

1986

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Repository Citation

Butler, Lynda L., "Defining a Water Ethic Through Comprehensive Reform: A Suggested Framework for Analysis" (1986). *Faculty Publications*. 139.

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DEFINING A WATER ETHIC THROUGH COMPREHENSIVE REFORM: A SUGGESTED FRAMEWORK FOR ANALYSIS

Lynda L. Butler*

America has long been a land of plentiful water resources. On an average day, 4.2 trillion gallons of precipitation fall on the continental United States,¹ or approximately 19,000 gallons per person.² With estimates like these, water shortages in America are difficult to imagine. As preposterous as the idea may seem, however, an increasing number of experts see the prospect of a serious shortage as likely. Many areas of the country are using and depleting water supplies faster than they are replenished.³ Further, even where water is still abundant, pollutants increasingly threaten its quality.⁴ For these and other reasons, many experts predict that water may soon replace energy as the nation's next resource crisis.

To deal with the problem of water shortages, many observers are calling for comprehensive plans to manage and protect the nation's water resources.⁵ To date, reform efforts have produced many comprehensive

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The author wishes to thank the College of William and Mary for supporting this article through a summer research grant. The author also wishes to thank Charles Koch for his comments on an earlier draft of this article and gratefully acknowledges the research assistance and dedication of Anne Bugg and Alison Vadnais and the word processing skills and supportive attitude of Helen Adkins.

1. See 1 U.S. WATER RESOURCES COUNCIL, THE NATION'S WATER RESOURCES, 1975-2000, at 12 (1978). Of the total precipitation, about two-thirds evaporates immediately and the remaining amount generally contributes to ground and surface water supplies. See *id.*

2. This figure was derived by dividing the precipitation figure by the 1980 population total for the continental United States, which was 225,581,114, and rounding the quotient to the nearest thousand. See BUREAU OF THE CENSUS, U.S. DEP'T OF COMM., 1980 CENSUS OF POPULATION, CHARACTERISTICS OF THE POPULATION—NUMBER OF INHABITANTS, U.S. SUMMARY 1-33, 1-43 (1983).

3. See, e.g., GEOLOGICAL SURVEY, U.S. DEP'T OF THE INTERIOR, NATIONAL WATER SUMMARY 1983—HYDROLOGIC EVENTS AND ISSUES 23-45 (Water-Supply Paper 2250, 1984) [hereinafter cited as NATIONAL WATER SUMMARY 1983]; 1 U.S. WATER RESOURCES COUNCIL, *supra* note 1, at 48-59.

4. See 1 U.S. WATER RESOURCES COUNCIL, *supra* note 1, at 60-67.

5. See, e.g., U.S. NATIONAL WATER COMM'N, WATER POLICIES FOR THE FUTURE 280-94 (1973) [hereinafter cited as WATER POLICIES]; Maloney & Ausness, *A Modern Proposal for State Regulation of Consumptive Uses of Water*, 22 HASTINGS L.J. 523 (1971); Trelease, *New Water Legislation: Drafting for Development, Efficient Allocation and Environmental Protection*, 12 LAND & WATER L. REV. 385 (1977). But see J. HIRSHLEIFER, J. DEHAVEN & J. MILLIMAN, WATER SUP-

proposals, but they have yielded few new state statutes.⁶ Despite the low enactment rate, however, comprehensive reform represents the most effective way to address serious water resource problems. Without such reform, traditional common law principles will continue to govern the use and management of water resources in many jurisdictions. Although the common law provides useful tools for accommodating increased water needs, the tools require handling by an innovative judiciary willing to take an active role in developing a responsive water allocation system.⁷ Without such an active and informed judiciary, the common law generally will frustrate efforts to meet rising water use needs.⁸

As explained in this article, reform proposals have largely failed to gain broader acceptance, despite strong arguments supporting them,⁹ because they do not consider key factors and concerns. Current proposals contain an almost single-minded focus on efficiency, and they try to propound a uniform set of principles to govern water use, often at the expense of localized needs and concerns.¹⁰ Like Americans generally, many comprehensive reformists have become accustomed to "turning on the tap;"¹¹ promoting the efficient, present use of water is their primary objective. Other objectives and concerns, if identified, are typically secondary in importance to the provisions encouraging efficient use today.¹²

To develop an effective, balanced water allocation system responsive to the needs of many people, reformists must define and develop a responsible water ethic. They must promote, to be sure, the efficient, present use of water. But they must also promote water management policies that serve society's future water use needs and that serve society's many nonconsumptive values and concerns. Implicit in this notion of a new

PLY: ECONOMICS, TECHNOLOGY, AND POLICY 222, 252-54 (1969) (advocating a system contrary to the centralized systems typically proposed).

6. Florida and Iowa are the only states that have adopted truly comprehensive water allocation systems. See FLA. STAT. ANN. §§ 373.012-.619 (West 1974 & Supp. 1986); IOWA CODE ANN. §§ 455B.261-.281 (West Supp. 1986). For a discussion of less comprehensive reforms adopted in various states, see Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 WM. & MARY L. REV. 547 (1983).

7. See generally Butler, *Allocating Consumptive Water Rights in a Riparian Jurisdiction: Defining the Relationship Between Public and Private Interests*, 47 U. PITT. L. REV. 95 (1985) (discussing such tools).

8. For a discussion of some of the outdated assumptions and principles that thwart efforts to satisfy public consumptive needs, see Butler, *supra* note 7, at 156-79.

9. For a discussion of these arguments, see Maloney & Ausness, *supra* note 5.

10. Other factors also have contributed to the reforms' failure to gain widespread acceptance. In many states the financial burdens that implementing a new water allocation system would impose simply are too high to justify legislative approval. Furthermore, although water shortages are becoming more frequent in traditionally water-rich eastern states, the shortages generally have not become serious enough to convince many legislators that a drastic change is needed. In its report, *Water Policies for the Future*, the National Water Commission acknowledges these points, concluding that immediate reform would be inappropriate for some eastern states. WATER POLICIES, *supra* note 5, at 280.

11. *How to Make Sure There's Enough Good Water*, U.S. NEWS & WORLD REPORT, Mar. 18, 1985, at 65, 68 (quoting from statement by Rep. Tom Foley).

12. See, e.g., *infra* notes 138-44 and accompanying text (discussing secondary role played by environmental policies).

water ethic is the view that interests in water resources can be legitimate even though they do not encourage or promote consumptive use. If a water allocation system is to respond to the needs of a diverse citizenry, it must recognize and actively promote all key interests and concerns.

In short, the type of comprehensive reform that is needed must incorporate a water ethic that balances factors and concerns falling into one of three general categories. One group includes concerns and interests relating to efficiency. Although comprehensive measures proposed to date clearly attempt to promote efficiency, their emphasis on this objective is at times excessive and unnecessarily restrictive. Furthermore, some of the measures actually frustrate, rather than promote, efficient use. The other two categories include concerns relating to equitable or fairness considerations and to environmental values, categories that many present reforms either ignore or shortchange. The serious opposition to comprehensive proposals has stemmed in large part from their inattention to these nonefficiency factors.

This article examines the different types of values and concerns that are important in developing a cohesive water ethic and a balanced water allocation system. As the discussion should indicate, a comprehensive water use and management plan that incorporates some of these factors and concerns will necessarily focus less on efficient consumption and more on flexibility and nonconsumptive values than past reforms. If a responsive water ethic is to be developed, reformists must abandon some of their efforts to encourage use and achieve uniformity.

I. IDENTIFYING THE DETERMINATIVE FACTORS, POLICIES, AND CONCERNS: SOME INTRODUCTORY REMARKS

Comprehensive water law reforms represent ambitious attempts to incorporate into a single statute all the legal principles, rules, and policies relating to the allocation and management of water resources. Although the systems developed so far sometimes vary significantly,¹³ the reforms

13. The most ambitious reforms attempt to integrate all water resources into one allocation and management plan. See, e.g., A MODEL WATER CODE (F. Maloney, R. Ausness & J. Morris 1972) [hereinafter cited as MODEL WATER CODE]; see also Hines, *A Decade of Experience Under the Iowa Permit System* (pt. 1), 7 NAT. RESOURCES J. 499 (1967). Many reforms, however, still follow the common law approach; they distinguish between different types of water resources, such as surface water and groundwater, and develop separate regulatory programs for each primary type. See, e.g., GA. CODE ANN. §§ 12-5-20 to -53, 12-5-90 to -107 (1982 & Supp. 1986) (regulating surface water and groundwater respectively); IND. CODE ANN. §§ 13-2-1-1 to -9, 13-2-2-1 to -13 (Burns 1981 & Supp. 1986) (regulating surface water and groundwater respectively). Compare, e.g., VA. CODE §§ 62.1-44.83 to -44.107 (1982 & Supp. 1986) (only regulating use of groundwater), with *Virginia Hot Springs Co. v. Hoover*, 143 Va. 460, 130 S.E. 408 (1925) (discussing common law doctrine governing surface water). Scientists prefer an integrated system because it reflects the fact that all water resources are part of one hydrologic cycle. For example, groundwater can add to the water level of a surface watercourse. When the groundwater table reaches the level of the surface, the groundwater will increase the volume of nearby surface waters. See generally Davis, *Wells and Streams: Relationship at Law*, 37 MO. L. REV. 189, 195-98 (1972). Because water resources are interrelated, society's use of one type of resource may affect other types. See Ausness, *supra* note 6, at 577.

share certain common elements. Among other features, the comprehensive measures propose permit systems to replace common law principles governing allocation and use.¹⁴ These permit systems typically empower a state agency to develop a comprehensive management plan for the regulated waters, to adopt appropriate regulations, and to implement the permit system.¹⁵ Usually all users except certain exempted classes must obtain permits to use the regulated waters.¹⁶ Exempted uses typically include domestic and agricultural uses not exceeding an identified limit.¹⁷ Other common features¹⁸ include provisions that regulate water use dur-

14. See Ausness, *supra* note 6, at 547.

15. See, e.g., IOWA CODE ANN. §§ 455B.261 to .281 (West Supp. 1986); MODEL WATER CODE, *supra* note 13, §§ 1.05-10.

16. See, e.g., N.J. STAT. ANN. §§ 58:1A-6 to -7 (West 1982); MODEL WATER CODE, *supra* note 13, § 2.01. Statutes frequently provide a general blanket exemption for certain domestic users. See, e.g., FLA. STAT. ANN. § 373.219(1) (West 1974) (exempting individual domestic users); MD. NAT. RES. CODE ANN. § 8-802(b) (1983) (exempting domestic users except those using aquifers for domestic heating or cooling); MODEL WATER USE ACT §§ 301, 303 (Legislative Research Center at the University of Michigan Law School 1958) (exempting domestic users of contained and ground water).

17. See, e.g., FLA. STAT. ANN. § 373.219(1) (West 1974) (individual domestic users); GA. CODE ANN. § 12-5-31(a)(2) (Supp. 1986) (agricultural users); KY. REV. STAT. ANN. § 151.140 (Bobbs-Merrill 1980) (agricultural and domestic users).

18. The permit systems are less uniform in their treatment of interbasin transfers, or the withdrawal of water from a watercourse and the transfer of the water to an area outside the watershed of the watercourse. Although many permit acts recognize interbasin transfer as a valid use, the conditions under which such a transfer is allowed vary. See, e.g., IND. CODE ANN. § 13-2-1-6 (Burns 1981); IOWA CODE ANN. § 455B.265 (West Supp. 1986); KY. REV. STAT. ANN. § 151.200(2) (Bobbs-Merrill Supp. 1986); WIS. STAT. ANN. § 30.18 (West Supp. 1986). See generally Ausness, *supra* note 6, at 556-76 (discussing reforms adopted in eastern states). Indiana authorizes diversion of flood water only when the diversion does not injure landowners or water users in the situs watershed. IND. CODE ANN. § 13-2-1-6(1) (Burns 1981). On the other hand, Iowa takes a broader approach. Although its general prohibition against diversions made without a permit appears, at first glance, to limit situations when diversions can occur, see IOWA CODE ANN. § 455B.268(1) (West Supp. 1986), an applicant generally can obtain a permit if the diversion is "consistent with the principles and policies of beneficial use and ensuring conservation." *Id.* § 455B.265(1). But cf. *id.* § 455B.267(4) (prohibiting issuance of a permit to divert, store, or withdraw water "if it will unreasonably impair the long-term availability of water . . . or otherwise adversely affect the public health or welfare"). Under Iowa law, a use is beneficial if it "inures to the benefit of the water user and [is] subject to the user's dominion and control but does not include the waste or pollution of water." *Id.* § 455B.261(7). Furthermore, the prohibition does not affect nonregulated uses, which include using water for household purposes, for domestic animals, and for other beneficial uses not exceeding 25,000 gallons per day. *Id.* § 455B.261(8). Compare *id.* with GA. CODE ANN. § 12-5-31(n)(1) (Supp. 1986) (which authorizes interbasin transfers of surface waters, but requires the decisionmaker to consider competing applications for uses not involving interbasin transfers and, if possible, to make a reasonable allocation to these applicants).

Similar variation exists among the approaches taken by permit acts to parties holding water rights under the common law. Some systems simply exempt uses existing before enactment of the permit system. For example, Delaware exempts all "reasonable-beneficial" uses that existed when the permit system became effective. See Ausness, *supra* note 6, at 556-57. Other acts, however, regulate earlier uses as well. In such a situation, the acts tend either to give the holders of common law water rights a priority in applying for a permit or to apply a lower standard to the common law users. Compare MISS. CODE ANN. § 51-3-5(2) (Supp. 1986) (person having a "right to use surface water" entitled to continue use upon filing a notice of claim to such use in the specified manner), with GA. CODE ANN. § 12-5-31(g) (Supp. 1986) (prior user must receive permit if a prior user's withdrawal was intended to meet the user's "reasonable needs"). Some acts, however, treat all applicants equally. See KY. REV. STAT. ANN. § 151.170(2) (Bobbs-Merrill Supp. 1986) (any "responsible applicant" with "useful purpose" may receive a permit); MINN. STAT. ANN. § 105.41(1a) (West Supp.

ing water shortages,¹⁹ that encourage water conservation,²⁰ and that facilitate the development of public water supplies.²¹

Proponents of comprehensive reform generally advocate that efficiency should be the primary criterion for allocating rights in water resources. An applicant for a permit typically must establish that the intended use is a "reasonable-beneficial use,"²² which is defined in terms of efficiency and economic development. The Florida permit act provides, for example, that "reasonable-beneficial use" is "the use of water in such quantity as is necessary for economic and efficient utilization for a purpose and in a manner which is both reasonable and consistent with the public interest."²³ Derived from the Model Water Code, the most

1986) (all applicants are subject to the same priority system). See generally Ausness, *supra* note 6, at 556-76 (discussing various permit acts in eastern states).

19. See, e.g., FLA. STAT. ANN. §§ 373.175, .246 (West 1974 & Supp. 1986); KY. REV. STAT. ANN. § 151.200(1) (Bobbs-Merrill Supp. 1986).

20. FLA. STAT. ANN. §§ 373.016(2)(b), .191 (West 1974); KY. REV. STAT. ANN. § 151.110 (Bobbs-Merrill Supp. 1986).

21. Provisions that facilitate development of public water supplies typically allow interbasin transfers. See, e.g., IOWA CODE ANN. §§ 455B.261 to .281 (West Supp. 1986); KY. REV. STAT. ANN. §§ 151.140-.210 (Bobbs-Merrill 1980 & Supp. 1986). The Iowa act allows the diversion of water for regulated uses provided the prospective user applies for and obtains a permit. IOWA CODE ANN. § 455B.268(1) (West Supp. 1986). In order for a user to receive a permit authorizing a diversion, the diversion must be "consistent with the principles and policies of beneficial use and ensuring conservation." *Id.* § 455B.265(1). A permit to divert, however, may not be issued "if it will unreasonably impair the long-term availability of water from a surface or groundwater source in terms of quantity or quality, or otherwise adversely affect the public health or welfare." *Id.* § 455B.267(4).

22. See, e.g., FLA. STAT. ANN. § 373.223(1)(a) (West Supp. 1986); MODEL WATER CODE, *supra* note 13, § 2.02(1). Besides requiring a proposed use to be "reasonable-beneficial," the Model Water Code also requires the applicant to establish that the use "will not interfere with any presently existing legal use of water . . . and . . . is consistent with the public interest and the provisions of the State Water Plan." *Id.* These permit standards apply to "all water on or beneath the surface of the ground or in the atmosphere, including natural or artificial watercourses, lakes, ponds, or diffused surface water and water percolating, standing, or flowing beneath the surface of the ground" except for coastal waters. *Id.* § 1.03(8) (defining "water"); *id.* § 2.01(3) (excluding coastal waters from the permit requirements).

