

Florida State University Journal of Land Use and Environmental Law

Volume 19
Number 1 *Fall 2003*

Article 5

April 2018

Balancing Public Water Supply and Adverse Environmental Impacts under Florida Water Law: From Water Wars towards Adaptive Management

Kevin E. Regan

Follow this and additional works at: <https://ir.law.fsu.edu/jluel>



Part of the [Environmental Law Commons](#), and the [Water Law Commons](#)

Recommended Citation

Regan, Kevin E. (2018) "Balancing Public Water Supply and Adverse Environmental Impacts under Florida Water Law: From Water Wars towards Adaptive Management," *Florida State University Journal of Land Use and Environmental Law*. Vol. 19 : No. 1 , Article 5.

Available at: <https://ir.law.fsu.edu/jluel/vol19/iss1/5>

This Article is brought to you for free and open access by Scholarship Repository. It has been accepted for inclusion in Florida State University Journal of Land Use and Environmental Law by an authorized editor of Scholarship Repository. For more information, please contact efarrell@law.fsu.edu.

Balancing Public Water Supply and Adverse Environmental Impacts under Florida Water Law: From Water Wars towards Adaptive Management

Cover Page Footnote

Kevin E. Regan is a third year law student at the University of Florida Levin College of Law, where is he pursuing a J.D. and an Environmental and Land Use Law Certificate. He graduated summa cum laude with highest honors in biology from the University of Tennessee at Chattanooga in 2000.

BALANCING PUBLIC WATER SUPPLY AND ADVERSE ENVIRONMENTAL IMPACTS UNDER FLORIDA WATER LAW: FROM WATER WARS TOWARDS ADAPTIVE MANAGEMENT

KEVIN E. REGAN*

Table of Contents

I. INTRODUCTION	124
II. BACKGROUND ON FLORIDA WATER LAW	127
A. <i>Eastern, Western, and Administrative Approaches to Water Law</i>	127
B. <i>Florida's Administrative Water Law System: Chapter 373</i>	132
C. <i>Consumptive Use of Water: Chapter 373, Part II</i>	133
D. <i>SMFWMD Rules and the Basis of Review</i>	136
III. TAMPA BAY WATER WARS: WEST COAST REGIONAL WATER SUPPLY AUTHORITY V. SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT	137
A. <i>Background on Hydrology, the Tampa Bay Area, and Its Water Issues</i>	138
B. <i>Litigation Erupts: West Coast Regional Water Supply v. SMFWMD</i>	144
C. <i>The Administrative Law Judge's Recommended Order</i>	145
D. <i>Potential Legal Response: Exploring the Draft Final Order</i>	150
E. <i>Resolution of the Four-Wellfields Dispute: The Formation of Tampa Bay Water</i>	160
IV. IMPLICATIONS OF WATER LAW REGARDING ADVERSE ENVIRONMENTAL IMPACTS FOR PROTECTING ECOSYSTEMS	161
A. <i>The Full Meaning of the Reasonable Beneficial Use Standard</i>	162
B. <i>Balancing Human and Ecosystem Needs</i>	163
C. <i>Certainty, Flexibility, and Fairness</i>	170
D. <i>The Need to Incorporate Adaptive Management into Water Law and Policy</i>	177
V. CONCLUSION	183

I. INTRODUCTION

According to some scholars, "Florida's water management system has been the envy of many other states for over 25 years."¹ The Florida Water Resources Act of 1972,² which was based on the Model Water Code,³ establishes an administrative system to comprehensively manage water. The drafters of the Model Water Code attempted to combine the best aspects of eastern and western water law into a legal system that balances the water needs of humans and ecosystems.⁴ However, increasing scarcity of water has intensified conflicts and made achieving this delicate balance even more difficult. This article explores one of the largest battles of the Tampa Bay region's "water war[s]."⁵ This battle, known as the four-wellfields case, culminated in major administrative litigation to determine whether permits for municipal wellfields should be renewed despite evidence that pumping was causing severe adverse environmental impacts.⁶ Although the Southwest Florida Water Management District (SWFWMD) never issued a final order, its staff prepared a draft final order that provides insight into the issue.⁷ Analysis of this dispute demonstrates the importance of

* Kevin E. Regan is a third year law student at the University of Florida Levin College of Law, where he is pursuing a J.D. and an Environmental and Land Use Law Certificate. He graduated *summa cum laude* with highest honors in biology from the University of Tennessee at Chattanooga in 2000.

