon the assistance of the U.S. Army Corps of Engineers.<sup>324</sup> There is little coordination between the State Engineer and the Department of Environmental Protection because the two agencies remain within their own statutory authority.<sup>325</sup>

#### *h. New Mexico*

New Mexico is a prior appropriation state.<sup>326</sup> While the public trust doctrine has not been expressly used in New Mexico, the legislature and courts of New Mexico recognize public welfare as a factor in the allocation of water resources.<sup>327</sup> Water rights are administered by the State Engineer.<sup>328</sup> Although New Mexico does not have a central water pollution control agency, the Water Quality Control Commission is responsible for setting water pollution policies.<sup>329</sup> Much of the Commission's administrative work is handled by the Environmental Improvement Division of the Department of Health and Environment.<sup>330</sup>

#### *i. Wyoming*

Wyoming is a pure prior appropriation state.<sup>331</sup> Water appropriation permits are issued by application to the State

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granting the permit would adversely affect the existing rights of other parties, or if granting the permit would harm the public. *Id.*

323. de Lipkau, *supra* note 321, at 271. For the law permitting water to be put to beneficial uses, see NEV. REV. STAT. § 534.120(2).

324. de Lipkau, *supra* note 321, at 275.

325. *Id.* This is especially true of waste water disposal. *Id.*

326. Charles T. Du Mars, *New Mexico*, in 6 WATERS AND WATER RIGHTS 289 (Robert E. Beck ed., 2d ed. 1991) [hereinafter *New Mexico*]. See N.M. CONST. art. XVI, § 2. (prior appropriation principle adopted in New Mexico's constitution). See also Du Mars, *New Mexico Water Law: An Overview and Discussion of Current Issues*, 22 NAT. RESOURCES J. 1045 (1982).

327. N.M. CONST. art. XVI, § 3. The state constitution states that, "beneficial use shall be the basis, the measure and the limit of the right to use water." *Id.*

328. N.M. STAT. ANN. § 72-2-1 (Michie 1985 & Supp. 1991).

329. N.M. STAT. ANN. § 74-6-3 (Michie Supp. 1991). The Commission is authorized to accept federal, state, and private loans and grants; adopt comprehensive water quality plans; set water quality standards to guide pollution control efforts; and issue regulations to prevent and abate water pollution. N.M. STAT. ANN. § 74-6-4(A) to (D).

330. N.M. STAT. ANN. §§ 74-6-2, -3 (Michie 1990 & Supp. 1991). See *New Mexico*, *supra* note 326, at 294.

331. WYO. STAT. §§ 41-3-101 (defined surface waters), 41-3-901 to -919 (groundwaters) (1977 & Supp. 1991).

Engineer.<sup>332</sup>

Water pollution regulation is administered by the Water Quality Division of the Department of Environmental Quality.<sup>333</sup> This department is a separate entity from the agency that allocates water quantity. Water is allocated by water conservation districts and administered by a water rights Board of Control.<sup>334</sup>

### 3. *Dual Systems*

#### a. *Oregon*

Oregon employs a dual system for the allocation of water rights. This system recognizes appropriative rights subject to established riparian rights that have been beneficially exercised prior to the passage of the 1909 water code.<sup>335</sup> The Water Resource Commission issues water appropriation permits.<sup>336</sup>

Water pollution is regulated by the Department of Environmental Quality (DEQ). DEQ is guided by the Environmental Quality Commission in administering discharges into Oregon's waters, air, and soil.<sup>337</sup>

### 4. *Regulated Riparianism*

#### a. *Massachusetts*

Massachusetts' water allocation system is in a state of transition.<sup>338</sup> Prior to the passage of the Water Management Act of 1985,<sup>339</sup> water allocation in the state was governed by riparian principles.<sup>340</sup> Groundwater can be drawn even if it diverts water from neighboring land. However, there is an obligation to use reasonable caution to prevent harm to neighboring land.<sup>341</sup> Presently, the Department of Environmental Quality Engineering (DEQE) regulates allocations of surface water or groundwater

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332. WYO. STAT. § 41-4-502 (1977 & Supp. 1991).