A few reforms define the permit standard with greater specificity. For example, Georgia law sets forth a list of factors that the permit board should consider to allocate groundwater. The factors include: (1) the number of persons using a particular groundwater source, and the object, extent, and necessity of their respective withdrawals or uses; (2) the nature and size of the water source; (3) the physical and chemical nature of any impairment of the water source that adversely affects its availability or fitness for other water uses; (4) the probable severity and duration of any such impairment under foreseeable conditions; (5) the injury to public health, safety, or welfare that would result if such impairment were not abated or prevented; (6) the kinds of businesses or activities to which various uses are related; (7) the importance and necessity of the uses claimed by permit applicants and the extent of any injury these uses will or may cause to other water uses; (8) the diversion from or reduction of flows in other water sources; and (9) other relevant factors. GA. CODE ANN. § 12-5-96(d) (1982). See also N.C. GEN. STAT. § 143-215.15(h) (1983) (listing similar factors).

23. FLA. STAT. ANN. § 373.019(4) (West Supp. 1986). This definition and the rest of the Florida Water Resources Act are based on the Model Water Code drafted by F. Maloney, R. Ausness, and J. Morris in 1972. See *supra* note 13. Although the Florida statute does not define what "public interest" means under the reasonable-beneficial use test, the Model Water Code recognizes that the public has "a substantial interest in the prevention, abatement, and control of both new and existing water pollution, and the maintenance of high standards of water quality." MODEL WATER CODE, *supra* note 13, § 1.02(4). Furthermore, the Model Water Code defines the public interest to include "the protection and procreation of fish and wildlife, the maintenance of proper ecological balance and scenic beauty, and the preservation and enhancement of waters of the state for navigation, public

accepted of the comprehensive proposals,²⁴ this definition reflects a determination that water resources should be used productively. As the drafters of the Model Water Code explain in their commentary, the reasonable-beneficial use standard "is intended to protect other water users and the general public from wasteful uses of water."²⁵ The standard does not allow the "wasteful" use of water, "regardless of whether or not there is sufficient water to meet the needs of other riparian owners."²⁶

Consistent with this philosophy, many of the comprehensive reforms also define waste in terms of efficiency and present beneficial use. The Iowa permit act provides, for example, that waste occurs when users allow ground or surface water to flow or otherwise use it in a manner that does not achieve full beneficial use, when an excessive amount of groundwater is lost in transit, or when pollutants invade water-bearing strata.²⁷ Similarly, the Florida permit act defines waste as arising when users pump water from an artesian well and fail to use it "for the beneficial purposes of . . . irrigation . . . , industrial [use] . . . , domestic use, or the propagation of fish."²⁸ These definitions typify the approach taken in many other permit acts,²⁹ which also seek, as their primary objective,

recreation, municipal uses, and public water supply." *Id.* § 1.02(3). Because the Florida Act does not similarly link the public interest with environmental objectives, the economic implications of the reasonable-beneficial use test arguably should be stronger under the Florida Act than under the Model Water Code.

Once issued, permits generally last for a specified period of time, but a holder may renew the permit upon its expiration. The Model Water Use Act allows a term of up to 50 years. MODEL WATER USE ACT § 406 (Legislative Research Center at the University of Michigan Law School 1958). In contrast, the Florida statute and the Model Water Code generally limit the permit period to 20 years. An exception is made for municipalities or other governing bodies constructing water supply systems. Because of the nature of their investment, these bodies can receive a 50-year permit. FLA. STAT. ANN. § 373.236 (West 1974); MODEL WATER CODE, *supra* note 13, § 2.06. The Iowa Act recognizes an even shorter permit period, 10 years. IOWA CODE ANN. § 455B.265(3) (West Supp. 1986).

When applicants compete for a permit, the statutes typically set forth a list of factors, including economic consequences, the necessity of the proposed use, and the nature and extent of the use, for permit boards to consider in determining which party gets the permit. *See, e.g.*, GA. CODE ANN. § 12-5-31(e) (Supp. 1986); MINN. STAT. ANN. § 105.41(1a) (West 1977 & Supp. 1986); N.C. GEN. STAT. § 143-215.15(h) (1983); S.C. CODE ANN. § 49-5-60(h) (Law. Co-op. 1976).

24. Three principal model water reforms exist. The first, the Model Water Use Act, appeared in 1958, the product of the Legislative Research Center at the University of Michigan Law School. *See* MODEL WATER USE ACT (Legislative Research Center at the University of Michigan Law School 1958). It has been adopted by only one state, Hawaii, and even there in modified form. *See* HAWAII REV. STAT. §§ 177-1 to -35 (1985). The second model act was the Model Water Code. *See supra* note 13. It has served as the basis of several permit acts. *See, e.g.*, FLA. STAT. ANN. §§ 373.012-619 (West 1974 & Supp. 1986). In 1973 the National Water Commission also drafted an allocation system. *See* WATER POLICIES, *supra* note 5, at 280-94.

25. MODEL WATER CODE, *supra* note 13, commentary at 170.

26. *Id.* § 1.03(4) commentary at 87.

27. IOWA CODE ANN. § 455B.261(12) (West Supp. 1986). Water-bearing strata can be polluted by salt water and highly mineralized water, as well as by other contaminated water. *Id.* § 455B.261(12)(c). The Iowa definition of waste generally applies throughout the water allocation statute. *See id.* § 455B.261.

28. FLA. STAT. ANN. § 373.203(4) (West Supp. 1986).

29. *See, e.g.*, IND. CODE ANN. § 13-2-2-1 (Burns 1981). Definitions of "waste" found in some

to maximize the present beneficial use of water.

The present-use orientation of these definitions becomes clear by comparing them with the common law doctrine of waste, which limits a present user's ability to exercise its rights of enjoyment.³⁰ One court has defined waste as any act causing "permanent injury to the inheritance or future estate."³¹ This injury could involve "diminishing the value of the inheritance, or increasing its burdens, or . . . destroying the identity of the property."³² Furthermore, because the function of the doctrine is to "preserv[e] . . . the property for the benefit" of the future user,³³ even changes that enhance the value of the property constitute waste if they "change the identity" of the property.³⁴ Thus, traditional property law uses the concept of waste to preserve resources for future use; comprehensive water reforms, by contrast, rely on the concept to encourage present use.³⁵ This comparison raises a crucial question: should comprehensive reformists alter their perspective and their definitions to specifically recognize future rights and interests in water resources? Current reforms generally provide little basis for protecting the needs of future generations in allocation decisions.

Although efficiency is important, the emphasis placed on it by most comprehensive reforms is myopic. For instance, reform measures often only promote water conservation in the context of water shortages and conservation typically plays a vague, secondary role in management and allocation decisions.³⁶ Similarly, although many comprehensive reforms identify ecological and environmental values, these values fill a secondary

permit acts are more limited, focusing on activities that pollute waters. *See, e.g.*, DEL. CODE ANN. tit. 7, §§ 6002(9), (10), (14), (21) (1983); GA. CODE ANN. § 12-5-22(4), (6) (1982); N.C. GEN. STAT. § 143-213(18) (1983). Even the more limited definitions are designed to promote present beneficial use, however, by prohibiting activities that limit the quantity of water available for use.

30. *See generally* 5 AMERICAN LAW OF PROPERTY §§ 20.1-10 (A. Casner ed. 1952).

31. *Melms v. Pabst Brewing Co.*, 104 Wis. 7, 11, 79 N.W. 738, 739 (1899); *see also* *Sigsbee Holding Corp. v. Canavan*, 39 Misc. 2d 465, 240 N.Y.S.2d 900 (1963).

32. *Melms*, 104 Wis. at 12, 79 N.W. at 739.

33. *Id.* at 11, 79 N.W. at 739.

34. *Id.* at 12, 79 N.W. at 740. For obvious policy reasons, however, the courts have developed exceptions to the waste doctrine that sometimes apply when the present user improves the premises. For example, some courts define "waste" restrictively. *See Sigsbee Holding Corp. v. Canavan*, 39 Misc. 2d 465, 240 N.Y.S.2d 900 (1963). Other courts have developed the doctrine of ameliorating waste to protect a tenant who, under appropriate circumstances, improves the land. In *Melms* those circumstances included the fact that the land surrounding the life tenant's estate had completely changed in character from residential property to industrial and commercial property. Changes in the surrounding area rendered the life estate virtually valueless as residential property. The Wisconsin Supreme Court concluded that when "a complete and permanent change of surrounding conditions, which has deprived the property of its value and usefulness as previously used," has occurred, the tenant should not be liable for waste. *Melms*, 104 Wis. at 15, 79 N.W. at 741.

35. Provisions allowing interbasin transfer provide further evidence of the emphasis on present use by comprehensive reforms. *See, e.g.*, MODEL WATER CODE, *supra* note 13, § 2.02(2); FLA. STAT. ANN. § 373.223(2) (West Supp. 1986). At best, comprehensive reforms provide for future generations indirectly through water quality controls and general planning provisions. *See* DEL. CODE ANN. tit. 7, § 6001 (1983); KY. REV. STAT. ANN. § 151.110 (Bobbs-Merrill Supp. 1986); MODEL WATER CODE, *supra* note 13, §§ 1.07, 5.04.

36. For example, the Florida statute contains a few sections which provide for action in case of a water shortage. FLA. STAT. ANN. §§ 373.175, .246 (West 1974 & Supp. 1986). But other than

role, either because of provisions favoring efficient use or because of unclear wording.³⁷ Most of the "nonefficiency" factors overlooked by comprehensive reforms relate to two key issues: determining who should make important management and allocation decisions and deciding how the decisionmaker should allocate and redistribute water resources.

The first issue, determining who should be the decisionmaker, has important distributive implications because the identity of the decisionmaker will often affect how water rights are allocated. The more the decisionmaker favors development and urbanization, the more likely its decisions will favor populated, urban, political subdivisions to the detriment of rural, agricultural areas. Similarly, the stronger the decisionmaker's ties to the state's elected officials, the more likely its decisions will favor populated areas. Such decisions would benefit more people and generate more revenues, and would thus provide more present, tangible benefits to the state. Because allocation decisions cannot satisfy all parties, interested groups are understandably concerned about the identity of the decisionmaker and about ensuring that their interests are fairly considered.

A state might best respond to these concerns by creating an administrative structure that diffuses decision-making responsibility and that is accountable, at least in part, through the democratic process. Comprehensive reformists tend to ignore these possibilities by assuming that efficiency requires a centralized system of management. In their view a permit system that allows each local political unit to administer its own permit system would duplicate effort unnecessarily and encourage the rapid depletion of water supplies. Because water resources are not distributed according to political boundaries, a local political unit operating under such a system could grant permits to use a waterbody located within several political subdivisions without having to consider the actions of the other localities.³⁸

For instance, because underground water supplies are cone-shaped,³⁹ several localities could tap into the same aquifer, or under-

these few provisions, the statute generally defines its water conservation policies in broad, vague terms. *See id.* §§ 373.016(2)-(3), 373.036, 373.191 (West 1974 & Supp. 1986).

37. For example, in its policy provisions the Model Water Code identifies environmental values as valid objectives "in the public interest." MODEL WATER CODE, *supra* note 13, § 1.02(3). Instead of referring specifically to those objectives in defining the permit standard, however, the Code merely requires that the intended use be "consistent with the public interest." *Id.* § 2.02(1)(c). In contrast, the reasonable-beneficial use test specifically refers to the efficiency objective, requiring "[t]he use of water in such a quantity as is necessary for economic and efficient utilization" *Id.* § 1.03(4). Because the Code refers to environmental values only indirectly through the phrase "public interest," an administrator understandably could be induced to favor more identifiable and quantifiable factors, such as those relating to "economic and efficient utilization." *See generally infra* notes 127-44 (discussing further the shortcomings of permit statutes in addressing environmental concerns).

38. *See Miri, Some Problems of Water Resource Management in Virginia: A Preliminary Examination*, 13 WM. & MARY L. REV. 388, 401-08 (1971); *see also* MODEL WATER CODE, *supra* note 13, at 72-75 (discussing the need for a centralized approach).

39. *See Miri, supra* note 38, at 390.

ground water supply. Without cooperation among the localities, the aquifer would decline at a rate much greater than if the localities had acted jointly. The rapid depletion, in turn, would force all the localities to construct new water supply facilities sooner than expected.⁴⁰ To avoid this situation, most comprehensive reform measures place administrative responsibility in one, central state agency.⁴¹

Although a central state administration could, as the reformists argue, lead to a more efficient allocation and management system, an effective administrative framework need not place all regulatory power in one state agency. The legislature could adopt a two-tiered regulatory approach delegating power to regional districts as well as to a central state agency, an approach that could appease local political units fearing control by the state.⁴² By focusing almost exclusively on efficiency, many comprehensive reformists tend to ignore such compromises. Perhaps more significantly, many of the reformists tend to overlook or discount the importance of the nonefficiency concerns underlying much of the political opposition. Although it is often strategically wise to begin the legislative process with the desired bill and to make political compromises later as needed to secure passage, such an approach also can doom the proposal from the beginning.⁴³

In addition to evoking political and fairness concerns, the decisionmaker issue also raises important environmental considerations. The decisionmaker's identity will affect how conflicts involving environmental values are resolved. A pro-development, pro-urbanization decisionmaker, for example, would discount the environmental policies expressed in a comprehensive reform law and view them merely as non-binding guidelines. When comprehensive reform measures incorporate environmental values, they do so in terms that tend to be vague and uncertain.⁴⁴ The implementation of environmental policies thus depends, to a great extent, on the identity of the decisionmaker. More clear, mandatory, environmental provisions would help minimize the effect of an individual administrator's philosophies and would shift the task of

40. *Id.*

41. See, e.g., IOWA CODE ANN. § 455B.262(1) (West Supp. 1986); MINN. STAT. ANN. §§ 105.38-.39 (West 1977 & Supp. 1986). But see FLA. STAT. ANN. § 373.016(3) (West Supp. 1986) (discussed at *infra* note 42).

42. Florida has followed this type of approach. The Florida permit act sets up water management districts, which are responsible for administering the permit system. But the Department of Environmental Regulation, a state agency, has the power to review and, where appropriate, rescind the districts' decisions. See FLA. STAT. ANN. §§ 373.016, .019, .023, .026, .069, .073, .083 (West 1974 & Supp. 1986).

43. The history of recent reform efforts in Virginia demonstrates this point. Opposition to legislation proposed in 1982 began almost immediately after its introduction. At public hearings held in water-rich areas of the state, speakers expressed their anger at the prospect of others taking "their" water. See VA. WATER RESOURCES RESEARCH CENTER, 13 WATER NEWS, No. 11, at 8 (Nov. 1982). This strong opposition prompted the Virginia State Water Study Commission to decide not to recommend introducing the legislation the following year. VA. WATER RESOURCES RESEARCH CENTER, 14 WATER NEWS, No. 2, at 2 (Feb. 1983).

44. For further discussion of this point, see *infra* notes 132-37 and accompanying text.

policymaking from the administrator to a democratically more responsive body, the legislature.

The second issue, determining how to allocate water resources, also raises important considerations not directly related to efficiency. An allocation system that is efficient but unjust, for example, would create serious opposition and dissatisfaction. To be acceptable and, therefore, effective, the distribution system should be equitable or fair from both a substantive and a procedural perspective. In addition, if the allocation system redistributes water rights to encourage present use, as most comprehensive reforms do, then the system should recognize and attempt to address the impact of redistribution on the future development of rural localities. Water-rich rural areas will oppose such an allocation system unless it protects their future interests and needs. Many comprehensive measures inadequately consider these concerns.

Furthermore, a water system can allocate water resources only after its proponents define and choose among competing policy concerns. When the system fails to clearly define for the decisionmaker intangible policy choices, like those involving environmental matters, the allocation process becomes more subjective and thus more unacceptable to various interest groups. Unlike the state legislature, the decisionmaker does not represent the aggregate of state interests and concerns. Faced with ill-defined policy choices, a decisionmaker cannot reach with certainty a decision acceptable to the majority. More so than the collective decision of legislators, the decisionmaker's policy choice often will reflect personal interpretations and thoughts about the conflicting values at stake.⁴⁵

The discussion of these two key issues of comprehensive water reform should demonstrate that economic analysis, though important, should not be the sole or primary determinant of water allocation decisions. The remaining portions of this article identify and evaluate the key factors and policies that a governing body should consider in developing a responsible, balanced water allocation and management system. Only by seriously considering all relevant concerns can a state develop a water system that provides for use while defining and incorporating the notion of a water ethic. Only by providing for nonefficiency as well as efficiency concerns can the law ensure that water is not misused to the detriment of present and future generations and to the detriment of the wildlife and natural communities dependent on it.

45. This observation demonstrates that the two key issues identified above are not independent inquiries, but rather are closely related. Because the allocation system involves distributing scarce resources, it cannot satisfy everyone. The identity of the decisionmaker who will decide key allocation issues and implement the choices thus becomes crucial to the success of the system. Parties dissatisfied with the allocation process might blame the decisionmaker and oppose the entire system.

II. THE ROLE OF EFFICIENCY IN WATER ALLOCATION SYSTEMS

As in other areas of property law,⁴⁶ efficiency should play a fundamental role in shaping water resources law.⁴⁷ Man relies heavily on water resources for many domestic and industrial uses.⁴⁸ Even in traditionally water-rich states, water resources are becoming scarcer.⁴⁹ Water use increased twenty percent during the 1970's, with the daily per capita rate rising to 2,000 gallons.⁵⁰ Since the turn of the century, the country's per capita water use rate has risen 500-800%.⁵¹ Without an efficient allocation system, America will experience increasing difficulty meeting the growing demand for water.