1. Richard Hamann, *Law and Policy in Managing Water Resources*, FLORIDA WATER RESOURCES ATLAS 302, 307 (1998) [hereinafter *Law and Policy in Managing Water Resources*]. See also Erik Swenson, *Comment: Public Trust Doctrine and Groundwater Rights*, 53 U. MIAMI L. REV. 363, 378 (1999) (stating that Florida has one of the most comprehensive permit systems in the country).

2. See FLA. STAT. § 373.012 et. seq. (2002).

3. FRANK E. MALONEY, RICHARD C. AUSNESS, AND J. SCOTT MORRIS, A MODEL WATER CODE WITH COMMENTARY (University of Florida Water Resources Research Center 1972) [hereinafter MODEL WATER CODE]. The 1972 legislature discovered this work by Dean Frank E. Maloney and his colleagues at the University of Florida. This code became the basis for the Florida Water Resources Act of 1972. *Law and Policy in Managing Water Resource Laws*, *supra* note 1, at 306.

4. Irene K. Quincey, *History of the Regulation of Consumptive Use*, in FLORIDA ENVIRONMENTAL AND LAND USE LAW 14.1-1 to 14.1-2 (The Florida Bar 2001).

5. See, e.g., Martin A. Rowland, *The Evolution of Two Water Resource Management Systems: Case Studies of Tampa Bay and the Middle East*, 11 COLO. J. INT'L ENVTL. L. & POL'Y 411, 423 (2000).

6. W. Coast Reg'l Water Supply Auth. v. Southwest Fla. Water Mgmt. Dist., DOAH 95-1520, Recommended Order, May 29, 1997 [hereinafter Recommended Order]. This dispute is also referred to as the "four-wellfields case." See Honey Rand, In the Public Interest: A Story of Conflict, Communication, and Change in Tampa Bay's Water Wars 150 (2000) (unpublished PhD Dissertation, University of South Florida) (on file with author) [hereinafter In the Public Interest].

7. W. Coast Reg'l Water Supply Auth. v. Southwest Fla. Water Mgmt. Dist., Draft Final Order, Jan. 15, 1998 [hereinafter Draft Final Order] (on file with the author). The author obtained the Draft Final Order, which is now public record under Florida law, from the

considering both human and ecosystem water needs under the Florida Water Resources Act. It also illustrates the tension between the Act's goals of certainty, flexibility, and fairness, and indicates the need for an adaptive management approach to water policy.

Due to problems with saltwater intrusion, the Tampa Bay area's urban coastal communities historically pumped water from rural inland areas.⁸ These inland areas contain a variety of water resources that attract residents and support a variety of species.⁹ In the early 1990s, scientific data confirmed local residents' observations that pumping groundwater for municipal water supply was damaging overlying lakes and wetlands.¹⁰ Disputes over the validity of this data resulted in intense litigation¹¹ between West Coast Regional Water Supply Authority, the coalition of municipal governments that provided public water supply, and SWFWMD, the agency with comprehensive authority to manage water in the region.¹²

An Administrative Law Judge recommended¹³ that SWFWMD renew water use permits for the wellfields, despite his findings that pumping had caused serious environmental harm to surrounding

Southwest Florida Water Management District. See further discussion at note 201, *infra*. The author wishes to thank SWFWMD staff including John Parker, Water Use Regulation Manager, Pamela Gifford, Legal Assistant, and Mark Lapp, Assistant General Counsel, for their assistance in locating and obtaining the Draft Final Order. The views expressed in this article do not reflect those of SWFWMD. Any personal communications between the author and SWFWMD staff do not reflect the official position of SWFWMD or its Governing Board.