333. WYO. STAT. § 35-11-109 (1977 & Supp. 1991).

334. WYO. STAT. § 41-3-749 (1977).

335. OR. REV. STAT. § 537.120 (stream water); §§ 537.625, .630 (groundwater) (1988 & Supp. 1992).

336. OR. REV. STAT. § 537.130.

337. OR. REV. STAT. §§ 468.005-.035 (1992).

338. Denis Binder, *Massachusetts*, in 6 WATERS AND WATER RIGHTS 197, 197-99 (Robert E. Beck ed., 2d ed. 1991).

339. MASS. GEN. LAWS ANN. ch. 21G, §§ 1-19 (West Supp. 1992).

340. Binder, *supra* note 338, at 197.

341. *See* *Gamer v. Town of Milton*, 195 N.E.2d 65 (Mass. 1964) (there is duty to undertake reasonable precautions to avoid harming adjoining land); *Davis v. Spaulding*, 32 N.E. 650 (Mass. 1892); *Greenleaf v. Francis*, 35 Mass. (18 Pick.) 18 (1836).

that exceed 100,000 gallons per day.<sup>342</sup> Those with user rights prior to passage of the Act were allowed to continue such use if they had registered with DEQE prior to 1989.<sup>343</sup> State law is also guided by the public trust doctrine.<sup>344</sup>

Massachusetts enforces the Clean Water Act.<sup>345</sup> The Department of Environmental Protection is responsible for granting discharge permits required by the Act.<sup>346</sup> DEQE can directly penalize polluters who are in violation of the laws.<sup>347</sup> This activity is the primary example of coordination between water allocation and water pollution agencies.

*b. North Carolina*

North Carolina allocates surface water using a riparian reasonable use doctrine.<sup>348</sup> In order to claim riparian rights, the potential user must demonstrate that the land has contact with the water.<sup>349</sup> Riparian owners must generally use any water diverted from a stream for their property or the use is per se unreasonable.<sup>350</sup> A party wishing to use water from a capacity use area<sup>351</sup> must obtain a permit from the Environmental Management

342. Binder, *supra* note 338, at 197. See MASS. GEN. LAWS ANN. ch. 21G, § 7 (West Supp. 1992).

343. Binder, *supra* note 338, at 197.

344. Binder, *supra* note 338, at 201.

345. MASS. GEN. LAWS ANN. ch. 21G, § 3 (West Supp. 1991).

346. *Id.*

347. Binder, *supra* note 338, at 202. Fines range from \$2,500 to \$25,000 per day each day a violation occurs or continues. Violators may also be imprisoned for up to one year. MASS. GEN. LAWS ANN. ch. 21, § 42(a) (West 1981 & Supp. 1992). Polluters may be subject to civil fines of \$10,000 per day. MASS. GEN. LAWS ANN. ch. 21, § 42(b).

348. Allen Jernigan, *North Carolina*, in 6 WATERS AND WATER RIGHTS 303 (Robert E. Beck ed., 2d ed. 1991). See *Dunlap v. Carolina Power & Light Co.*, 195 S.E. 43 (N.C. 1938).

349. *Miller v. Copping*, 135 S.E.2d 1 (N.C. 1964).

350. Jernigan, *supra* note 348, at 304. See *City of Durham v. Eno Cotton Mills*, 54 S.E. 453 (N.C. 1906). See also *Bruton v. Carolina Power & Light Co.*, 6 S.E.2d 822 (N.C. 1940) (judges may consider foreseeable downstream effects in determining reasonableness of use).

351. N.C. GEN. STAT. § 143-215.13(b) (1990). A capacity use area is defined by the statute as:

[O]ne where the Commission finds that the aggregate uses of ground-water or surface water, or both, in or affecting said area (i) have developed or threatened to develop to a degree which requires coordination and regulation, or (ii) exceed or threaten to exceed, or otherwise threaten or impair, the renewal or replenishment of such waters or any part of them.