But while efficiency is vital, it is not clear whether efficiency should be the overriding or sole objective of a water allocation system. Nor is it clear what methods will best promote efficiency. Much of the confusion surrounding the role of efficiency arises because the concept is imprecise. Proponents of comprehensive water reform generally do not define efficiency; rather, they use the term in a broad, nontheoretical sense to signify any affirmative, generally productive use of water. Implicit in this approach is the idea that the efficiency of a particular use depends in some vague way on a weighing of its costs and benefits.

The Model Water Code illustrates the imprecision of the efficiency concept in its provisions governing new permits. Under the Model Water Code, reasonable-beneficial use is one of the key criteria for granting permits.⁵² Although the Code defines that standard as a use of water "in such a quantity as is necessary for economic and efficient utiliza-

46. For a discussion of the role of efficiency in property law, see R. POSNER, *ECONOMIC ANALYSIS OF LAW* ch. 3 (2d ed. 1977).

47. See generally 1 *WATERS AND WATER RIGHTS* §§ 60-64 (R. Clark ed. 1967 & Supp. 1978) (discussing economics and its relation to water law) [hereinafter cited as R. CLARK]; C. MEYERS & R. POSNER, *MARKET TRANSFERS OF WATER RIGHTS: TOWARD AN IMPROVED MARKET IN WATER RESOURCES* (National Water Comm'n 1971) (discussing a market approach to water rights).

48. According to one study, an average family of four consumes approximately 87 gallons of water per day for purposes of cooking, cleaning, bathing, and waste disposal. See 1 *U.S. WATER RESOURCES COUNCIL*, *supra* note 1, at 32. Cf. W. COX, L. SHABMAN, S. BATIE & J. LOONEY, *VIRGINIA'S WATER RESOURCES: POLICY AND MANAGEMENT ISSUES* app. D-5 (1981) (estimating average domestic use at 64 gallons per day). Industrial uses of water range from 100 gallons per day per employee in the printing and publishing industry to 163,000 gallons per day per employee in the petroleum field. *Id.* app. C-2.

49. Since the mid-1970's, significant portions of the eastern United States have experienced severe droughts. See generally *Effects of the Drought on Small Business and Agriculture: Hearings Before the Select Committee on Small Business*, 95th Cong., 1st Sess. (1977); *Water Resources Problems Affecting the Northeast; The Drought, and Present and Future Water Supply Problems: Hearings Before the Subcomm. on Water Resources of the Comm. on Public Works and Transportation*, 97th Cong., 1st Sess. (1981); NATIONAL WATER SUMMARY 1983, *supra* note 3.

50. NATIONAL WATER SUMMARY 1983, *supra* note 3, at 28.

51. *War Over Water: Crisis of the '80's*, U.S. NEWS & WORLD REPORT, Oct. 31, 1983, at 57. The population, however, increased only 200% for the same time period. *Id.* The rates of water withdrawal and population growth compare similarly. During the period from 1950 to 1980, the country's withdrawal of water from surface and ground waters increased 250%, while its population only rose 150% for the same time period. NATIONAL WATER SUMMARY 1983, *supra* note 3, at 28.

52. MODEL WATER CODE, *supra* note 13, § 2.02(1)(a). In addition, the proposed use of water

tion,"⁵³ the Code provides little guidance as to the meaning of economic or efficient use. The Code commentary explaining the reasonable-beneficial use standard states that "the quantity of water used must be efficient with respect to the use itself."⁵⁴ This requirement is, as the drafters of the Code explain, "a test of economic efficiency with water being regarded as a raw material."⁵⁵ As the drafters further note, however, the efficiency test focuses only on the quantity of water involved in the intended use. The test does not require the decisionmaker to consider "the value of the use itself in relation to other uses. . . . Nor does the test require that a permit be denied" for an intended use because "the ultimate dollar value produced per gallon of water used" would be greater for other uses.⁵⁶

Proponents of comprehensive reform typically maintain that, despite its limitations, their allocation standard achieves a more productive use of water resources than the common law approach.⁵⁷ As support, they point to the uncertainty and confusion of the common law approach, a system which has had more than enough time to develop a manageable set of principles.⁵⁸ In the water-rich East, for example, the common law system measures the quantitative use rights of a party holding water rights in terms of a reasonable use standard. Because that standard, in turn, depends upon the needs of other parties with water rights, the lawfulness of a particular use may vary over time as conditions and circumstances change.⁵⁹ The reform proposals, on the other hand, avoid such comparisons and offer the prospect of greater user security.

cannot interfere with an already existing legal use, and it must be compatible with the public interest and the state's water plan. *Id.* § 2.02(1)(b), (c).

53. *Id.* § 1.03(4).

54. *Id.* commentary at 171; *see also id.* § 1.03(4) commentary at 86 (drafters explain that the reasonable-beneficial use rule requires both a reasonable use and an "efficient economic use of water . . .").

55. *Id.* commentary at 171.

56. *Id.*

57. *See Ausness, supra* note 6, at 547, 589; Maloney & Ausness, *supra* note 5, at 524-29. The drafters of the Model Water Code, for example, maintain that the common law system applicable in many eastern states creates inefficiency because the validity of a particular use varies according to the surrounding facts and circumstances and only litigation can establish validity. Furthermore, water rights holders need not exercise their rights to retain them and thus can upset the "water use patterns of established industries" when they eventually exercise their rights. MODEL WATER CODE, *supra* note 13, commentary at 156. Although the common law system applicable in many western states defines water rights with more certainty, it also causes inefficient uses. Because that system gives priority to those uses begun "first-in-time," the system prefers more senior users—or appropriators—in a shortage, sometimes to the exclusion of junior appropriators. Also, once an appropriator has begun a use, it has little incentive to stop or curtail the use, even if it does not need all the water being used. The consequence of failure to use the water could be loss of rights. *Id.* commentary at 158-59. *See generally id.* at 156-60.

58. *See Ausness, supra* note 6, at 552-53; Maloney & Ausness, *supra* note 5, at 524-29.

59. The common law principles governing use of surface waters in the eastern United States collectively are known as the riparian doctrine. For an in-depth discussion of the riparian doctrine, *see Butler, supra* note 7. The common law system that developed in the West is known as the prior appropriation doctrine. For a discussion of both common law doctrines, *see MODEL WATER CODE, supra* note 13, at 75-81, 156-60.

Problems arise, however, from any efficiency standard that fails to weigh the aggregate costs and benefits of alternative uses.⁶⁰ Using the concept of "efficiency," replete with all its connotations,⁶¹ in such a restrictive and artificial manner is misleading. This restrictive definition would be less troubling if the reformists advocated free, or even limited, transferability of use rights. With free alienation, holders of use rights could shift their rights to more efficient users.⁶² But because the reform proposals typically prohibit transfers,⁶³ alternative uses generally are not compared, either through the permit process or the marketplace.

Aside from the vagueness of the efficiency concept, the current comprehensive reforms suffer from three principal shortcomings common to comprehensive planning efforts.⁶⁴ One weakness of the comprehensive proposals is their presumption that the principal decisionmaker has a vast pool of information already available to it or at least easily obtained.⁶⁵ One comprehensive water proposal assumes, for instance, that the agency administering the permit system knows or would be able to find out about

existing water resources of the Commonwealth, means and methods of conserving and augmenting such water resources [sic], existing and contemplated needs and uses of water for protection of the environment, procreation of fish and wildlife, recreational use, improvements of water quality, irrigation, mining, power development, and domestic, municipal, and industrial uses, and all other related subjects including drainage, reclamation, floodplain zoning, and selec-

60. To the extent that two parties apply for permits that would produce competing, conflicting uses, the comprehensive reforms admittedly do consider alternative uses. Under the Model Water Code, the appropriate governing board must approve the use that "best serves the public interest." MODEL WATER CODE, *supra* note 13, § 2.05. In upholding this standard, the governing board may negotiate and reduce the amounts requested by each applicant in order to satisfy both. If this solution is unsatisfactory, the governing board may grant the permit for the use that would most likely benefit the public and public bodies. The Board may weigh the economic productivity of the proposed uses, as well as environmental concerns and other similar factors within its discretion. *Id.* § 2.05(1) commentary at 188.

61. For an introduction to the efficiency concept and to the fundamentals of economic analysis, see R. POSNER, *supra* note 46, §§ 1.1-3. See also B. ACKERMAN, *ECONOMIC FOUNDATIONS OF PROPERTY LAW* vii-xvi (1975).

62. For a discussion of the alienation issue, see Butler, *supra* note 7, at 137-56. See also C. MEYERS & R. POSNER, *supra* note 47, at 2-7; R. POSNER, *supra* note 46, § 3.11, at 56-58.

63. See, e.g., MODEL WATER CODE, *supra* note 13, at 173-77. Some reforms permit transfers, but only in special or exceptional circumstances. See MISS. CODE ANN. § 51-4-11(2) (Supp. 1986) (no transfer without Mississippi Board of Water Commissioners' approval); N.J. STAT. ANN. § 58:1A-8(g) (West 1982) (transfer subject to the consent of the Department of Environmental Protection but only for the identical use of water as the transferor). But see IOWA CODE ANN. § 455B.273 (West Supp. 1986) (no conditions for transferring a permit when ownership of land described in the permit is transferred).

64. For a more detailed discussion of these arguments and of the desirability for comprehensive planning in general, see Butler, *Commentary on the Proceedings of the Water Rights Symposium*, 24 WM. & MARY L. REV. 767, 787-93 (1983).

65. L. SHABMAN, *PLANNING AND MANAGING VIRGINIA'S WATER RESOURCES: BASIC ISSUES 1* (Feb. 1983) (available from Virginia Cooperative Extension Service at Virginia State University and at Virginia Polytechnic Institute and State University).

tion of reservoir sites.⁶⁶

Much of this information will be difficult to obtain. Given the budgetary constraints facing state governments generally,⁶⁷ as well as the high costs of implementing a comprehensive permit system more specifically,⁶⁸ states might well underfund these information-gathering activities.

Moreover, even if a decisionmaker could obtain all relevant information, it still would face the formidable task of transforming the information into a comprehensive water plan.⁶⁹ The decisionmaker would be required to evaluate the scientific data and integrate it with relevant legal principles. The decisionmaker also would need to resolve scientific, legal, and policy issues to achieve identified policies and directives.⁷⁰ Even the process of developing standards and procedures to govern specific types of uses would be time-consuming and difficult. The difficulties involved are illustrated by considering the development of standards to regulate withdrawals and transfers of surface waters.⁷¹ Among other factors, effective standards must weigh present and projected water needs in the regions affected by a transfer, the potential effects of the transfer on land use in the areas of origin and destination, and the environmental costs associated with the transfer of water out of a watershed, with the transfer of water into an area, and with the building of various diversion and impoundment structures.⁷²

66. Virginia Water Law, H.B. 1420, § 62.1-212(A), 1981 Va. Gen. Assembly, Reg. Sess. (available from Virginia House of Delegates, Legislative Information Office) [hereinafter cited as Proposed Virginia Water Law]. The quoted provision is based on MODEL WATER CODE, *supra* note 13, § 1.07(1).

67. See, e.g., Address of Charles S. Robb, Governor, to the Virginia General Assembly, S. DOC. NO. 1, at 2-3 (1983) (proposing cutbacks to deal with budgetary problems). One state institution especially affected by Virginia's budgetary problems is the Virginia Water Resources Research Center. The Center has had difficulty obtaining funding; when programs are cut, it is one of the first victims. See Butler, *supra* note 64, at 788.

68. For further discussion of the impact of financial problems on comprehensive reform, see *infra* notes 90-91 and accompanying text.

69. See L. SHABMAN, *supra* note 65, at 1-2; White, *Environment*, 209 SCIENCE 183 (1980). For instance, the Proposed Virginia Water Law quoted in the text requires the State Water Resources Board to "progressively formulate an integrated, coordinated program for the use and development" of the state's waters. Proposed Virginia Water Law, *supra* note 66, § 62.1-212(B).

70. The directives of the Virginia bill include "the attainment of maximum [sic] reasonable-beneficial use of water . . . proper economic development of the waters . . . control of the waters of the Commonwealth for such public purposes as navigation, drainage, sanitation, and flood control . . . attainment of adequate water quality . . . and . . . implementation of the water resources policy expressed . . ." in the bill. Proposed Virginia Water Law, *supra* note 66, § 62.1-213.

71. The Model Water Code defines surface water as including "contained surface water," or "water upon the surface of the earth in bounds created naturally or artificially," and "diffused surface water," or "water occurring upon the surface of the ground other than in contained waterbodies." MODEL WATER CODE, *supra* note 13, § 1.03(10). For other definitions of surface water, see IND. CODE ANN. § 13-2-1-4(1) (Burns 1981); MISS. CODE ANN. § 51-3-3(b) (Supp. 1986); 3 H. FARNHAM, THE LAW OF WATERS AND WATER RIGHTS §§ 877-878 (1904). In contrast, ground water includes the water "beneath the surface of the ground, whether or not flowing through known and definite channels." MODEL WATER CODE, *supra* note 13, § 1.03(9); see also IND. CODE ANN. §§ 13-2-1-4(2), 13-2-2-1 (Burns 1981).

72. The Army Corps of Engineers considered many of these factors, at least from a federal perspective, when the Corps reviewed a withdrawal and transfer plan proposed by a Virginia municipality, the City of Virginia Beach. After considering the plan, the Corps reached the following key

A second weakness of the comprehensive reforms follows from the first. Because needed information will be missing, the decisionmaker will likely prepare a comprehensive water plan that will magnify the probability and consequences of erroneous decisions. This problem of error-magnification will be especially serious when the comprehensive reforms do not clearly formulate key policies and procedures for the decisionmaker.⁷³ To minimize the risk and effects of erroneous decisions, decisionmakers should proceed in small steps until the necessary information is available and until the legal principles are crystallized. With an incremental approach, decisionmakers can better assess and minimize the consequences of their actions.⁷⁴

A third weakness of the comprehensive reforms is that they tend to place primary responsibility for making key allocation and management decisions in a state agency, cabinet, or department.⁷⁵ Because such a body usually consists of appointed officials, it often is not representative of the citizenry. Yet many of the policy issues facing the decisionmaker raise a wide range of interests and concerns. Resolving these issues to the

findings. First, the navigability of the affected waters would not be impaired because existing minimum flows and levels would remain unchanged. Second, although the transfer could affect some existing water supplies by lowering the water level, the plan would not have a significant impact on the levels or, more generally, on the hydrologic cycle. Third, the proposed transfer should not affect water quality because the transported water would represent a very small percentage of the total water in each affected water basin. Fourth, wetlands, fish, and wildlife would not suffer irreversible harm as a result of the project. Once construction was completed, vegetation should grow back quickly, and various measures proposed by Virginia Beach should minimize the impact on fisheries. Fifth, those cities presently using several nearby waters would not suffer diminished or damaged supplies in any way. Finally, most of the other projected costs of the project, like falling real estate prices, would be short-term problems and should correct themselves over time. See Army Corps of Engineers, Norfolk District, Statement of Findings in Permit Application No. 83-0747-06 (Jan. 9, 1984); Army Corps of Engineers, Norfolk District, Announcing the Availability of a Final Environmental Assessment and Finding of No Significant Impact in Permit Application No. 83-0747-06 (Dec. 7, 1983). Based on these findings, the Corps decided to issue the appropriate permit. In 1984 the City of Virginia Beach preemptively filed two declaratory judgment actions to determine the validity of its plan and the issuance of the permit by the Corps. Shortly thereafter, the state of North Carolina brought suit against the Army Corps of Engineers, alleging that the Corps improperly granted the permit. See *North Carolina v. Hudson*, No. 84-36-CIV 5 (E.D.N.C. filed Jan. 12, 1984); *City of Virginia Beach v. Champion Int'l Corp.*, No. 84-10-N (E.D. Va. filed Jan. 9, 1984); *City of Virginia Beach v. Roanoke River Basin Ass'n*, No. 84-11-N (E.D. Va. filed Jan. 9, 1984) (transferred to North Carolina and dismissed Dec. 17, 1985, No. 85-1625-CIV 5).

73. When key policies, standards, and procedures are vague, the decisionmaker must reach decisions not only without perfect information, but also with little guidance on important policy matters. Thus, parties are more likely to challenge a decision because they have more reasons to be dissatisfied with the decision, both on factual and policy grounds. For examples of vague policies and procedures found in comprehensive reforms, see *infra* notes 132-37 and accompanying text.

74. See L. SHABMAN, *supra* note 65, at 2. See generally C. LINDBLOM, *THE INTELLIGENCE OF DEMOCRACY: DECISION MAKING THROUGH MUTUAL ADJUSTMENT* (1965); W. OPHULS, *ECOLOGY AND THE POLITICS OF SCARCITY* 191-95 (1977).