8. See Rowland, *supra* note 5, at 418.

9. See In the Public Interest, *supra* note 6, at 116-19.

10. See *id.* at 147-49.

11. Honey Rand, who served as Communications Director for SWFWMD during the four-wellfields dispute, explains that "by March of 1994, every local government and even some of the activists retained counsel and prepared for war. There were in-house lawyers, outside counsel, general counsel and experts on all sides — all paid for with public dollars." See *id.* at 150. She notes that an average resident of St. Petersburg was paying "for at least six lawyers on all sides of the case." *Id.*

12. See generally Recommended Order, *supra* note 6.

13. Florida's Administrative Procedure Act governs administrative hearings in the state. See generally FLA. STAT. § 120.50 et. seq. (2002). A centralized state agency, the Division of Administrative Hearings, provides an Administrative Law Judge (ALJ) who presides over the hearing. See *id.* at § 120.57(1) (procedures applicable to hearings involving disputed issues of material fact). After the hearing, parties can submit proposed recommended orders to the ALJ. *Id.* The ALJ submits to the agency and all parties a recommended order consisting of findings of fact, conclusions of law, and a recommended disposition. *Id.* at § 120.57(1)(k). Parties can file exceptions to recommended orders. *Id.* at § 120.57(1)(b). However, the agency may adopt the recommended order as the final order of the agency or it may reject or modify conclusions of law over which it has substantive jurisdiction and interpretations of administrative rules over which it has substantive jurisdiction. *Id.* at § 120.57(1)(l). The agency may not modify findings of fact unless the agency first determines from a review of the entire record that the findings of fact were not based upon competent substantial evidence. *Id.*

water resources.¹⁴ He ruled that adverse environmental impacts are not a valid basis for denying permits if the impacts existed when the permit was issued or previously renewed.¹⁵ Legal aspects of this decision are contrary to fundamental principles of Florida water law — that both human and ecosystem needs should be considered and that water allocation decisions should be periodically reevaluated. Because SWFWMD settled the case through participation in the formation of Tampa Bay Water,¹⁶ it did not issue a final order, which could have clarified these legal issues. However, SWFWMD staff did prepare a draft final order (hereinafter Draft Final Order), which addresses many of SWFWMD's concerns. Analysis of the legal arguments in the Draft Final Order provides a very different interpretation of the regulation of adverse environmental impacts under Chapter 373, Florida Statutes.

Part II of this article provides an overview of Florida water law, focusing on the regulation of consumptive use under the Florida Water Resources Act.¹⁷ Part III provides an overview of the water conflicts in the Tampa Bay area that resulted in litigation, discusses the Administrative Law Judge's decision, and explores legal arguments and potential solutions proposed by SWFWMD staff in response to this decision. It also briefly discusses the resolution of the dispute through the formation of Tampa Bay Water. Part IV discusses the importance of this area of Florida law for managing adverse environmental impacts and the need to achieve a delicate balance between human and ecosystem needs and certainty and flexibility under the Florida Water Resources Act. It also explores the implications of the Water Model Code, other recent legal developments, and the importance of an adaptive management approach to water policy.

14. See generally Recommended Order, *supra* note 6.

15. *Id.* at Conclusions of Law Nos. 294-301.

16. West Coast Regional Water Supply Authority was reorganized in 1999 to create Tampa Bay Water, which resulted in major structural and permitting changes in the Tampa Bay area. See discussion at Part III. E, *infra*.

17. Part II of the Florida Water Resources Act addresses consumptive use permitting. See FLA. STAT. §§ 373.203-250 (2002).