*Id.*

Commission.<sup>352</sup>

Primary responsibility for controlling water pollution in North Carolina is vested in the Division of Environmental Management (DEM), a division of the Department of Environment, Health, and Natural Resources.<sup>353</sup> The Environmental Management Commission has the authority to grant permits as a means of controlling water pollution.<sup>354</sup> Coordination between water allocation and pollution control is primarily limited to the regulation of capacity use areas.<sup>355</sup>

## V. DISCUSSION

There is some correlation between a state's geographical location and the degree to which it coordinates its pollution regulation and water use systems. Figure 1 clearly illustrates that disjunctive water management is largely, though not exclusively, associated with the eastern states. This relationship is largely the result of the eastern dominance of the prototypical disjunctive system, riparian rights. The plethora of riparian rights states supports the overall conclusion that a majority of states (66%) fail to integrate water allocation and water pollution management.<sup>356</sup> However, if the water management policies of riparian states are discounted, the number of states which employ unified (22%) or coordinated (12%) systems outnumber the amount of states which retain a disjunctive management policy (24%).

There are additional correlations between the type of water allocation system and the overall water management system. In addition to possessing a direct relationship with riparian rights, disjunctive systems are strongly associated with prior appropriation systems. Of the 24% of the states which are appropriative, 75% are also disjunctive. Conversely, the more progressive systems of water allocation management are commonly associated

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352. N.C. GEN. STAT. § 143-215.15(a). According to the state statute: If the Commission determines that withdrawals of water from or discharge of water pollutants to the waters within such area has resulted or probably will result in a generalized condition of water depletion or water pollution within the area to the extent that the availability or fitness for use of such water has been impaired for existing or proposed uses and that injury to the public health, safety or welfare will result if increased or additional withdrawals or discharges occur . . . .

N.C. GEN. STAT. § 143-215.13(d).

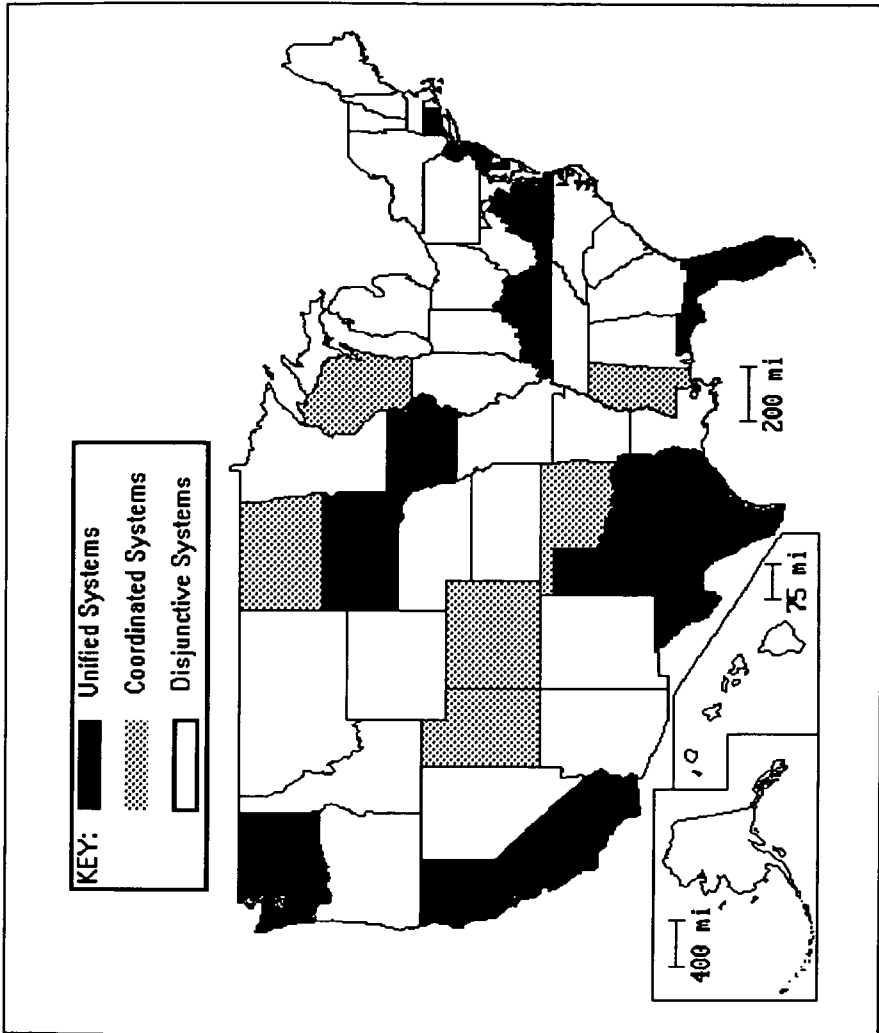
353. Jernigan, *supra* note 348, at 310.