75. See Trelease, *New Water Legislation: Drafting for Development, Efficient Allocation and Environmental Protection*, 12 LAND & WATER L. REV. 385, 410-11 (1977). For example, the Proposed Virginia Water Law gives the Board primary responsibility to determine whether applicants meet the reasonable-beneficial standard, as well as whether the proposed use will interfere with a present legal use and whether it is consistent with the policies and provisions of the State Water Plan. Proposed Virginia Water Law, *supra* note 66, § 62.1-234. See also KY. REV. STAT. ANN. §§ 151.125, .170 (Bobbs-Merrill Supp. 1986).

satisfaction of all interested parties probably would be impossible, especially when the decisionmaker distributes scarce and vital resources. The legislature or some other democratically responsive body would appear better suited to the role of policymaker,⁷⁶ at least in developing an allocation system for those resources. Although such a body may not reach a policy choice satisfactory to all interested parties, the parties should be more willing to accept an unsatisfactory policy decision reached through the democratic process. A comprehensive reform plan that fails to adopt a democratically responsive policymaker would be more likely to generate hostility and resentment. These reactions, in turn, would detract from the effectiveness and efficiency of the allocation process.

These three deficiencies in current reform proposals seem, on the surface, weighty enough to condemn the proposals. A closer examination of the three criticisms, however, suggests that their persuasiveness actually depends on the nature of the market already existing for the resource regulated by the comprehensive reform. Where a market for the exchange of use rights already exists, the market promotes a certain level of efficiency by permitting parties to get out of inefficient uses. Because of its three principal shortcomings, comprehensive reform is not likely to increase that efficiency. But where a market for the resource does not exist and could not be created with ease, the current level of efficiency is probably low and the three deficiencies in comprehensive reform lose some of their persuasiveness. The absence of a ready market for a resource prevents parties from exchanging interests in the resource and thus from shifting resources to more efficient uses.⁷⁷ The benefits of reform, therefore, seem greater.

Historically, a ready market for resource use rights has not developed when the resource or interest is intangible or difficult to value. Water provides an example of such a situation.⁷⁸ Although tangible,

76. See L. SHABMAN, *supra* note 65, at 2. See generally C. LINDBLOM, *supra* note 74; W. OPHULS, *supra* note 74. Some commentators contend, however, that creating interest group competition in the legislature is undesirable in the natural resources area for several reasons. First, because the stakes in land use decisions tend to vary from party to party, whether a party voices its concern effectively will depend on the strength of a party's interests and not on the merits. Second, because some interested parties lack the resources to conduct effective lobbying, the legislature might ignore important interests. Edwards, *Land Use and Government in Virginia*, in THE VIRGINIA ASSEMBLY ON LAND USE POLICIES: ISSUES FOR THE COMMONWEALTH (1982). See generally Mashaw, *Prodelegation: Why Administrators Should Make Political Decisions*, 1 J.L. ECON. & ORGANIZATION 81 (1985) (discussing why administrators, and not legislators, should make important policy choices).

77. See generally R. POSNER, *supra* note 46, § 3.11 (discussing the importance of free transferability to furtherance of the efficiency objective).

78. Certain environmental values, like the interests in clean air and the preservation of forests, provide another example. Because these values are difficult to define and to measure through quantitative terms, markets for environmental concerns have not developed. In order for a resource market to develop, one party must have both a demand for the good and the willingness to pay the price of supplying the resource. For interests like clean air, the price either is exorbitantly high or is not readily measurable or apparent. Furthermore, at least until recently, when the quality of air began to deteriorate noticeably in many regions of the country, most people were unwilling to pay for the right to use air. Because the resource is available to all, people did not perceive a need to pay for the

water is a transient resource, not easily possessed by any one party. Furthermore, its supply is determined by natural processes and is generally beyond the control of man.⁷⁹ Due to the physical characteristics of water, parties often find the process of valuating the costs and benefits of various water uses to be difficult, time-consuming, and expensive.

The common law has failed to overcome these valuation problems and to give rise to a free market for water rights.⁸⁰ In the many water-rich states that still apply the common law, water use rights are closely tied to the ownership of waterfront lands. The owner of land adjoining a watercourse possesses the right to make reasonable use of the watercourse as an incidence of his land ownership rights.⁸¹ Although the holder of these water rights, called riparian rights,⁸² generally can sever and transfer the rights to a party without transferring the land itself,⁸³ some significant limitations exist. For instance, the common law would not allow a party who purchased riparian rights to withdraw water from the watercourse and transfer it to land outside the watershed. Such a transfer, called an "interbasin" transfer, would not be a market option under the common law.⁸⁴ Nor could a riparian transfer the value of the return flow generated by a particular use. Under the common law a riparian had no interest in the return flow generated by her water use and thus could not consider that value in evaluating various use options.⁸⁵

air that they used. Thus, until pollution became an obvious problem, there was no incentive to develop a market for clean air. *See generally* R. POSNER, *supra* note 46, §§ 1.1, 3.6, 13.5 (discussing a market approach to pollution).

79. Trelease, *Policies for Water Law: Property Rights, Economic Forces, and Public Regulation*, 5 NAT. RESOURCES J. 1, 39-42 (1965) (discussing imperfections in a market approach to water rights).

80. It is not clear whether traditional common law principles developed in response to the valuation problems. In all likelihood, water rights were closely tied to the ownership of waterfront land in order to ratify the expectations of waterfront landowners who paid a premium for the land's location. Apparently, problems in creating a market for water rights were not involved. For further discussion of the relationship between land settlement patterns and traditional common law principles governing water use, see Butler, *supra* note 7, at nn.36-37 and accompanying text.

81. *See* Stratton v. Mt. Hermon Boys' School, 216 Mass. 83, 88-89, 103 N.E. 87, 89 (1913); Bouris v. Largent, 94 Ill. App. 2d 251, 254, 236 N.E.2d 15, 17 (1968). *See generally* 1 H. FARNHAM, *supra* note 71, §§ 62-64; Butler, *supra* note 7.

82. The two key tenets defining and limiting riparian rights are that holders of the rights must exercise the rights for the benefit of riparian land and that any use conducted pursuant to the rights must be reasonable. *See generally* Butler, *supra* note 7.

83. *See, e.g.,* Texas Co. v. Burkett, 117 Tex. 16, 25-26, 296 S.W. 273, 276-77 (1927); Thurston v. Portsmouth, 205 Va. 909, 912-15, 140 S.E.2d 678, 680-82 (1965); Waverly Water-Front & Improvement Co. v. White, 97 Va. 176, 33 S.E. 534 (1899). *See generally* Butler, *supra* note 7, at 137-56 (discussing the severability rule).

84. The courts have relied upon several explanations to declare interbasin transfers invalid. One explanation is that the transfers violate the requirement that holders of riparian rights must exercise their rights for the benefit of riparian land. *See* Harvey Realty Co. v. Borough of Wallingford, 111 Conn. 352, 358-59, 150 A. 60, 63 (1930); Gordonsville v. Zinn, 129 Va. 542, 558-59, 106 S.E. 508, 514 (1921). A second explanation is that interbasin transfers are *per se* unreasonable. *See* Purcellville v. Potts, 179 Va. 514, 521, 19 S.E.2d 700, 703 (1942); Roberts v. Martin, 72 W. Va. 92, 94, 77 S.E. 535, 536 (1913). Even under traditional principles, however, exceptions to the "no-diversion" rule exist. For a discussion of these exceptions and for a more thorough discussion of the no-diversion rule, see Butler, *supra* note 7, at 156-79.

85. Posner suggests that, at least in the context of western water law, the value of the return

Thus, the common law governing surface water use in many water-rich states creates, at best, a partial market for water rights.⁸⁶

Comprehensive reforms might create more complete markets for rights and interests in watercourses. To be effective, however, the reforms must grant water users sufficient flexibility to respond to changed circumstances and to shift resources to more efficient uses. Comprehensive systems to date generally have lacked this flexibility, in part because they have attempted to achieve a uniform regulatory system.⁸⁷ More importantly, these systems generally do not allow free transferability of permit rights,⁸⁸ and the reforms typically do not recognize a use's return flow as an interest of the permit holder.⁸⁹ An efficient system of ex-

flow generated by a particular use should be considered the right of the party conducting the use. R. POSNER, *supra* note 46, § 3.11, at 56-57. For an extension of this proposal to eastern water law, see Butler, *supra* note 7, at 150-51.

86. A similar conclusion is possible for the common law allocation system prevalent in many western states. Because that common law system gives priority to users according to when their use began, it defines water rights more clearly and thus may create a better market for water rights. Like the riparian doctrine, however, the western system also fails to recognize return flow. Further, although some western states permit transfers of water rights, high transactional costs and complex judicial proceedings appear to inhibit transfer activity. See C. MEYERS & R. POSNER, *supra* note 47, at 8-15, 27-32.

87. The comprehensive systems also are less flexible because of the reformists' desire to create a clearer, more certain water allocation system. By defining water use rights more clearly, reformists hope to lower the costs of conducting a use and thus to encourage investment activities. See MODEL WATER CODE, *supra* note 13, commentary at 173 (discussing need for certainty). But cf. Ausness, *supra* note 6, at 576-89 (discussing deficiencies in present water permit systems).

88. See, e.g., MODEL WATER CODE, *supra* note 13, commentary at 173-75 (discussing decision to prohibit transfers). But see IOWA CODE ANN. § 455B.273 (West Supp. 1986) (generally allowing transfers of permit rights as appurtenances to land); C. MEYERS & R. POSNER, *supra* note 47, at 25-27 (advocating free transferability of riparian rights). Professor Trelease points out the inefficiencies of the present permit approach by hypothesizing a situation in which a water shortage develops in an agricultural area. He assumes that bean growers hold junior permit rights which would not entitle them to any water, while potato growers have senior rights which would give them a supply. He also assumes that the beans would receive a high price on the market and that the potatoes would receive a low price because of a glutted market. Under a market approach, an efficient use of water could result because the bean growers could purchase water from the potato farmers. A typical permit statute often would not achieve an efficient result. Even assuming that the shortage is serious enough to give the administrator of the permit system the power to intervene, many permit statutes still restrict the administrator's power to act. For instance, the administrator may have to distribute the water equally, an outcome that may be inefficient. Or, if the statute prefers the most economic use, the administrator would have to allocate all available water to the bean growers, without compensating the potato farmers. Trelease, *supra* note 75, at 412-15.

Another problem with many of the permit systems is the relatively short duration of the permit period. Although short permit terms allow greater flexibility of administration than do long terms, short terms do not provide sufficient incentive for major investments. Business users are more likely to invest in an area where their water rights are certain. The task of determining the ideal length of the permit period admittedly is difficult, if not impossible. The problem identified above suggests that the term at least should allow sufficient time for a business to amortize its investments. If this approach is followed, however, the permit term would have to vary according to the intended use. See MODEL WATER CODE, *supra* note 13, at 173-74; Ausness, *supra* note 6, at 584-87.

89. For example, the Kentucky permit statute provides that permits must specify "quantity, time, place and rate of diversion" and "[s]uch permits represent a limited right of use and do not vest ownership nor an absolute right to withdraw or use the water." KY. REV. STAT. ANN. § 151.170 (Bobbs-Merrill Supp. 1986). This provision limits permit holders in their use of water and thus in their use of any return flow that their conduct generates. But cf. C. MEYERS & R. POSNER, *supra* note 47, at 27-32 (discussing need to consider value of return flow).

change would allow free alienation and would recognize the value of the return flow generated by a particular use as one of a permit holder's rights.⁹⁰

The above suggestions admittedly would not solve the financial problems raised by a new allocation system. They may provide the structural framework for new water markets, but they would not provide the capital needed to set up and implement that system. Some alternatives do exist, however, for raising the necessary revenues. Among other options, a state could assess a special levy on all water users and, once a sufficient amount is raised, could employ the money to implement the new system.

In light of the financial, political, and administrative problems raised by comprehensive water reforms, it would seem that a state could create a more complete water market in a simpler manner—by altering the common law rules to allow free alienation of water rights and to account for return flow. Such an approach would cost far less than comprehensive reforms and would eliminate some of the inefficiencies of a state-controlled market.⁹¹ Though appealing, this simpler approach also has its problems. One principal weakness is that the suggested common law changes would not create an adequate market by themselves. Some additional planning and policy development would still be necessary for the obvious reason that the common law system today lacks rules to govern the altered situations. A new rule allowing interbasin transfers, for example, would lack the necessary supporting principles and procedures because such transfers conflict with the thinking now embodied in the common law.

Furthermore, water rights transfers occurring under a modified common law regime would generate greater transaction costs than transfers conducted under a carefully drafted comprehensive system. Because this more moderate approach would retain most of the common law principles, a buyer in a riparian jurisdiction could not be certain, for example, whether and for how long a planned use would be reasonable. As noted above, a riparian can only conduct a use that is reasonable in light of surrounding facts and circumstances. Because the reasonable use standard is uncertain, it imposes greater investigation costs on the potential buyer, who must study the various uses made in the area as well as the size of the watercourse and its seasonal flows in order to assess the

90. Other policies and concerns, however, may require that a water user's ability to transfer its rights be subject to approval by the appropriate government agency. These other policies and concerns are discussed in *infra* text accompanying notes 95-176.

91. Perhaps one of the best examples of such inefficiencies is the federal government's plan to sell and lease federal lands. In addition to its status as the largest-scale activity of its kind in years, the plan focuses on development almost to the exclusion of environmental concerns. Because the plan significantly increases the amount of land on the market and ignores environmental losses, some observers maintain that the plan would not be as cost effective as the projected sales revenues might suggest. See Shabecoff, *U.S. Plans Biggest Land Shift Since Frontier Times*, N.Y. Times, July 3, 1982, at 1, col. 1.

chances that a proposed use will become unlawful. If the chance of illegality is too high, the buyer could proceed without fear of litigation only by buying out the rights of competing riparians on the watercourse.⁹² This process, in turn, would raise transaction costs and could lead to unreasonably high prices if holdout riparians are present.⁹³ In contrast, a comprehensive reform system could define the rights being purchased in advance and with greater clarity and certainty.⁹⁴

But even a comprehensive reform system would impose transaction costs and would raise problems not existing under the alternative approach, the modified common law system. For instance, a potential buyer would incur costs in going through the permit process and negotiating with the government as well as with the seller. Furthermore, a comprehensive reform can achieve benefits only if drafted and implemented to overcome the three problems discussed above. When sufficient information and expertise exist, long-range planning and reform should prove both desirable and feasible. To determine whether a particular state is ready for such action, lawmakers should decide whether the relevant issues are clearly defined and researched and whether missing information is within the reach of available resources and technology. The lawmakers also should evaluate the extent to which legal and scientific principles have been defined and accepted, the ability of the decisionmaker to integrate all relevant information, and the degree to which key policy choices are set. If under these factors a state is not ready for reform, then it is clear that comprehensive reform will not promote water use efficiency. In such a case, the question then becomes whether other policies and considerations nevertheless make comprehensive reform the more desirable option.

III. EQUITABLE CONSIDERATIONS AND THE CONSUMPTIVE NEEDS OF FUTURE GENERATIONS

Reform proposals have failed in many states because they have given inadequate consideration to equitable values and concerns. An equitable distribution of water resources is difficult to define—probably

92. For example, this situation might arise when a buyer plans to expand the seller's use considerably to increase the area benefited by the use.

93. The problem of holdout riparians is avoided when the government is involved and can initiate eminent domain proceedings. Through eminent domain proceedings, the government can limit the price that affected property owners receive. Such a solution does not exist, however, when only private parties are involved. A party purchasing the rights of riparians who would suffer injury under a proposed use initially might be able to maintain the price at fair market value. But, as the extent of the buyer's plans becomes known and as the buyer commits more resources to carrying out the plan, the buyer probably would encounter some "holdouts" who would demand, and often receive, a price far in excess of the actual opportunity cost of the land. See R. POSNER, *supra* note 46, § 3.5, at 40-41.

94. Permit acts typically require applicants for use permits to define specifically the scope of their intended use. Under the Iowa statute, for instance, an authorized permit must define the extent of the permitted "diversion, storage, or withdrawal of water" by setting forth the limits "as to quantity, time, place, and rate." IOWA CODE ANN. § 455B.261(10) (West Supp. 1986).

more difficult than an efficient allocation. To an extent, society can assess efficiency in terms of monetary exchanges in the marketplace; equity, however, involves intangible feelings of justice and fairness not easily measured by objective standards. In addition, a distribution that is equitable in a costless society may prove impracticable and inefficient when transaction costs are considered.

For the most part, the relevant equitable concerns raised by water law reform relate to fairness toward future water users. The following discussion undertakes to identify these equitable concerns. It attempts first to describe the characteristics of an equitable distribution of water resources. It then undertakes the easier and perhaps more productive task of identifying some of the feelings of hostility and injustice that have arisen in response to proposed, allegedly inequitable reforms.

A. *Defining an Equitable Distribution*

A system of distributing resources is equitable when it employs substantive allocation rules that are fair,⁹⁵ regardless of their efficiency in maximizing benefits and minimizing costs. Sometimes equity exists when a system divides resources equally among potential users.⁹⁶ This definition is not workable, however, unless the system makes the equal division when it first distributes the resource, and even then it may not be acceptable if the size of each user's share is not sufficient to allow beneficial use.⁹⁷ A later redistribution would ignore the prior work of present users and would raise strong feelings of resentment in those deprived of currently held resources. Further, if redistribution occurred regularly as new potential users arrived, the system would seriously discourage investment and thus would promote inefficient uses. Users would avoid substantial investments in a resource if their use rights were insecure.