II. BACKGROUND ON FLORIDA WATER LAW

A. *Eastern, Western, and Administrative Approaches to Water Law*

Traditionally, there have been major differences between eastern and western states' laws governing the consumptive use of water. This section compares the eastern and western common law systems of water allocation and discusses some of the major advantages and disadvantages associated with each of these systems. It then discusses the general features of administrative systems of water allocation, which have been implemented in several states, including Florida.

1. *Eastern Approach to Water Law*

The east follows a riparian system of water allocation that evolved from the English common law governing surface watercourses.¹⁸ Under this system, the right to water is based upon ownership of property that is adjacent to a watercourse.¹⁹ Traditionally, under the natural flow doctrine, a property owner "was entitled to receive the flow of water across the land in an unaltered manner without decrease of quantity or quality."²⁰ This natural flow concept was later replaced by the reasonable use doctrine, which gives all riparian landowners the right to make reasonable use of the water and prohibits unreasonable interference with others' use.²¹ The determination of reasonableness typically requires a "balancing of social, economic, and environmental interests."²²

18. Frank E. Maloney et. al., *Florida's "Reasonable Beneficial" Water Use Standard: Have East and West Met?*, 31 U. FLA. L. REV. 253, 254 (1979) [hereinafter *Florida's Reasonable Beneficial Water Use Standard*].

19. *See id.* at 255.

20. Quincey, *supra* note 4, at 14.1.

21. *Id.* *See also Law and Policy in Managing Water Resources*, *supra* note 1, at 303.

22. *Law and Policy in Managing Water Resources*, *supra* note 1, at 303. During the boom of industrialization, the development of water supplies was often viewed as "reasonable." *Id.* Over time, judges developed a more comprehensive analysis that incorporated social concerns. *See id.* The Restatement Second of Torts has identified nine factors considered by the courts in determining reasonableness, which are as follows:

- 1) the purpose of the respective users;
- 2) the suitability of the uses to the water course or lake;
- 3) the economic value of the uses;
- 4) the social value of the uses;
- 5) the extent and amount of the harm caused;
- 6) the practicality of avoiding the harm caused;
- 7) the practicality of adjusting the quantity of the water used by each proprietor;
- 8) the protection of existing values of land, investments and enterprises;

The reasonable use rule, which is still used in most eastern states, was previously the rule in Florida.²³ For the most part, under the riparian system, all riparian owners' rights to the use of water from a particular source were equal²⁴ with the only restraint on this use being the prohibition of "unreasonable interference with the use of other riparian owners."²⁵ Disputes over the use of a particular source were resolved in court on a case-by-case basis.²⁶ Typically, the reasonable use rule also applied to the use of groundwater.²⁷

Many scholars have criticized the common law riparian system because it restricts the use of water to riparian owners and requires that water be used only on riparian land.²⁸ These individuals argue that riparian, or non-riparian owners, may make better use of water at other places.²⁹ Perhaps the greatest criticism of the riparian "system concerns the element of uncertainty associated with the reasonable use of water."³⁰ Due to the fact that the reasonableness of each use is determined relative to the rights of other riparian landowners, changes in water entitlements can occur when others begin or enlarge uses.³¹ However, the flexibility of the eastern riparian system can also be considered one of its greatest strengths.

and

9) the burden of requiring the users causing the harm to bear the loss.

(emphasis omitted) *Florida's Reasonable Beneficial Water Use Standard*, *supra* note 18, at 256. See also discussion Part IV. A, *infra*.

23. Quincey, *supra* note 4, at 14.1. This common law system has been replaced by an administrative system, discussed *infra*.

24. *Id.*

25. *Id.* at 14.1 to 14.2. See also *Taylor v. Tampa Coal*, 46 So. 2d 392, 392 (Fla. 1950) (holding that a landowner was enjoined from using water for irrigation of citrus that lowered the water level of a lake used for recreation).