354. N.C. GEN. STAT. § 143B-282 (1990).

355. N.C. GEN. STAT. § 143B-282(1)(k), (l).

356. See Figure 1 and Tables 1 and 2.

FIGURE 1. A graphical representation of the respective water management systems of the United States. Black shading signifies a coordinated system, grey shading signifies a coordinated system, and no shading signifies a disjunctive system.



with the more progressive systems of overall water management. Dual system and regulated riparianism states account for all of the unified systems (22% of all states) and 82% of those states which employ either unified or coordinated management. Regulated

TABLE I. The water management systems of the states by percentage.

SYSTEMS	UNIFIED	COORDINATED	DISJUNCTIVE
RIPARIAN RIGHTS	Not Applicable	Not Applicable	21/50 (42%)
PRIOR APPROPRIATION	0/50 (0%)	3/50 (6%)	9/50 (18%)
DUAL SYSTEMS	4/50 (8%)	3/50 (6%)	1/50 (2%)
REGULATED RIPARIANISM	7/50 (14%)	0/50 (0%)	2/50 (4%)

riparianism seems to be the water allocation system which is most conducive to unified water management, based on the observation that 77% of regulated riparian states are unified while only 50% of dual systems are unified.

Based on the foregoing analysis, it appears that the synthesis of pollution control and water use may be facilitated through the adoption of a dual system or regulated riparian approach to water allocation. Those states which retain the riparian rights doctrine should consider its limiting effect on the ability to manage water pollution. Efficiency considerations also provide a strong rationale for coordinating water quality and quantity under a unified system. As one commentator has noted, "Ideally, planning responsibility should be vested in a single agency. Planning authority, however, often is fragmented among several agencies. This lack of coordination often results in state programs that emphasize one aspect of a water problem but neglect its impact on other phases of the hydrological cycle."<sup>357</sup> Unified systems facilitate the efficient regulation of pollution and water use. Rather than several agencies attacking one concern, unification of state efforts considers the interdependent problems of quality and quantity posed by the management of water resources.

Coordinated water management systems are utilized in 12% of the states. Of these coordinated systems, half are dual systems and half are prior appropriation systems. This study defines a coordinated system as one in which two or more separate agencies manage water use and pollution, but there is some amount of co-

357. Richard Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 WM. & MARY L. REV. 547, 579 (1983).

operation between the agencies. Consequently, in the future, these states may consider merging the two functions under the responsibility of one organization.

The 66% of the states which are disjunctive have not instituted integrated methods of administering the relationship between water quality and quantity. The 64% of these states which are also riparian regulate water allocation through the judicial system. Such a traditional approach does not address the problems of pollution or allocation as effectively as administrative regulation.<sup>358</sup> In order to have standing against a polluter or competing consumer, a riparian's use must have been illegally inhibited. Based on the standing requirement, water management under a riparian system is at the mercy of "private attorneys general" who may not share the general public interest. This approach does not allow for efficient or responsive monitoring of water resources in advance. Additionally, nine of the disjunctive systems (or 18% of all states) are prior appropriation water systems. It has been suggested by at least one commentator that "if there is to be a marriage between water quality and quantity, we'll not find . . . Prior Appropriation, standing at the altar."<sup>359</sup>

## VI. CONCLUSION

The historical development of water law has failed to address the interdependent nature of the hydrological cycle. The need for an integrated approach has become apparent.<sup>360</sup> In order to allocate water in the most efficient and beneficial way, water pollution regulation must be considered in combination with state water allocation law.<sup>361</sup> However, in a majority of states, the or-

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358. See *supra* notes 56-62 and accompanying text.