Because of the difficulties in defining substantive equity, commentators and lawmakers often focus instead on the fairness of the process used to distribute the resource.⁹⁸ A formal, procedurally fair decision-making

95. See R. POSNER, *supra* note 46, §§ 1.2, 16.3 (discussing the meaning of the efficiency criterion and principles of distributive justice); Polinsky, *Economic Analysis as a Potentially Defective Product: A Buyer's Guide to Posner's ECONOMIC ANALYSIS OF LAW*, 87 HARV. L. REV. 1655, 1671-80 (1974) (discussing principles of efficiency and equity).

96. Under Rawls's theory of distributive justice, a distribution of resources would be just if no alternative would improve the position of those worst off in society. See generally J. RAWLS, *A THEORY OF JUSTICE* (1971). Posner concludes that Rawls's theory has "little operational content." R. POSNER, *supra* note 46, at 349 (footnote omitted). As Posner explains, Rawls's theory assumes that "most people are risk averse." *Id.* at 347. Furthermore, it raises the "problem of deciding who shall be counted as worst off." *Id.* at 349.

97. If a resource is scarce, an equal distribution may not permit anyone to use the resource productively. Cf. R. POSNER, *supra* note 46, § 16.2 (discussing the efficiency of inequality). Such a situation could easily arise in the arid West if a state used an equal distribution scheme, instead of the first-in-time standard, to allocate water rights. See generally MODEL WATER CODE, *supra* note 13, commentary at 75-81.

98. That focus typically begins with the due process clauses, which define the limits of acceptable government conduct. U.S. CONST. amends. V & XIV, § 1. By providing that the government cannot deprive any person of "life, liberty, or property, without due process of law," the Constitu-

process can ensure that all interested parties have an opportunity to participate in the allocation process and can give parties dissatisfied with a decision the feeling that the decision was at least reached fairly. Where a decision determines who is entitled to use a scarce resource, a fair process is the only way to minimize dissatisfaction with the decision. Formal, adversarial hearings replete with evidentiary requirements and conducted by a neutral third party can instill this sense of fairness and justice better than a less formal process.⁹⁹

A comprehensive reform should establish fair procedures to be followed during the allocation process. It also should carefully define the policymaking role of the government body administering the new allocation system. If the legislature leaves fundamental policy matters undecided, it invites resistance and conflict. Because of the importance of water resources, a democratically responsive body should be actively involved in making fundamental policy choices. Where the policymaker is accountable through the democratic process, interested parties have a means of expressing their sentiments and affecting the choice. Once the legislature resolves fundamental issues, it could delegate further decision-making responsibility to appointed officials.

Many of the reforms proposed to date fail to define clearly the procedures and standards for allocation. Often they merely offer vague guidance, counseling that a use be in the public interest¹⁰⁰ or that

tion ensures that the government may not arbitrarily redistribute resources. See generally Mashaw, *The Supreme Court's Due Process Calculus for Administrative Adjudication in "Mathews v. Elridge": Three Factors in Search of a Theory of Value*, 44 U. CHI. L. REV. 28 (1976).

99. For further discussion of the development of a planning and conflict resolution process, see Butler, *supra* note 64, at 790-93. See also Thibaut & Walker, *A Theory of Procedure*, 66 CALIF. L. REV. 541 (1978).

100. For instance, the Proposed Virginia Water Law authorizes interbasin transfers when they are in the "public interest." Proposed Virginia Water Law, *supra* note 66, § 62.1-235(A). Besides failing to define clearly what the "public interest" standard means, the bill uses the standard in a manner that raises questions about its relationship with the general permit standard. Because the bill uses the specific phrase "public interest" and because public interest is just one criterion a decisionmaker must consider under the more general permit standard, the bill seems to adopt a narrower and lower standard for interbasin transfer applications than for other permit requests. Basic rules of statutory construction indicate that each word of a statute should have effect unless a particular word is a mistake, is nonsensical, or nullifies the rest of the act. See *Burnette v. Commonwealth*, 194 Va. 785, 788-89, 75 S.E.2d 482, 484-85 (1953). Applying this rule to the Proposed Virginia Water Law leads to the conclusion that the bill contains a narrower standard for interbasin transfers. A contrary interpretation would make the "public interest" language in the interbasin transfer provision superfluous.

In addition to the above problems, the interbasin transfer provision creates ambiguity about the safeguards available for political subdivisions that would be the situs of the withdrawal and diversion. To be politically acceptable, the bill should include some protections for situs jurisdictions, which otherwise could lose important opportunities for development. As the bill now reads, it does not even clearly decide whether the situs jurisdictions would have the right of approval that Virginia law currently provides. Compare Proposed Virginia Water Law, *supra* note 66, § 62.1-235 with VA. CODE ANN. §§ 15.1-37, -332.1, -456, -875, -1250.1 (1981 & Supp. 1986) (giving situs jurisdictions the right to approve or disapprove water projects). Leaving the interpretation of standards as important as the above to a nonrepresentative state agency may improperly remove political choices from the political arena. Given the explosive and politically sensitive nature of the interbasin transfer issue, a vague standard would, not surprisingly, generate substantial opposition and hostility upon

procedures be developed.¹⁰¹ Legislatures must take a more active role in setting policy, defining key standards, and establishing formal decision-making procedures. If they do so, they can eliminate much of the opposition to water law reform.

B. Identifying Equitable Concerns

Another means to define the equitable concerns raised by water allocations is to identify some of the feelings of unfairness and injustice generated by the proposed reforms and the common law. Three principal groups have voiced frustration: water-rich jurisdictions, present holders of water rights, and water-poor jurisdictions.

1. Water-Rich Jurisdictions

Water-rich political subdivisions have raised several equitable objections to comprehensive reforms. Many water-rich localities are low-density, rural areas with substantial supplies of unused water. These localities fear that permit-granting authorities will distribute the unused water to outsiders, an action that would render water unavailable to the localities when important development opportunities arise in the future.

The opposition of water-rich jurisdictions stems in part from a mistaken belief that the jurisdictions have the right to control the waters within their boundaries for the exclusive benefit of their residents.¹⁰² Although the law does not support this belief,¹⁰³ equity or morality may.

adoption. Without further guidance from the legislature as to the meaning of "public interest," the state agency would find itself in the precarious position of trying to develop a neutral, rational definition that decisionmakers could apply in a consistent and fair manner.

101. Under the Proposed Virginia Water Law, for example, the drafters direct the state agency authorized to administer its provisions to "develop a procedure" for granting interbasin transfer requests. Proposed Virginia Water Law, *supra* note 66, § 62.1-235(B). The bill does not provide further guidance, however, as to what those procedures should be except to require that the General Assembly should receive notice of applications for interbasin transfers prior to issuance of a permit. *Id.* § 62.1-235(A). Given the strong objections raised by opponents of interbasin transfer, a legislative act that delegates full responsibility for such a politically sensitive matter to a state agency seems inappropriate. Requiring the agency that ultimately decides whether to allow an interbasin transfer to develop the procedures that it will follow in making its decisions seems to delegate too much control over important policy choices to a nonrepresentative body. *But see* Mashaw, *supra* note 76. Composed of seven citizens selected by the Governor and confirmed by the General Assembly, the proposed agency clearly would not represent the collective voice of the citizens of Virginia. *See* Proposed Virginia Water Law, *supra* note 66, §§ 62.1-202, -203. Although the legislature cannot possibly exercise day-to-day control over the state's agencies, it at least should provide sufficient guidance as to key standards and procedures. Other comprehensive reforms that fail to define key procedures include DEL. CODE ANN. tit. 7, § 6010 (1983); MD. NAT. RES. CODE ANN. §§ 8-203, -801, -802 (1983). *But see* FLA. STAT. ANN. §§ 373.026, .036, .0695, .073, .119, .171, .223, .229 (West 1974 & Supp. 1986).

102. *See, e.g.,* VA. WATER RESOURCES RESEARCH CENTER, 13 WATER NEWS, No. 11, at 8 (Nov. 1982).

103. For years scholars have debated the question of who owns flowing waters. 1 R. CLARK, *supra* note 47, § 16.1. *See generally* Trelease, *Government Ownership and Trusteeship of Water*, 45 CALIF. L. REV. 638 (1957) (discussing various theories of ownership of water). Today most commentators would agree that no one owns flowing water in its natural state. *See* 6A AMERICAN LAW OF PROPERTY § 28.55 (A. Casner ed. 1954). This position does not mean, however, that a party

Local residents must live with the environmental consequences of withdrawals and transfers of water.¹⁰⁴ They also may possess firm expectations about their ability to use local water and may have paid more for their land because of their locality's water resources.¹⁰⁵ Furthermore, local residents must live with the adverse effects of abundant water, which include flooding, swampy or marshy land, and disease-bearing insects.¹⁰⁶ If local residents bear the costs of having abundant water resources in their jurisdiction, they should in fairness enjoy the benefits as well.

Legislators contemplating reform could address the above concerns in several ways. If, for example, legislators authorize interbasin transfers, they could give water-rich jurisdictions priority of use over other jurisdictions. Alternatively, the legislature could ensure that water-rich jurisdictions received special consideration in determining whether to allow interbasin transfers. The legislators could adopt a provision, for example, that allowed interbasin transfers only in certain defined situations, and could even link approval for such transfers to the consent of the water-rich jurisdiction.¹⁰⁷ If the water-rich jurisdiction consents to the transfer, the granting agency could ignore other equitable concerns. If the water-rich locality does not consent, the decisionmaker could then weigh other appropriate factors to determine whether to permit the transfer despite the lack of consent. The decisionmaker should consider, in particular, the impact of the diversion on the future development of the water-rich jurisdiction. Although this case-by-case approach would

cannot have a lesser interest in those waters. For example, a riparian proprietor has the right to conduct reasonable uses of the adjoining watercourse and to control uses by other parties. The state also has an interest, as sovereign, which justifies its regulation of waters within its boundaries.

104. See *infra* note 145. See generally WATER POLICIES, *supra* note 5, at 19-37 (discussing environmental impact of water projects and water use); Hagan & Roberts, *Ecological Impacts of Water Storage and Diversion Projects*, in 1 ENVIRONMENTAL QUALITY AND WATER DEVELOPMENT 543 (C. Goldman ed. 1971) (discussing ecological effects of water projects).

105. To the extent that a buyer pays a premium for the location of land, a statute that deprives a waterfront landowner of the right to use the adjoining watercourse without compensation may raise a takings issue. Because traditional water law in many eastern states recognizes that a waterfront landowner has certain rights in the adjoining watercourse, the owner's expectation of future use appears to be both reasonable and vested. See *Petraborg v. Zontelli*, 217 Minn. 536, 545, 15 N.W.2d 174, 179 (1944). See generally Ausness, *Water Use Permits in a Riparian State: Problems and Proposals*, 66 KY. L.J. 191, 240-56 (1977).

106. Ever since the settlers first landed at Jamestown in 1607, waterfront residents of Virginia and other states have endured insects and other annoyances. See 1 P. BRUCE, *ECONOMIC HISTORY OF VIRGINIA IN THE SEVENTEENTH CENTURY* 128-39, 189-91 (1907) (describing problems faced by colonists settling in swampy Jamestown). Although medical advances have helped modern residents to escape the often fatal consequences of living on the water that befell their predecessors, damage from tropical storms remains a fact of life for coastal dwellers. The winds and high storm tides of Hurricane Camille, for example, caused an estimated \$1.4 billion in damages in 1969. Pore, *Storm Hazards*, in COASTAL ECOSYSTEM MANAGEMENT 722 (J. Clark ed. 1977) [hereinafter cited as J. CLARK].

107. In some states still adhering to the common law approach, statutes have incorporated the consent factor into certain aspects of the common law system. See, e.g., VA. CODE §§ 15.1-37, -332.1, -456, -875, -1250.1 (1981 & Supp. 1986) (giving local political subdivisions the right to approve or disapprove of certain water projects).

not promote an open market for water rights, it would allow the state to maintain control over interbasin transfers. State control can ensure that interbasin transfers do not "rob" water-rich areas of all development opportunities.

Further steps can alleviate the problems caused by transfers of water out of a water-rich jurisdiction. The legislature might require, for example, a jurisdiction requesting an interbasin transfer to pay a reasonable fee to the situs jurisdiction.¹⁰⁸ To ensure that the fee is fair, the legislature might link the amount of the payment to the expected value of a foregone development opportunity. This approach would enable the situs locality to realize at least some of the development opportunity lost because of the transfer.¹⁰⁹ To avoid a windfall, however, the payment amount should also reflect the fact that the lost opportunity is a speculative, future one. In addition, permits for interbasin transfers should require periodic reevaluation to ensure that the fee the transferee jurisdiction pays and the use it makes fairly reflect changing needs and expectations.¹¹⁰ Aside from the payment requirement, a state could require transferors to leave sufficient water in the water-rich area to account for reasonably foreseeable future uses in that area.

2. *Present Holders of Water Rights*

Present holders of water rights also have objected on equitable grounds to comprehensive reforms. Their principal concern is that a drastic change in how the state allocates water rights could deprive them of valuable property rights. To challenge the new allocation system, the present holders could attempt to establish that the comprehensive reforms arbitrarily regulate or interfere with present rights.¹¹¹ Further, if

108. Several comprehensive measures already have incorporated such a provision. Under the Model Water Code, for instance, "[e]very person who requires a permit" is subject to a "user-surveillance fee." MODEL WATER CODE, *supra* note 13, § 1.13(1). As the drafters explain in their commentary, the imposition of a fee reflects "the belief that the waters of the state belong to the people of the state and are for their use." *Id.* § 1.13 commentary at 121. Through the fee a state can monitor conduct "to insure reasonable use." *Id.* For other examples of fee provisions, see DEL. CODE ANN. tit. 7, § 6026 (1983) (to obtain well and waste licenses); N.J. STAT. ANN. § 58:1A-11 (West 1982) (for processing diversion permits).

109. For instance, the locality could invest the payments to help promote its own development. Under the Model Water Code the state treasury would receive the fee "for the use of the water management districts." MODEL WATER CODE, *supra* note 13, § 1.13(2).

110. Many reform measures do not contain continuing evaluation procedures, so reevaluation only occurs at permit renewal time. For instance, under the Proposed Virginia Water Law, the governing board has the power to revoke a permit for material false statements, for certain violations of the act or of permit conditions, or for nonuse of the water supply allowed by the permit for a period of two or more years. *See* Proposed Virginia Water Law, *supra* note 66, § 62.1-247. The Board also can change the terms of the permit during a water shortage. *Id.* § 62.1-248. The proposal does not require reevaluation, however, other than at renewal time. For other examples of permit systems with similar revocation provisions, see FLA. STAT. ANN. §§ 373.243, .246 (West Supp. 1986); GA. CODE ANN. §§ 12-5-31(k), (l) (Supp. 1986).

111. Traditionally states have used their police powers or express constitutional powers to justify regulating private property rights for the public good. *See, e.g.,* Board of Supervisors v. State Milk Comm'n, 191 Va. 1, 8, 60 S.E.2d 35, 39, *appeal dismissed*, 340 U.S. 881 (1950). *See also* Euclid

the comprehensive reforms substantially restrict present rights without compensation, they could argue that the reforms unlawfully burden present holders for the benefit of the public generally.¹¹² The due process and just compensation clauses of the United States Constitution generally protect property owners from state action that arbitrarily regulates their rights or that shifts property from private owners to the public without compensation.¹¹³

Even if comprehensive reforms overcome constitutional obstacles, the reforms will encounter serious fairness objections when states fail to pay full compensation. If a comprehensive system neither compensates present holders for the loss of their rights nor allows the present holders to continue existing uses, those parties could lose substantial investments. Current users would suffer actual losses; prospective users would forgo investments because they would lack the certainty needed to justify future investment activities.¹¹⁴ Thus, the reforms might stifle future activities and prove both counterproductive and inefficient.

To the extent that comprehensive reforms deprive parties of their common law water rights without compensation, the reforms also could significantly affect the holders of other property rights and uses of other resources. A government which appropriates private water rights without compensation may also take similar action with respect to other resources.¹¹⁵ Therefore, holders of other property rights may join present holders of water rights in resisting the reforms.

v. Ambler Realty Co., 272 U.S. 365 (1926). Under their police powers, states generally may adopt reasonable regulations in the interest of the public health, welfare, and safety without violating the constitutional rights of private property owners. Thus, states passing such regulations generally need not compensate affected property owners. See *Goldblatt v. Hempstead*, 369 U.S. 590 (1962) (upholding an ordinance prohibiting a prior beneficial use of certain property, concluding that the ordinance bore a reasonable relation to public safety). But when a regulation does not promote legitimate ends or unreasonably interferes with the use rights or investment-backed expectations of a property owner, the regulation may violate the due process clause. See *Nebbia v. New York*, 291 U.S. 502, 525 (1934).