26. Quincey, *supra* note 4, at 14.1 to 14.2. See also MODEL WATER CODE, *supra* note 3, at v.

27. Quincey, *supra* note 4, at 14.1 to 14.2. Although certain recreational values of a riparian owner may have been protected, the environmental values of a waterbody were generally not protected. *Id.* See also *Koch v. Wick*, 87 So. 2d 47 (Fla. 1956) (holding that "an overlying property owner could make use of the water percolating through the property provided that the use would not interfere with the use by other neighboring property owners"). Quincey, *supra* note 4, at 14.1 to 14.2. However, in most American jurisdictions, either the absolute ownership doctrine or the American rule determined consumptive rights to percolating groundwater. Richard C. Ausness, *The Influence of the Model Water Code on Water Resources Management Policy in Florida*, 3 J. LAND USE & ENVTL. L. 1, 9 (1987). These doctrines were essentially rules of capture that gave little protection to existing water users. *Id.*

28. MODEL WATER CODE, *supra* note 3, at 156.

29. *Id.*

30. *Id.* at v.

31. *Id.* See also *id.* at 156 n. 2.

New uses are more easily developed and changes to water allocation can be made to adjust for unforeseen circumstances.³²

Other major criticisms of the riparian system are its lack of administrative controls and the fact that in many jurisdictions a riparian landowner's right to reasonable use can only be determined by litigation.³³ Established water use patterns may be disrupted by later competing uses, thus some industries may refuse to locate in the area.³⁴ Furthermore, most courts are not as capable of ensuring uniformity as a centralized agency "due to their lack of expertise and the inefficiency of a case-by-case approach."³⁵ Another disadvantage of the common law riparian system is that it does not adequately address groundwater and its hydrological relationship with surface water.³⁶

An important characteristic of the eastern riparian system is that it generally provides a fair amount of protection for water resources and ecosystems.³⁷ At least in theory, individuals who use water for in-stream purposes such as fishing, swimming, boating, habitat, or aesthetics are as entitled to use the water as those who pump it for irrigation or industrial use.³⁸ In addition, the transport of water outside of a basin is generally discouraged,³⁹ which can help maintain ecological integrity.

2. *Western Approach to Water Law*

The water law system that developed in western states, known as the prior appropriation system, is very different than the riparian system. The prior appropriation system originated from gold miners' needs for large quantities of water for their mining operations.⁴⁰ "This water was first appropriated, sometimes at gunpoint," and eventually western law came to recognize these

32. See *Law and Policy in Managing Water Resources*, *supra* note 1, at 304.

33. MODEL WATER CODE, *supra* note 3, at 156.

34. *Id.* at 156-57. This concern was illustrated in the case of the Tampa Bay area. "In 1997, the Florida legislature pledged \$30 million to any computer chip manufacturer that would locate a new plant in the state." Rowland, *supra* note 5, at 440. "Representatives of I.G. Semicon visited the Tampa Bay area to consider siting a plant." *Id.* "The plant would require from 3 to 10 [million gallons per day] mgd of water, which is more than West Coast had in reserve." *Id.* "A site selection manager for the firm pointed out that no computer chip company would waste time considering a site where water availability is uncertain, as it was in the Tampa region in 1997." *Id.* "This missed economic opportunity provided an additional political push to resolve the region's water problems." *Id.*

35. MODEL WATER CODE, *supra* note 3, at 157.

36. *Id.* at vi.

37. See *Law and Policy in Managing Water Resources*, *supra* note 1, at 304.

38. *Id.*

39. See *id.*

40. MODEL WATER CODE, *supra* note 3, at vi.

appropriations.⁴¹ Under the beneficial use doctrine, an individual's right to appropriate water is limited to the quantity that is actually diverted and used for beneficial purposes.⁴² This doctrine was designed "to limit speculators from acquiring rights by diverting and wasting water."⁴³ The riparian system reflects a "first in time, first in right" approach, typically with perpetual and marketable water rights.⁴⁴ Because it is necessary to divert water to obtain the rights to its use,⁴⁵ "in-stream uses and the environment [can] only use water that was being transported in a watercourse to downstream users."⁴⁶