359. Squier, *supra* note 8, at 1082.

360. la Riviere, *supra* note 9, at 92. Selecting an integrated approach to water management should include the following considerations:

In every river or lake basin, socioeconomic and environmental aspirations must be orchestrated so that human settlements, industry, energy production, agriculture, forests, fisheries and wildlife can coexist. In many cases varied interests are not necessarily in conflict; they can be synergistic. Erosion control, for example, goes hand in hand with reforestation, flood prevention and water conservation.

*Id.*

361. Vranesh, *supra* note 10, at 6. According to Vranesh:

Nearly any use of water causes a diminution in quality in some respect. At some point these two rights, water quantity and water quality, collide so that one or the other must give way. . . . We must not lose sight of the fact that both water quantity and water quality constitute the concept of water law.

*Id.*



ganization charged with the coordination of water allocation is independent of the organization responsible for the regulation of water pollution. This artificial distinction conflicts with current knowledge that "water quality and water quantity are not separable items today."<sup>362</sup>

An integrated approach will require governmental personnel and agencies to cooperate in order to effectively eliminate the disjunctive method currently followed by most states.<sup>363</sup> Failure to integrate water management poses serious environmental risks.<sup>364</sup> It is time for states to take a holistic approach to the complex issues surrounding our most precious resource, water.

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362. Squier, *supra* note 8, at 1081-82. The author subsequently states: "Any separation between water quantity and water quality is artificial and stands in the way of solutions." *Id.*

363. la Riviere, *supra* note 9, at 92. This commentator has noted that "[a]n integrated approach calls, of course, for closer cooperation at the governmental and intergovernmental level; it goes against the historical allocation of different tasks to different agencies." *Id.*

364. la Riviere, *supra* note 9, at 94. Failure to do so risks the following serious environmental consequences:

Many aspects of the hydrological cycle, including the fluxes between its compartments and the extent of groundwater reserves, are not accurately known. . . . Predicting what is likely to happen if sound principles of water management are not vigorously implemented is all too easy. We have already seen rivers turn into sewers and lakes into cesspools. People die from drinking contaminated water, pollution washes ashore on recreational beaches, fish are poisoned by heavy metals and wildlife habitats are destroyed. A laissez-faire approach to water management will spell more of the same—on a grander scale. One can only hope recognition of that fact will spur governments and people into action.

*Id.*

Ausness would also advocate placing the regulation of consumptive use and water quality control under the same agency. Ausness, *supra* note 1, at 6.

**TABLE II. The respective water management systems of the states.**

<b>SYSTEMS</b>	<b>UNIFIED</b>	<b>COORDINATED</b>	<b>DISJUNCTIVE</b>
<b>RIPARIAN RIGHTS</b>	Not Applicable	Not Applicable	Alabama Arkansas Georgia Hawaii Illinois Indiana Louisiana Maine Maryland Michigan Minnesota Missouri New Hampshire New York Ohio Pennsylvania Rhode Island South Carolina Tennessee Vermont West Virginia
<b>PRIOR APPROPRIATION</b>	None	Colorado Mississippi Utah	Alaska Arizona Idaho Kansas Montana Nebraska Nevada New Mexico Wyoming
<b>DUAL SYSTEMS</b>	California South Dakota Texas Washington	North Dakota Oklahoma Wisconsin	Oregon
<b>REGULATED RIPARIANISM</b>	Connecticut Delaware Florida Iowa Kentucky New Jersey Virginia	None	Massachusetts North Carolina