112. Private landowners have used this argument successfully on numerous occasions to support takings claims. In *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393 (1922), for example, the Court invalidated a statute that prohibited mining activities causing houses, streets, and public buildings to subside when the statute was applied to prevent mining in places where the right to mine had been reserved. Before passage of the statute, the owner of land rich in coal deposits had deeded the surface rights to people who built homes on the land, but had reserved the right to remove the coal. Because the statute made the reserved mining rights virtually worthless and imposed the costs of achieving a public benefit primarily on the private landowner, the Court concluded that the statute had taken the landowner's property without compensation. *Id.* at 414-16.

113. See U.S. CONST. amends. V and XIV, § 1; *Chicago, Burlington & Quincy R.R. v. Chicago*, 166 U.S. 226 (1897) (incorporating the just compensation clause of the fifth amendment into the fourteenth amendment). For a discussion of takings law in the context of water reform, see MODEL WATER CODE, *supra* note 13, at 162-70. See also WATER POLICIES, *supra* note 5, at 281-83. For a discussion of takings law more generally, see Michelman, *Property, Utility, and Fairness: Comments on the Ethical Foundations of 'Just Compensation' Law*, 80 HARV. L. REV. 1165 (1967).

114. See R. POSNER, *supra* note 46, § 3.1, at 28-31.

115. A system which allowed a government to appropriate private property rights without compensation would not be efficient. Without assurances that the system would protect their rights, property owners would be reluctant to invest in activities requiring high capital outlays. Although the activities may be productive in the long run, the property owners could not know with certainty

Many of the reforms proposed to date recognize these problems and create special permit standards for existing users. The Model Water Code, for instance, eases the permit standard for existing users by waiving some of the normal requirements. Under the Code, a party conducting a use before the Code's effective date can obtain a permit without further proceedings "if the existing use is a reasonable-beneficial use" and if the use is "allowable under the common law" of the appropriate state.¹¹⁶ When the existing user fails to meet this modified standard, the Code terminates the user's rights, but the user is entitled to receive "reasonable compensation."¹¹⁷ Nevertheless, the Code does not fully protect expectancy interests. As the drafters admit, their approach does not "alleviate the loss of a riparian who has purchased his property at a price reflecting the potential value of undeveloped water, but who has not yet exercised these rights."¹¹⁸ Other reforms adopt a similar approach, protecting only the interests of existing users and ignoring the expectancy interests of prior water rights holders.¹¹⁹

These fairness concerns suggest that comprehensive reforms must better protect the rights of present holders. To minimize the holders' concerns, the reforms should either incorporate grandfather clauses for present water rights holders, pay present holders appropriate compensation, or give present holders permit interests that equal or exceed in value their lost water rights.¹²⁰ The last two options—paying compensation to permit holders and giving permits with enhanced value—would allow a more complete transition to the new allocation system. For this reason, they are preferable to the first option, if financially feasible.

In theory the common law provides better security for present holders of water rights because an agency cannot suddenly reallocate water use rights. Therefore, the common law would not seem to suffer from these various fairness concerns. In practice, however, the common law system often fails to provide sufficient user security. In riparian jurisdic-

whether the system would appropriate their rights before they received any return on their investment.

116. MODEL WATER CODE, *supra* note 13, § 2.03(2). Under this standard an existing user would not have to establish that the use "is consistent with the public interest and provisions of the State Water Plan," as the Code's permit standard normally requires. *Id.* § 2.02(1)(c). The drafters intended to give existing users an "advantage" by waiving the § 2.02(1)(c) requirement. *Id.* § 2.03(2) commentary at 183. In the drafters' view, the modified standard virtually "guarantee[s] existing users a twenty-year extension of their use." *Id.*

The drafters included the requirement that the existing use must be "allowable" under the common law of the appropriate state "to preclude all uses in violation of the riparian doctrine." *Id.* For a discussion of the types of uses "allowable" under the riparian doctrine, see Butler, *supra* note 7.

117. MODEL WATER CODE, *supra* note 13, § 2.03(4).

118. *Id.* commentary at 183-84.

119. See, e.g., FLA. STAT. ANN. § 373.226 (West 1974); MD. NAT. RES. CODE ANN. § 8-802(b) (1983); MISS. CODE ANN. § 51-3-5(2), (3) (Supp. 1986); Proposed Virginia Water Law, *supra* note 66, §§ 62.1-237 to -240. *But see* IND. CODE ANN. § 13-2-1-3 (Burns 1981) (protecting a riparian's right to use water for domestic purposes).

120. State legislatures frequently incorporate grandfather clauses to protect existing rights. See, e.g., MD. NAT. RES. CODE ANN. § 8-802(b) (1983).

tions common law water rights are vague in scope. Localities that need water sometimes take advantage of this vagueness by ignoring common law principles and diverting water despite the rights of present holders.¹²¹ Indeed, these uncertainties, when added to the sometimes compelling needs of water-poor jurisdictions, can generate more actual insecurity for present holders than even the current reform proposals.

3. *Water-Poor Jurisdictions*

Water allocation systems that closely tie use rights to the ownership of waterfront lands seriously limit the water supply options available to water-poor jurisdictions. Those jurisdictions in all likelihood feel frustrated by the problem, particularly if the state or region as a whole is water rich. Water-poor localities must either buy water, often on unfavorable terms, or develop their own water supply systems. Neither option is totally satisfactory. Agreements to sell and self-help plans both carry disadvantages for water-poor localities. In addition to being difficult to negotiate, agreements to sell often provide only temporary relief. The benefits of these agreements usually continue only until the agreement terminates or until the water-rich seller invokes a clause typically found in such agreements conditioning the sale of water on the needs of the seller.¹²² Self-help plans are expensive, excessively so for many water-poor localities. Furthermore, such plans are risky and prone to numerous procedural and judicial delays.¹²³ Some water-poor jurisdic-

121. See MODEL WATER CODE, *supra* note 13, commentary at 181. A Virginia locality's proposed diversion of Lake Gaston provides an excellent example of this type of approach. In testimony before the Virginia State Water Study Commission, the locality, the City of Virginia Beach, stated that it believed current Virginia law permitted interbasin transfer. VA. STATE WATER STUDY COMM'N, REPORT TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA, H. DOC. NO. 32, at 3 (1984). Because Virginia Beach intends to accomplish the transfer by using condemnation powers and acquiring riparian rights affected by the diversion, it may be able to avoid future claims of injury under the common law system. *Id.*; VA. WATER RESOURCES RESEARCH CENTER, 13 WATER NEWS, No. 11, at 8 (Nov. 1982). See also Amended Complaint for Declaratory Judgment at ¶¶ 19-20, *City of Virginia Beach v. Roanoke River Basin Ass'n*, No. 84-11-N (E.D. Va. filed Jan. 9, 1984) (transferred to North Carolina and dismissed Dec. 17, 1985, No. 85-1625-CIV 5). Other local political subdivisions have undertaken diversions, however, without using such measures. See, e.g., *Purcellville v. Potts*, 179 Va. 514, 19 S.E.2d 700 (1942); *Gordonsville v. Zinn*, 129 Va. 542, 106 S.E. 508 (1921). Indeed, Virginia law supports their conduct. If a party challenges the locality's diversion in court, case law demonstrates the courts' willingness to allow the locality to condemn the appropriate riparian rights before issuing an injunction. See *Potts*, 179 Va. at 522-25, 19 S.E.2d at 702-04.

122. In Virginia, for example, the City of Virginia Beach has purchased its water from Norfolk since 1923. The terms of the agreement only entitle Virginia Beach to surplus water. Thus, when significant increases in population and repeated droughts created a serious water shortage in the early 1980's, the City discovered that Norfolk could no longer meet its needs. Short-term agreements with well owners have temporarily alleviated the problem, but long-term certainty is needed and being sought. See W. WALKER & P. BRIDGEMAN, ANATOMY OF A WATER PROBLEM: VIRGINIA BEACH'S EXPERIENCE SUGGESTS TIME FOR A CHANGE 2-3 (Virginia Water Resources Research Center, Special Report No. 18, Aug. 1985); see also *infra* note 123.

123. The plans of one Virginia municipality, the City of Virginia Beach, to develop its own water supply demonstrate the delays which administrative procedures and court challenges may cause. Administrative procedures initially delayed the City's plans as it sought the approval of the Army Corps of Engineers pursuant to federal law. Since obtaining that approval, the City has spent

tions may simply extract water in contravention of the rights of riparian landowners, hoping that they can hide in the vagueness of the common law.¹²⁴ But the same uncertainty that gives water-poor localities grounds for pursuing self-help plans also enables parties dissatisfied or upset with their plans to challenge them, often with success.¹²⁵

Uncertainty of this type is troubling. A system that encourages de facto allocations due to its uncertainty and archaic rules has lost much of its value and effectiveness. Existing and potential users need and deserve greater clarity and integrity in their water allocation system. Moreover, a vague system cannot distribute water fairly and equitably, either for the water-poor or for the water-rich, when allocations are so imprecise and vulnerable. Desperate water-poor localities often must test the system to satisfy their needs, while water-rich parties find themselves constantly in court to protect their interests.

When water is abundant in one part of a state and deficient elsewhere, the state in fairness should allow at least some reallocation of water among regions. Water is too vital a resource to leave one area water-poor simply because of political boundaries. Recognizing this point, comprehensive reformists have developed water allocation systems that admittedly focus on need.¹²⁶ In responding to the needs of water-poor areas, however, reformists have tended to elevate those needs above others. In their zeal to achieve distributive justice, they have developed allocation systems that are poorly balanced. To be effective, a water allocation system must be fair and morally responsive to all parties. Such fairness, in turn, requires a better balance of all competing interests.

numerous hours responding to lawsuits challenging its plan. See *North Carolina v. Hudson*, No. 84-36-CIV 5 (E.D.N.C. filed Jan. 12, 1984); *City of Virginia Beach v. Champion Int'l Corp.*, No. 84-10-N (E.D. Va. filed Jan. 9, 1984); *City of Virginia Beach v. Roanoke River Basin Ass'n*, No. 84-11-N (E.D. Va. filed Jan. 9, 1984) (transferred to North Carolina and dismissed Dec. 17, 1985, No. 85-1625-CIV 5).

124. For a discussion of those principles and of their vague but generally restrictive approach to public consumptive rights, see Butler, *supra* note 7.

125. Establishing an unlawful diversion does not necessarily entitle a complaining party to relief. In most riparian jurisdictions, for example, the party also must establish that it suffered injury because of the diversion. See 2 H. FARNHAM, *supra* note 71, § 499. For a discussion of the remedies available to riparians, see RESTATEMENT (SECOND) OF TORTS § 850A comment m (1977).

126. Comprehensive reforms typically provide for the needs of water-poor areas by authorizing interbasin transfers. For example, the Model Water Code authorizes a party to apply for a permit when the use would involve the withdrawal and transfer of water beyond the watershed of the watercourse to another area. MODEL WATER CODE, *supra* note 13, § 2.02(2). The Kentucky permit statute has a similar provision. See KY. REV. STAT. ANN. §§ 151.140, .200(2) (Bobbs-Merrill 1980 & Supp. 1986). Although water-rich areas generally react negatively to provisions allowing redistribution of water resources, the failure of many reforms to provide adequately for water-rich areas seems to anger residents of those areas more. See, e.g., VA. WATER RESOURCES RESEARCH CENTER, 16 WATER NEWS, No. 11, at 2 (Nov. 1985) (one critic of reforms recently proposed in Virginia noted that the proposals "seem to be directed toward water-needy areas, with little concern being shown for water-rich areas or for compensation in the case of transfers").

IV. ENVIRONMENTAL CONSIDERATIONS AND THE NONCONSUMPTIVE NEEDS OF FUTURE GENERATIONS

Despite the increasingly clear link between environmental preservation and resource use, many allocation systems relegate environmental values to vague, secondary roles. An effective system needs a better perspective on environmental objectives. It also must better internalize environmental values in the allocation process.

A. Present Reforms and Environmental Values

Most comprehensive reforms identify environmental values as valid policy objectives of a water allocation system. For example, section 1.02(3) of the Model Water Code recognizes the importance of making "adequate provision" for "the protection and procreation of fish and wildlife, the maintenance of proper ecological balance and scenic beauty, and the preservation and enhancement of waters of the state for navigation, public recreation, municipal uses, and public water supply."¹²⁷ The Code declares such objectives to be "in the public interest"¹²⁸ and adopts the public interest standard as one of three criteria governing the issuance of permits.¹²⁹ As the commentary explains, this policy provision imposes "an affirmative duty upon the state . . . to see that . . . [the identified "public interest"] uses are not adversely affected by the operation of the code."¹³⁰ A similar provision appears in section 1.07, which defines the basic policy goals of a state water use plan. That section requires, among other things, that the state agency developing the plan give "careful consideration to the requirements of public recreation, the protection of the environment, and procreation of fish and wildlife."¹³¹

With a few exceptions,¹³² however, the provisions defining the environmental objectives of comprehensive water reforms represent, at best, well-meaning but vague policy statements. The provisions offer little concrete guidance on how to assess environmental objectives when allocating water. One of the few guidelines which the Model Water Code provides, for instance, appears in the commentary to section 1.02(3). This commentary explains merely that uses promoting environmental and ecological objectives recognized as "in the public interest" are to be "preferred to other beneficial uses when competing applications are made

127. MODEL WATER CODE, *supra* note 13, § 1.02(3). Other comprehensive reforms that contain similar provisions include FLA. STAT. ANN. §§ 373.016, .036 (West 1974 & Supp. 1986); Proposed Virginia Water Law, *supra* note 66, § 62.1-197(C).

128. MODEL WATER CODE, *supra* note 13, § 1.02(3).

129. *Id.* § 2.02(1).

130. *Id.* § 1.02(3) commentary at 85.

131. *Id.* § 1.07(7). For a list of topics which the state agency should address in developing the state water use plan, see *supra* note 66 and accompanying text.

132. One exception found in the Model Water Code is the provision requiring the establishment of minimum flow levels for various watercourses. See MODEL WATER CODE, *supra* note 13, § 1.07(4)-(5). Another more significant exception is the Code's regulation of water quality. See *id.* §§ 5.01-.16. For a discussion of the water quality exception and of its limitations, see *infra* note 149.

for a permit.”¹³³

Other portions of the Code are even less clear in defining how the state should emphasize environmental goals. The state water use plan provision is a prime example of the confusing—and conflicting—ways in which the Code emphasizes environmental concerns. One portion of the commentary explains that the plan “may call for the reservation of unused waters for the purpose of public recreation, protection of the environment, and procreation of fish and wildlife.”¹³⁴ The provision defining the objectives of a state water use plan, however, omits any reference to the goals of recreation, environmental protection, or fish and wildlife preservation. Instead, the drafters stress the “attainment of maximum reasonable-beneficial use,” “proper economic development,” “the attainment of adequate water quality,” and other generally worded goals.¹³⁵

133. MODEL WATER CODE, *supra* note 13, § 1.02(3) commentary at 85. The Proposed Virginia Water Law is another example of a reform that fails to provide substantive standards for the bill's environmental policies and for its directive to develop a state water use plan. In its statement of policy, for example, the bill declares that users should obtain “maximum beneficial use” of the state's waters, but then recognizes that the agency must adequately provide for various environmental concerns, like “procreation of fish and wildlife” and “maintenance of proper ecological balance.” Proposed Virginia Water Law, *supra* note 66, § 62.1-197(C). In identifying the “directives” of the state water use plan, however, the bill stresses economic use and fails to refer specifically to environmental goals. *See id.* § 62.1-213. Because the bill identifies “attainment of maximum reasonable-beneficial use of water” as an objective, *id.* § 62.1-213(a), and because a reasonable-beneficial use is, by definition, consistent with the public interest, environmental concerns may be objectives of a state water use plan by implication. The absence of a direct reference to environmental goals suggests, however, that such goals are less important than other identified goals. Moreover, in setting forth the conditions for issuance of a permit, the bill does not explicitly mention environmental concerns. *See id.* § 62.1-234. These omissions suggest that the legislature intended environmental concerns primarily to be part of the policy formulation process, not part of the planning and implementation stages, and that the governing body generally need not adopt measures or authorize uses that minimize adverse environmental impact. One exception to this observation is the requirement that the Board establish minimum levels for surface watercourses, lakes, ponds, and groundwater to protect water resources and “the ecology of the area.” *Id.* § 62.1-215. Even when the proposed law mentions environmental concerns, however, it usually does not give sufficient guidance as to the actual role of those concerns in the planning and decision-making process. Furthermore, the reform does not require the governing body to make any findings relating to environmental policies. *See, e.g., id.* § 62.1-217. For an example of a statute that defines environmental concerns with greater specificity, see MINN. STAT. ANN. §§ 115.01-.09 (West 1977 & Supp. 1986); *see also* National Environmental Policy Act, 42 U.S.C. §§ 4321-4370 (1982 & Supp. III 1985); Outer Continental Shelf Act, 43 U.S.C. §§ 1332-1356 (1982 & Supp. III 1985).