One of the most important advantages of the prior "appropriation system is that users of water are more certain of their rights" than those under the riparian system.⁴⁷ The prior appropriation system establishes priorities for use of water in times of shortage.⁴⁸ Individuals who "first appropriated water by diverting it had superior rights to junior appropriators."⁴⁹ During water shortages, "senior appropriators were entitled to their full allocation, while junior appropriators could be cut off completely."⁵⁰ Some individuals argue that the prior appropriation "system leads to the most beneficial use of water by . . . encouraging the sound development, wise use, conservation, and protection of water."⁵¹ However, others have noted "that in many cases, the effect of prior appropriation may be to waste water that otherwise could be put to beneficial use."⁵² Once an appropriator has begun using a certain amount of water, he or she will often continue to draw that amount, even if it is more than necessary, in order to maintain entitlement to that amount.⁵³

Additionally, there are significant environmental implications associated with the prior appropriations system. Fish, wildlife, recreation, and aesthetic uses of water are suffering in many

41. *Id.*

42. *Law and Policy in Managing Water Resources*, *supra* note 1, at 303.

43. *Id.*

44. *See id.*

45. This notion stands in direct contrast to the riparian system's emphasis on use inside the basin from which the water originates.

46. *Law and Policy in Managing Water Resources*, *supra* note 1, at 303.

47. MODEL WATER CODE, *supra* note 3, at vi.; *see also Law and Policy in Managing Water Resources*, *supra* note 1.

48. MODEL WATER CODE, *supra* note 3, at vi.

49. *Law and Policy in Managing Water Resources*, *supra* note 1, at 303.

50. *Id.*

51. MODEL WATER CODE, *supra* note 3, at vi.

52. *Id.* For example, in order to satisfy a senior appropriator of a stream, junior upstream appropriators may have to let several times the amount of the appropriation pass by them due to factors such as evaporation and seepage. *Id.*

53. *Id.* at vii.

western states because in-stream users were not traditionally allowed to appropriate water.⁵⁴ In order to preserve or restore aquatic ecosystems, it may be necessary to purchase expensive water rights from the private sector.⁵⁵

3. *Administrative Approach to Water Law*

As a result of the limitations of the common law approaches, many eastern and western states have developed administrative systems for managing water resources.⁵⁶ By controlling water use and creating limited rights in the use of water through permitting, these administrative systems can offset many of the disadvantages of eastern and western systems.⁵⁷ Permit systems, in theory, have three primary advantages over common law systems.⁵⁸ First, an agency can make a decision before a dispute has escalated to litigation, whereas a court acts only after litigation has begun.⁵⁹ Second, an agency can consider all water users and the public interest, while a court is often limited to the parties before it.⁶⁰ Third, judges and jurors lack expertise in the subject area, unlike an agency board that can make decisions with "long-range plans for the wise use and conservation of water resources in mind."⁶¹ It has been noted that the ideal permit system would "strike a measure of balance" between the reasonable use and prior appropriation doctrines.⁶² Such a system would attempt to allow permit holders some certainty through their permits, yet assure some "degree of flexibility by making the permits subject to periodic expiration and review."⁶³ In addition, an effective administrative system must "monitor resource use, research operation of the hydrologic system, reserve water for environmental, recreational,

54. *Law and Policy in Managing Water Resources*, *supra* note 1, at 303-04.

55. *See id.* at 308.

56. *See id.* at 304.

57. *Id.*

58. MODEL WATER CODE, *supra* note 3, at 78-79.

59. *Id.* However, it is notable that such determinations often lead to litigation, as discussion of the four-wellfields dispute demonstrates.