134. MODEL WATER CODE, *supra* note 13, § 1.07(7) commentary at 107. Another statement in the commentary also indicates that the objectives of a state water use plan include environmental goals. In the commentary to § 1.07(2), the drafters explicitly state that one objective of a state water use plan is “the attainment of a pattern of maximum reasonable-beneficial uses of water for such purposes as protection of the environment, procreation of fish and wildlife, recreational use, improvement of water quality, irrigation, mining, power development, and domestic, municipal, and industrial uses.” *Id.* § 1.07(2) commentary at 104. The provision defining the objectives of a state water use plan, however, does not mention specifically the environmental goals which the commentary to § 1.07(2) identifies. Instead that provision incorporates by reference environmental goals when it defines one objective as “the attainment of maximum reasonable-beneficial use of water for such purposes as those referred to in subsection (1) above.” *Id.* § 1.07(2)(a). Subsection 1, in turn, specifically identifies the environmental goals listed in the drafters' statement as topics which the state agency developing the state water use plan should study and address. *Id.* § 1.07(1); *see also supra* note 131 and accompanying text; *infra* note 135.

135. Section 1.07(2) of the Model Water Code lists the following objectives:

One of the few sections of the water use plan provision that specifically protects and promotes environmental values in the allocation process requires that the plan establish minimum flows for surface waters, lakes, ponds, and groundwater.¹³⁶ These levels should be sufficiently high, the Code states rather vaguely, to prevent uses "harmful to the water resources and ecology" of an area.¹³⁷

Even when the Code clearly defines environmental values, they appear to play a secondary role to use-oriented concerns. The Model Water Code extols environmental objectives, but it then declares that its provisions should be "liberally interpreted to obtain maximum beneficial use of the waters of the state for such purposes as domestic uses, irrigation, power development, mining, and industrial uses."¹³⁸ The Code introduces environmental objectives with the qualifying phrase: "However, adequate provision shall be made. . . ."¹³⁹ Environmental goals thus appear as exceptions to the overriding policy objective of the Code to promote "maximum beneficial use."¹⁴⁰ Other evidence of subor-

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- (a) the attainment of maximum reasonable-beneficial use of water for such purposes as those referred to in subsection (1) above;
 - (b) the proper economic development of the waters of the state;
 - (c) the control of the waters of the state for such public purposes as navigation, drainage, sanitation, and flood control;
 - (d) the attainment of adequate water quality as expressed in the state water quality plan; and
 - (e) the implementation of the water resources policies expressed in section 1.02 of this code.

MODEL WATER CODE, *supra* note 13, § 1.07(2). The reference to "such purposes as those referred to in subsection (1) above" appearing in § 1.07(2)(a) admittedly incorporates environmental values by reference into the first objective. Along with a wide range of economic purposes and uses, § 1.07(1) identifies various environmental purposes as topics which the state agency should study and address. *See id.* §§ 1.07(1), (2)(a); *supra* notes 131, 134. But other than the incorporation by reference and the directive to attain the "maximum reasonable-beneficial use" for the identified purposes, the Code is silent on how to promote the environmental purposes as part of the first objective. Given the absence of specific guidance and the comprehensiveness of the purposes identified in § 1.07(1), the attainment of environmental objectives may depend more on the personality and philosophies of the decisionmaker than on a precise legislative mandate.

The reference to the "water resources policies expressed in section 1.02" found in § 1.07(2)(e) exemplifies again the Code's vague approach to environmental goals. As explained earlier, *supra* notes 127-33 and accompanying text, although § 1.02 recognizes the importance of environmental values, that section provides little guidance on how to implement those values in the allocation process. *See* MODEL WATER CODE, *supra* note 13, § 1.02(3).

136. MODEL WATER CODE, *supra* note 13, § 1.07(4). At best, the Code indirectly requires attaining water quality goals in the permit process. Section 2.02(1)(c) requires that a permit be "consistent with . . . the provisions of the State Water Plan," which, in turn, promotes "the attainment of adequate water quality" consistent with § 5.04. *Id.* §§ 2.02(1)(c), 1.07.

137. *Id.* § 1.07(4)(a), (b). The commentary to this provision explains that "[i]t is essential that any system of water allocation include a minimum flow for public purposes." The commentary lists "commercial navigation, recreational boating, fishing, hunting, and swimming, and ecological protection" as appropriate public purposes for the minimum flow concept to protect. *Id.* § 1.07(4) commentary at 106.

138. *Id.* § 1.02(3).

139. *Id.* According to basic canons of statutory construction, this type of language is either a proviso or an exception. Both operate to restrict the effect of the preceding statutory language. *See* 2A C. SANDS, SUTHERLAND STATUTORY CONSTRUCTION §§ 47.08, 47.11 (4th ed. 1984 & Supp. 1986). For a discussion of the differences between exceptions and provisos, see 1A *id.* § 21.11 (4th ed. 1985).

140. MODEL WATER CODE, *supra* note 13, § 1.02(3). The term "exceptions" is used in a broad

dination also exists. Uses that promote certain environmental values are to be "preferred to other beneficial uses when competing applications are made."¹⁴¹ But implicit in this command is the suggestion that environmental concerns are relevant only if competing applications are made.¹⁴² Similarly, although the state plan "may call for the reservation of unused waters" for environmental purposes,¹⁴³ the reference to "unused waters" suggests that environmental objectives are subordinate to the promotion of actual beneficial use.¹⁴⁴

An effective water allocation system, one responsive to the diverse needs of present as well as future generations, must move beyond vague statements of public interest and require that environmental values become an active, integral part of management and allocation decisions. It must cease authorizing uses that have serious environmental and ecological consequences.¹⁴⁵ A water allocation system that fails to make envi-

sense here to signify any type of statutory language that restricts or qualifies the effect of preceding statutory provisions. Cf. *supra* note 139 (using the term "exception" in a more technical sense).

141. MODEL WATER CODE, *supra* note 13, § 1.02(3) commentary at 85.

142. A similar conclusion follows from the commentary accompanying § 1.07(7). It suggests that environmental objectives should control permit decisions when approval of a permit application would conflict with future water use needs. See *id.* § 1.07(7) commentary at 107.

143. *Id.*

144. The terms of § 1.07(7) are somewhat inconsistent with how the drafters explain the provision and with the interpretation set forth in the text. The provision states that the "state board shall give careful consideration to the requirements of public recreation, the protection of the environment, and procreation of fish and wildlife" and that the Board "may prohibit or restrict other future uses on certain designated streams which may be inconsistent with these objectives." *Id.* § 1.07(7). The drafters' use of the word "future" suggests, however, that the text's interpretation is correct at least for existing uses. Environmental objectives are subordinate to the promotion of present beneficial uses. Further, the drafters' comment about "unused waters" apparently attempts to explain the meaning of the phrase "future uses." See *supra* note 143 and accompanying text. If the comment in fact explains that phrase, then the text's interpretation may be correct for all uses, present and future.

Some comprehensive proposals pay even less heed to environmental values than does the Model Water Code. For example, the Proposed Virginia Water Law requires a permit to be issued to a qualified applicant. See Proposed Virginia Water Law, *supra* note 66, § 62.1-234; *supra* note 133.

145. To the extent that the common law allocation system prohibits interbasin transfers, that system minimizes some of the environmental concerns discussed in the text. Unfortunately, this benefit is unlikely to be long-term. As water-poor areas become more desperate for water, common law principles prohibiting interbasin transfers will likely become less of a deterrent to those areas; water-poor jurisdictions will be more inclined to take advantage of the flexibility and uncertainty of common law principles by proceeding with such transfers. See Butler, *supra* note 7 (discussing the uncertainty of common law principles applicable in many eastern states). Because jurisdictions would be facing serious water shortages when attempting interbasin transfers, environmental concerns, in all likelihood, would be secondary to the locality's quest for water. Admittedly, some government oversight would occur with interbasin transfer plans. The government's role in a recent Virginia plan, however, indicates that the oversight will not alter the plans significantly. See *supra* note 123.

Interbasin transfers exemplify why comprehensive reforms should consider environmental factors. Comprehensive reforms typically allow such transfers. See, e.g., FLA. STAT. ANN. § 373.223(2) (West Supp. 1986); IOWA CODE ANN. § 455B.265(1) (West Supp. 1986); KY. REV. STAT. ANN. §§ 151.140, .200(2) (Bobbs-Merrill 1980 & Supp. 1986); MODEL WATER CODE, *supra* note 13, § 2.02. Because such transfers involve the withdrawal and transport of a large volume of water, the party instituting the transfer may have to build impoundment structures to hold and store the diverted water. These structures would affect the environment substantially. Besides changing the ecology of the area where the construction occurs, the impoundment structures would require

ronmental objectives an integral part of the allocation process ignores the positive correlation between the goals of efficient, beneficial use and environmental preservation.¹⁴⁶ Uses that detrimentally affect the environment can seriously impair society's ability to use a resource in the future, both for consumptive and nonconsumptive purposes.¹⁴⁷ For example, the preservation of wetlands sustains fish and wildlife populations. Healthy fish and wildlife populations, in turn, benefit recreational and commercial users, who are less likely to criticize the relevant allocation system as unproductive or unfair when it maintains the resources that they use.¹⁴⁸ Thus, an allocation system that promotes preservation can be both efficient and equitable, saving resources for future users while yielding current benefits.¹⁴⁹

flooding the land in the destination area. This flooding would alter, if not destroy, wildlife habitats. Serious environmental concerns also would arise in the basin of origin. For example, substantial withdrawals could affect the chemical composition of waters remaining in the situs basin, as well as the types of wildlife that frequent the area.

For a discussion of the impacts of water diversion projects, see generally WATER POLICIES, *supra* note 5, at 19-37; Hagan & Roberts, *supra* note 104.

146. When an allocation system makes environmental preservation an integral part of the allocation process, the state may more easily meet the goal of achieving optimum use of the resource in question. For a discussion of this relationship in the context of coastal ecosystems, see *Managing for Optimum Carrying Capacity*, in J. CLARK, *supra* note 106, at 50-105.

147. Recent studies indicate that the ecological well-being of natural resources affects the plants and animals dependent on those resources for food and shelter. The Estuary Protection Act, 16 U.S.C. § 1222 (1982) (enacted Aug. 3, 1968), produced one such study. It directed the Secretary of the Interior to conduct a thorough study of the estuaries of the United States. The results of this extensive study fill seven volumes and are found in BUREAU OF SPORT FISHERIES AND WILDLIFE AND BUREAU OF COMMERCIAL FISHERIES, FISH AND WILDLIFE SERVICE, U.S. DEP'T OF INTERIOR, 1-7 NATIONAL ESTUARY STUDY (1970) [hereinafter cited as NATIONAL ESTUARY STUDY]. See also 1 CORPS OF ENGINEERS, U.S. DEP'T OF THE ARMY, CHESAPEAKE BAY: EXISTING CONDITIONS REPORT, app. C, pt. VI (1973); U.S. ENVIRONMENTAL PROTECTION AGENCY, CHESAPEAKE BAY: INTRODUCTION TO AN ECOSYSTEM 33 (Jan. 1982) [hereinafter cited as INTRODUCTION TO AN ECOSYSTEM].

The ecological well-being of natural resources also influences uses directly and indirectly related to the resources. For example, changes in the Chesapeake Bay, caused by rising population and increased use, have altered the types of fisheries in the area. Freshwater spawners and oysters have decreased significantly, while marine spawners have increased. U.S. ENVIRONMENTAL PROTECTION AGENCY, CHESAPEAKE BAY PROGRAM: FINDINGS AND RECOMMENDATIONS 19-21 (Sept. 1983). Even uses conducted miles away from the Bay appear to have had an impact on environmental quality. For example, farming practices in New York have affected nutrient levels. See Butler, *supra* note 64, at 788.

148. Of course, improving the quality and quantity of fish cannot produce a more equitable and efficient allocation system if that system permits monopolies and does not give all interested parties a reasonable opportunity to receive an allotment.

149. In fairness to the drafters of the Model Water Code, their comprehensive system for reform does address an important environmental concern, the problem of water quality. Chapter 5 of the Code provides for the development of a water quality plan to govern the state's waters. See MODEL WATER CODE, *supra* note 13, § 5.04. The overall state water use plan, in turn, defines as one of its objectives "the attainment of adequate water quality as expressed in the state water quality plan." *Id.* § 1.07(2)(d). The Code thus makes the environmental concern of water quality an important element of a state's water use plan.

Although the Code addresses the issue of water quality with some specificity, the Code tends to focus upon how to maintain a certain water quality while conducting a use. For example, the Code directs that water quality standards should reflect the "past, present, and potential uses of the waters for transportation, domestic and industrial consumption, bathing, fishing and fish culture, fire prevention, sewage disposal, industrial and other wastes, and other possible uses." *Id.* § 5.05(3)(c).

A water allocation system that discounts environmental values through vague terminology and through use-oriented provisions appears to be little more than an attempt to placate environmentalists. Even if the environmental objectives were adopted with the best of intentions, such a system still seems to assume that nonconsumptive uses are not that important. It places too little value on society's interest in preserving and protecting natural communities, and it takes for granted the continued existence and abundance of ecosystems and resources.

The environmental insensitivity of most comprehensive water reforms is not surprising. In the absence of an environmental crisis, people have difficulty realizing the importance of environmental values in their daily lives.¹⁵⁰ Further, even lawmakers who recognize the basic importance of environmental concerns can undervalue these concerns because they are difficult to define in precise, quantitative terms. Often the environmental consequences of an action remain unknown for years.

Legislatures are even more prone to undervalue environmental concerns raised by water reforms than the relevant equitable considerations. Although both types of concerns are difficult to quantify, equitable considerations tend to be easier to identify because of their direct relationship with emotions and beliefs. In addition, equitable concerns typically focus on issues of use, not on the preservation of water resources for nonconsumptive purposes. Environmental concerns, by contrast, often inhibit rather than facilitate resource use. Apparently because of these differences, decisionmakers clearly seem to favor economic and equitable values over broadly phrased environmental goals.

Other relevant considerations include factors which affect the "economic, residential, agricultural, industrial, or recreational" uses of surrounding land. *Id.* § 5.05(3)(b). The Code thus appears to require that the state maintain water quality primarily to promote and protect beneficial uses.

Although the Code's provisions and commentary suggest that the drafters may have understood the relationship between the environment and society's uses, whether state legislatures drafting reform legislation based on the Model Water Code perceive the relationship is far from clear. Besides tending to adopt use-oriented provisions, *see, e.g.*, IND. CODE ANN. §§ 13-2-1-1 to -3 (Burns 1981); MINN. STAT. ANN. § 105.41 (West 1977 & Supp. 1986), state legislatures usually provide little, if any, commentary explaining why they adopted particular provisions or made certain policy choices. For example, the Proposed Virginia Water Law contains no commentary. Although the legislative report recommending the law's adoption provides some explanation, the report is sketchy and brief. The report only explains in general terms the types of water problems facing Virginia in the 1980's, prior State Water Study Commission studies, and the reports which the Commission used to formulate the water law. In addition, the legislative report only briefly describes the advantages and disadvantages of three alternative proposals. *See* VA. STATE WATER STUDY COMM'N, REPORT TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA, S. DOC. NO. 15 (1981); *see also* VA. WATER STUDY COMM'N, REPORT TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA, S. DOC. NO. 14 (1980).

150. In its report *Water Policies for the Future*, the National Water Commission acknowledges this problem. The Commission observes that the absence of a long-term water crisis is at least partially responsible for the reluctance of many states in the traditionally water-rich East to adopt comprehensive reforms. WATER POLICIES, *supra* note 5, at 280. For an example of such a crisis-oriented attitude, *see* VA. STATE WATER STUDY COMM'N, REPORT TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA, S. DOC. NO. 24, at 8 (1982) (statement by Louis L. Guy, Jr., P.E., warning that the "end [of] the drought . . . may turn out to be a curse instead of a blessing if it allows us to stick our heads back in the sand").

Environmental values also suffer because of the admitted difficulty that often exists in assessing environmental risks.¹⁵¹ For example, although groundwater pollution clearly presents long-term risks, the severity of the problem today is uncertain.¹⁵² Some scientists claim that current estimates of nationwide groundwater contamination "mean very little, for in some areas reported contamination incidents are very few, whereas in . . . more populated areas . . . they are often much more frequent."¹⁵³ Other scientists contend that the problem of groundwater pollution is more serious and widespread.¹⁵⁴ This difference in opinion stems in part from the difficulties inherent in evaluating underground water supplies and in collecting and assessing pollution information.¹⁵⁵

151. Other environmental problems also demonstrate this difficulty. In the West, for example, the Colorado River defies society's elaborate technological and regulatory efforts to control it. Although engineers have constructed nine large dams on the river and have learned to manipulate and control its surface flow, the river has thwarted extensive planning efforts by going underground. On the surface, efforts to control the river's flow and minimize flooding appear successful. Below the surface, however, the river has begun to seep underground into aquifers, raising the water table in some areas so high that small lakes are surfacing. The problem is especially serious in the farmbelt of Yuma, Arizona, where the high water table has saturated the soil with salt, causing crops to rot. See Russakoff, "Tamed" Colorado Defies the River Oracles, *Washington Post*, Feb. 26, 1984, at A1, col. 4.

Farther east, flood-control measures on the Mississippi River also are having unanticipated environmental consequences. Through a system of levees, engineers have prevented the Mississippi from overflowing its banks. In preventing flooding, however, engineers also have forced the river to deposit its silt in the mouth of the river. As a consequence, the mouth has been extended almost to the edge of the continental shelf, while the levees have deprived millions of acres of wetlands along the river of the fertile sediment. Without the rich silt to replenish them, wetlands eventually lose their protective vegetation and disappear. At present, the wetlands are vanishing at a rate of about 50 square miles per year. The only effective way to halt the loss of wetlands may be to allow the river to run free. Begley & Burger, *Setting the Mississippi Free*, *NEWSWEEK*, Sept. 20, 1982, at 100-01.

152. Two scientists who studied the problem conclude that groundwater pollution "has occurred throughout the United States and is likely to continue to some extent in the future." Pye & Patrick, *Ground Water Contamination in the United States*, 221 *SCIENCE* 713, 718 (1983). In their view, however, past estimates of nationwide groundwater contamination are not "complete" or "realistic." *Id.* at 717, 718. The Environmental Protection Agency and others have estimated that about one percent of the country's groundwater has been contaminated. See *id.* at 717; *The State of the Nation's Ground Water: Hearing Before the Subcomm. of the House Comm. on Government Operation*, 98th Cong., 2d Sess. 403, 408 (1984) (written statement of Jay H. Lehr, Exec. Dir., Nat'l Water Well Assoc.). Pye and Patrick have criticized these estimates because "they took into account only certain point sources and disregarded nonpoint sources." Pye & Patrick, *supra*, at 717. In addition, Pye and Patrick stress that the ability to generalize on a nationwide basis is lacking because the number of reported contaminations varies too greatly around the country. *Id.*

153. Pye & Patrick, *supra* note 152, at 717.

154. Scientist Ruth Patrick chaired a committee to examine the health of the nation's groundwater in reaction to alarmists' estimates. See Wolman, *When the Well is Dry*, in *PROCEEDINGS OF THE NATIONAL WATER CONFERENCE* 8 (J. Wilson ed. 1982). Some of the more conservative conclusions about the health of the nation's groundwater are based on the report of that committee. See *supra* notes 152-53 and accompanying text. See generally *PROCEEDINGS OF THE NATIONAL WATER CONFERENCE* (J. Wilson ed. 1982) (presenting different views on the health of the nation's waters).

155. Pye and Patrick explain that groundwater contamination is difficult to assess, not only for the reasons mentioned earlier, see *supra* note 152, but also because of the very character of groundwater. Groundwater by definition is underground, where both the existence and the source of groundwater pollution are difficult to detect. See Pye & Patrick, *supra* note 152, at 718. See generally *id.* at 714-17 (discussing factors that should be considered in assessing groundwater contamination).

Similar scientific uncertainty afflicts the study of groundwater withdrawal. When aquifer use exceeds the rate of natural recharge, the chemical composition of water in the aquifer and in nearby watercourses can change significantly. Excessive withdrawals can reduce the storage capacity of an aquifer and change the pressure within the underground system.¹⁵⁶ Yet, despite this understanding of the general implications of groundwater withdrawal, scientists still lack sufficient technical data to assess fully the long- and short-term effects of heavy withdrawals.¹⁵⁷ Without this knowledge, they generally cannot predict, with precision, how additional withdrawals will affect existing users and cannot supply the data needed for effective long-range planning.

B. *Internalizing Environmental Values*

Regardless of the difficulties involved, water allocation systems must give greater consideration to environmental values in the allocation process. The Model Water Code provides a starting point for seriously promoting environmental values. The Code adopts the common law concept of a public trust and uses that concept to define the basic relationship of all parties, private and public, to water resources.¹⁵⁸ At the beginning of its key policy provision, section 1.02, the Code "[r]ecogniz[es] that the waters of the state are the property of the state and are held in public trust for the benefit of its citizens."¹⁵⁹ Based on this principle, the Code then declares that the people of a state "as beneficiaries of this trust have a right to have the waters protected for their use."¹⁶⁰

The Code drafters used the public trust concept because it "provide[d] a means for the revitalization of water law through recognition that state authorities and private citizens have a duty to other citizens to protect the *res* of the trust."¹⁶¹ According to the drafters, the trust concept allows courts and agencies to consider "correlative rights and duties in the handling and consumption of water, not simply as they affect local riparian owners, but rather as these rights and duties affect the total citizenry of the state as the beneficiaries of the trust."¹⁶² The drafters view the public trust doctrine as an especially effective tool for regulating in-

156. Excessive withdrawals from surface waters can affect underground supplies similarly. See generally WATER POLICIES, *supra* note 5, at 230-47.

157. For example, scientists do not know the rate at which saltwater moves and the effect that changes in withdrawal rate may have upon the intrusion of saltwater. C. COX, VIRGINIA'S MOST IMPORTANT WATER-RELATED PROBLEMS 5 (Virginia Water Resources Research Center, Special Report No. 13, Aug. 1981). See generally Pye & Patrick, *supra* note 152, at 714-15 (discussing the difficulty of studying groundwater).

158. See MODEL WATER CODE, *supra* note 13, § 1.02(1). Only a few other comprehensive reforms use public trust language. See N.J. STAT. ANN. § 58:1A-2 (West 1982); Proposed Virginia Water Law, *supra* note 66, § 62.1-197(A).

159. MODEL WATER CODE, *supra* note 13, § 1.02(1).

160. *Id.*

161. *Id.* § 1.02(1) commentary at 82 (footnote omitted).

162. *Id.* at 82.

terests in water resources because water is a "transient natural resource"¹⁶³ that "no one citizen can permanently own . . . or totally deny other citizens."¹⁶⁴ Because of the physical characteristics of water, rights in water resources "do not fall within the classic definition of property rights" and require a special conceptual tool to aid in regulation.¹⁶⁵

The drafters' reasoning suggests that they used the doctrine primarily for two reasons. First, the drafters recognized the difficulty of addressing water resources through more traditional property doctrine. Second, the drafters apparently wanted to recognize the interests of all citizens in water resources. Their discussion of the "pragmatic effects" of using the doctrine further supports this observation. Much of that discussion focuses on the special duty which a state bears under the doctrine to protect water and on the interests that each citizen has in the state's water resources.¹⁶⁶ For the first time, the drafters also linked the trust doctrine with environmental concerns. They asserted that the doctrine would give each citizen "standing to demand judicial review of the actions or omissions of private individuals or state agents which affect the quality of water."¹⁶⁷ In addition, the drafters identified, as "perhaps [the] most significant" effect of the doctrine, the possibility that the "public trust could effectively serve as a viable procedure to effectuate antipollution standards."¹⁶⁸ Both statements suggest that the drafters envisioned using the public trust doctrine for environmental purposes.

Although the public trust doctrine was not developed to promote environmental values, it can serve that purpose well. As the United States Supreme Court explained the doctrine, each state holds in trust for the benefit of its people certain lands and waters within its boundaries, principally navigable waters and the underlying lands.¹⁶⁹ The doctrine originally arose to protect the people's interest in navigation and fishing.¹⁷⁰ Courts could easily extend the doctrine, however, to protect more intangible interests, such as environmental concerns, that have an impact upon navigation or fishing. As noted above, environmental preservation and resource use are inextricably linked. Further, in at least one other area of the law—the federal commerce power—the judiciary has relied upon the link between environmental protection and resource use to justify regulating a resource for environmental purposes.¹⁷¹

163. *Id.* at 83.

164. *Id.* at 83-84.

165. *Id.* at 84.

166. *See id.*

167. *Id.*

168. *Id.*

169. *See Illinois Central R.R. v. Illinois*, 146 U.S. 387, 435-37, 452-53 (1892).

170. *See Martin v. Waddell*, 41 U.S. (16 Pet.) 367, 410 (1842). For a discussion of the development of the public trust doctrine in America, see Selvin, *The Public Trust Doctrine in American Law and Economic Policy, 1789-1920*, 1980 WIS. L. REV. 1403, 1408-40.

171. *See, e.g., United States v. Ashland Oil & Transp. Co.*, 504 F.2d 1317 (6th Cir. 1974) (Congress could, under its commerce powers, prohibit the discharge of pollutants into nonnavigable

Courts thus should have little difficulty extending the public trust doctrine to protect environmental concerns. They also should have little difficulty extending it beyond surface waters to include other types of water resources. Although nonnavigable surface waters and underground waters are not within the traditional scope of the doctrine, scientists now view all waters as part of one hydrologic cycle. Thus, the use of one type of water resource affects other types.¹⁷² Furthermore, at least in spirit, the doctrine represents an attempt to protect the public interest in valuable natural resources which individuals cannot easily appropriate or possess, except in a limited and transitory sense. The doctrine reflects the normative judgment that certain natural resources, like water resources, are too valuable to society to allow ownership by a few citizens. Implicit in this judgment is the view that all citizens should have the opportunity to use and enjoy those natural resources.¹⁷³

In recent years some courts and commentators have agreed, at least implicitly, with the above analysis, applying the public trust doctrine to a wide range of resources and interests.¹⁷⁴ A few courts have even applied the doctrine to water allocation systems, usually to force decisionmakers to consider environmental concerns. These courts, however, have proceeded only on a preliminary level. They have considered whether the trust doctrine requires a decisionmaker to weigh the policies of the doctrine—especially the doctrine's environmental implications—in allocating water resources.¹⁷⁵ Although courts have answered that question

tributaries of navigable streams because water pollution poses a direct threat to navigation and thus to commerce).

172. See generally O. MATTHEWS, *WATER RESOURCES, GEOGRAPHY AND LAW* 1-9 (1984); Foley, *Water and the Laws of Nature*, 5 U. KAN. L. REV. 492, 496-98 (1957).

173. See Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 473, 484-85 (1970). For further discussion of the Roman and English law origins of the doctrine, see Deveney, *Title, Jus Publicum, and the Public Trust: An Historical Analysis*, 1 SEA GRANT L.J. 13 (1976).

174. See, e.g., *Marks v. Whitney*, 6 Cal. 3d 251, 259, 491 P.2d 374, 380, 98 Cal. Rptr. 790, 796 (1971) (public rights include fishing, hunting, bathing, swimming, boating, use for general recreational purposes, and preservation of tidelands in their natural state); *Borough of Neptune City v. Borough of Avon-by-the-Sea*, 61 N.J. 296, 309, 294 A.2d 47, 54-55 (1972) (public rights include access to the beach and recreational uses such as bathing, swimming, and other shore activities); Sax, *supra* note 173, at 473-74, 556-57 (advocating a broad use of the public trust doctrine for such problems as air pollution, pesticides, utilities, and strip mining).

175. For example, the North Dakota Supreme Court held, in *United Plainsmen Ass'n v. North Dakota State Water Conservation Comm'n*, 247 N.W.2d 457 (N.D. 1976), that the public trust doctrine limited the authority of state officials to issue permits for water use without determining "the potential effect of the allocation of water on the present water supply and future water needs" of the state. *Id.* at 462. Although the court refused to enjoin the state from issuing future water permits for energy production until the state prepared a comprehensive plan, the court did observe that the public trust doctrine "requires, as a minimum, evidence of some planning by appropriate state agencies and officers in the allocation of public water resources." *Id.* at 463.

Referring to the *United Plainsmen* decision, the California Supreme Court agreed that decisionmakers must consider the public trust doctrine in planning and allocating water resources. *National Audubon Soc'y v. Superior Court*, 33 Cal. 3d 419, 446, 658 P.2d 709, 728, 189 Cal. Rptr. 346, 364, *cert. denied*, 464 U.S. 977 (1983). The court found that the public trust doctrine, as codified in the California Code, prohibits the acquisition of any rights that might be harmful to the state's water resources. Thus, the state owed a "duty as trustee to consider the effect of . . . [appropriation of

affirmatively, they have gone no further; specifically, they have failed to provide detailed guidance on how the trust doctrine protects environmental values in water allocation decisions.

Properly applied, the trust concept could have far-reaching implications for environmental policies in the water management area. Through the doctrine courts could require state water agencies to consider ecological values, even though state statutes define those values only in general or vague terms. If the doctrine is already well developed in a state, the administering agency and reviewing courts would have a set of established principles and precedents with which to work.

In states where the doctrine is not already broadly interpreted or well received, however, a general reference to the public trust doctrine in reform legislation may do little more than create confusion. Even in many progressive states, courts are only beginning to explore the relationship between the trust doctrine and environmental matters involved in water allocation decisions. If the status of the doctrine is uncertain, a general policy statement recognizing the public trust in water resources probably would not succeed in promoting environmental objectives. A judiciary already reluctant to apply the trust concept in traditional situations probably would not extend the doctrine to foster broad environmental goals without more specific guidance. Furthermore, even an administrator inclined to employ the doctrine might find the task very difficult without greater guidance from the state's legislature or judiciary.

In states that need outside help, the federal laws regulating navigable waters may provide some guidance. Pursuant to the commerce clause, the federal government for years has regulated activities affecting the navigability and environmental quality of the nation's waters.¹⁷⁶ Because most significant water use projects affect navigation and the envi-

water] on the public trust" and "to preserve, so far as consistent with the public interest, the uses protected by the trust." *Id.* at 446-47, 658 P.2d at 728, 189 Cal. Rptr. at 365. Although the court did not specifically define the nature and extent of this process, it stressed certain factors throughout its opinion. These factors included the effect of a proposed use on the physical and chemical characteristics of the relevant area, the effect of a proposed use on wildfowl, fisheries, and other natural communities, the use's impact on the health of nearby residents, and the use's impact on commercial and noncommercial activities. *See id.* at 428-31, 434-36, 447-48, 658 P.2d at 714-16, 719-20, 729, 189 Cal. Rptr. at 351-53, 356-57, 365-66.

Both these cases demonstrate that the public trust doctrine imposes certain responsibilities on a government in making allocation decisions about its water resources. These decisions also indicate that when the allocation system does not effectively balance public and private interests parties may invoke the doctrine to protect the public interest. However, neither decision defines the planning responsibilities which the doctrine imposes on a government. Nor do the decisions define the type of public interest which the doctrine can protect.

176. *See* U.S. CONST. art. I, § 8 (commerce clause); *Gibbons v. Ogden*, 22 U.S. (9 Wheat.) 1 (1824) (applicability of the commerce clause to navigable waters); *United States v. Ashland Oil & Transp. Co.*, 504 F.2d 1317 (6th Cir. 1974) (applicability of the commerce clause to pollution of nonnavigable tributaries of navigable waters). Key federal statutes regulating the navigability and environmental quality of the nation's waters include the Rivers and Harbors Act, 33 U.S.C. §§ 401-467e (1982 & Supp. III 1985), the Clean Water Act, 33 U.S.C. §§ 1251-1376 (1982 & Supp. III 1985), and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4370 (1982 & Supp. III 1985). Although other bodies have regulatory jurisdiction, the Army Corps of Engineers has pri-

ronment, federal laws often apply. Little benefit would accrue, of course, if a state merely duplicated the federal procedures, but the federal experience may provide a useful analogy for developing state policies and programs.

Even with guidance and support from the federal regulatory procedures, states must still specify clearly their environmental objectives and must define with precision the role and priority of those objectives in the allocation process. Federal review focuses only on the environmental impact of a proposed activity and not on the relationship of environmental concerns to a state's water allocation system. States therefore need to provide specific guidance on how to implement environmental objectives in allocating water resources. Such guidance could include provisions that identify specific environmental concerns, define the nature and extent of those concerns, and specify as much as possible the importance of each concern. In addition, the legislature could recommend or require various measures to minimize or resolve environmental problems. The legislature also could set forth the type of process and procedures that courts and agencies should use in considering and evaluating environmental issues.

V. CONCLUSION

As the demand on America's water resources continues to rise, the pressure for comprehensive reform will increase. Although reformists have already developed comprehensive proposals to replace the common law principles, many states have not enacted the measures. This article has attributed the states' inaction to the almost single-minded focus of the proposals on efficiency and their consequent failure to incorporate the notion of a water ethic. Because of the importance and growing scarcity of America's water resources, efficiency should continue to play an important role in water allocation systems. Nevertheless, an effective and responsible resource allocation system must focus more intensively on the interests of future generations and on the needs of natural communities. By actively promoting many of the equitable and environmental

mary responsibility for projects affecting the navigability of the nation's waters. The Secretary of the Army has the duty

to prescribe such regulations for the use, administration, and navigation of the navigable waters of the United States as in his judgment the public necessity may require for the protection of life and property, or of operations of the United States in channel improvement, covering all matters not specifically delegated by law to some other executive department.

33 U.S.C. § 1 (1982). In helping the Secretary to carry out this mandate, the Corps oversees various activities that obstruct, impair, or affect navigable waters. See 33 U.S.C. §§ 401-467e, 1344 (1982 & Supp. III 1985). For a discussion of the federal government's jurisdiction and control of navigable waters, see 2 R. CLARK, *supra* note 47, §§ 100-101; 3 *id.* §§ 200-208 (2d ed. 1984 & Supp. 1985). See also Note, *The Clean Water Act of 1977: Midcourse Corrections in the Section 404 Program*, 57 NEB. L. REV. 1092 (1978) (discussing the Corps' expanding jurisdiction over navigable waters). Because any substantial withdrawal of water would come from navigable waters, federal regulations generally would apply to plans for construction of a withdrawal system.

values identified in this article, reformists can develop a more balanced water allocation system.