60. *Id.* Determining what exactly the "public interest" encompasses is problematic as is discussed *infra*. Individuals with different interests often have different conceptions of the "public interest." *See In the Public Interest*, *supra* note 6, at 13. Honey Rand notes that "all parties [involved in the four-wellfields dispute] believed they represented the 'true' public interest." *Id.*

61. MODEL WATER CODE, *supra* note 3, at 78-79. However, as the four-wellfields dispute demonstrates, the expertise of such agencies is often called into question by those who disagree with their decisions.

62. MODEL WATER CODE, *supra* note 3, at 79.

63. *Id.* The drafters of the Model Water Code cited the compromise approach advocated by the Commissioners on Uniform State Laws in the Model Water Use Act, which was adopted by Iowa law. *Id.* *See also* IOWA CODE ANN. § 455A.20 (Supp. 1971).

and other instream uses, develop new water supplies, and promote water conservation."⁶⁴ As discussed below, Florida's water management system attempts to balance aspects of eastern and western water law as well as balance human and ecosystem water needs.

B. Florida's Administrative Water Law System: Chapter 373

The Water Resources Act of 1972 provides the legal framework for water management in Florida.⁶⁵ Despite numerous amendments, the basic structure and provisions of the Act, which were modeled after the Model Water Code, are still intact.⁶⁶ The Act delegates comprehensive authority to manage water to five regional water management districts and to the Florida Department of Environmental Protection (DEP).⁶⁷ Water management districts' boundaries follow surface hydrologic basin boundaries, as opposed to relying on political subdivisions such as counties or cities.⁶⁸ This allows the districts to have responsibility for entire watersheds, which enhances the ability of a district to address ecosystem-level problems.⁶⁹

A governing board that consists of unpaid citizens, appointed by the governor and confirmed by the senate, heads each of the water management districts.⁷⁰ This governing board is responsible for hiring an executive director and approving the district's budget, plans, acquisitions, rules, and orders.⁷¹ Although the DEP supervises and reviews the districts,⁷² "much of the regulatory authority has actually been delegated to the districts."⁷³

64. See *Law and Policy in Managing Water Resources*, *supra* note 1, at 304.

65. *Id.* at 306.

66. See *id.* The drafters of the Model Water Code attempted to provide a model for the development of a comprehensive regulatory program in eastern states. MODEL WATER CODE, *supra* note 3, at vii. This model code had three primary goals: 1) to take into account the hydrologic interrelationship of all types of water resources in the state; 2) to provide greater certainty than is possible under a court-administered reasonable use approach; and 3) to retain sufficient flexibility to make possible realistic long-range plans for the conservation and wise use of water resources and the elimination of waste. *Id.*

67. *Law and Policy in Managing Water Resources*, *supra* note 1, at 306. See also FLA. STAT. § 373.026 (2002) (establishing general powers and duties of the Department of Environmental Protection); FLA. STAT. § 373.069 (2002) (creating water management districts).

68. See *Law and Policy in Managing Water Resources*, *supra* note 1, at 306.

69. *Id.* For example, the watershed of the Everglades is entirely in the South Florida Water Management District. *Id.*

70. *Id.* See also FLA. STAT. § 373.073 and § 373.079.

71. See *Law and Policy in Managing Water Resources*, *supra* note 1, at 306; FLA. STAT. § 373.079 (4)(a).

72. See FLA. STAT. § 373.026(7).

73. *Law and Policy in Managing Water Resources*, *supra* note 1, at 306. "[M]any district decisions are subject to review by the governor and cabinet." *Id.*

Water management districts have broad and comprehensive authority, and consumptive use permitting is one of their most important responsibilities.⁷⁴ The districts can regulate nearly “any use of water that involves withdrawing or diverting it from its source.”⁷⁵ Furthermore, this authority is exclusive to the water management districts; “local governments are prohibited from regulating consumptive use.”⁷⁶

“All water management districts have adopted rules relating to the regulation of the consumptive use of water” that establish the conditions for issuance of a permit.⁷⁷ The conditions are similar, but not identical, among the different water management districts.⁷⁸ Furthermore, each of the districts has adopted specific criteria known as a “Basis of Review” that establish the technical requirements necessary for allocation decisions.⁷⁹ In discussing specific requirements for consumptive water use permitting, this article will focus on those of SWFWMD.⁸⁰

C. Consumptive Use of Water: Chapter 373, Part II

Under the Florida Water Resources Act (Act), there is a three-pronged test to determine whether a proposed consumptive use of water should be allowed. To obtain a water use permit under Section 373.223(1), Florida Statutes, an applicant must establish that the proposed use of water: 1) will not interfere with any presently existing legal use of water, 2) is a reasonable beneficial use as defined in Section 373.019, Florida Statutes, and 3) is

74. *Id.*

75. *Id.* See also Ausness, *supra* note 27, at 16; FLA. STAT. § 373.023(1). Water is broadly defined as “any and 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, as well as all coastal waters within the jurisdiction of the state.” FLA. STAT. § 373.019(17). This broad definition recognizes all major parts of the hydrologic cycle.

76. *Law and Policy in Managing Water Resources*, *supra* note 1, at 306. See also FLA. STAT. § 373.217(2)-(3).

77. Quincey, *supra* note 4, at 14.1 to 14.7. See FLA. STAT. § 373.219 (requiring permits generally) and § 373.113 (granting rulemaking authority to the governing board).

78. Quincey, *supra* note 4, at 14.1 to 14.7.

79. *Id.* The use of more specific criteria for implementing the reasonable beneficial use and public interest criteria was upheld despite the necessity of using professional judgment to interpret and apply them. *Southwest Fla. Water Mgmt. Dist. v. Charlotte County*, 774 So. 2d 903, 911 (Fla. 2d DCA 2001). See discussion at Part IV. B (3), *infra*.

80. “The [Southwest Florida Water Management] District’s primary funding source is *ad valorem* taxes, though revenues also come from state and federal appropriations, permit fees, interest earnings, and other sources.” Rowland, *supra* note 5, at 428. “Although the [Southwest Florida Water Management] District contains all or part of sixteen counties in west-central coast of Florida, the Tampa Bay metropolitan area represents its largest concentration of residents.” *Id.*

consistent with the public interest. These three criteria, particularly the reasonable beneficial use and public interest standards, provide legal mechanisms for balancing human and ecosystem needs for water.

The first prong, which prohibits harm to other uses, appears to have its origins the riparian system.⁸¹ In terms of its function, one author explains that "[i]f harm to an existing user is not detected until after a new use has been permitted, the permit may . . . be modified to abate the adverse impacts."⁸² While in theory this prong could be used to protect in-stream uses, such as recreational, aesthetic, or environmental uses, in practice it has only been used to protect the withdrawals of other users.⁸³

"The reasonable beneficial use standard is described as the 'most innovative part of the criteria.'"⁸⁴ This term is carefully crafted and should not be confused with the traditional standards of either the riparian or prior appropriation systems because it includes aspects of each.⁸⁵ "Reasonable beneficial use is defined as 'the use of water in such quantity as is necessary for economic and efficient utilization for a purpose and in a manner which is both reasonable and consistent with the public interest.'"⁸⁶ "This standard was designed to synthesize the positive attributes of common law riparian and prior appropriation systems as well as avoid some of their shortcomings."⁸⁷ In addition, it has been argued that this term embodies legal precedent from both riparian and prior appropriation systems.⁸⁸

In order to emphasize the importance of public interest considerations, the Act requires consistency with the public interest as the third criterion.⁸⁹ As discussed *infra*, the reasonable beneficial use and public interest standards are quite similar. What exactly the "public interest" encompasses is not easy to define, and whether

81. Ronald A. Christaldi, *Sharing the CUP: A Proposal for the Allocation of Florida's Water Resources*, 23 FLA. ST. U. L. REV. 1063, 1080-81 (1996).

82. *Id.* at 1081.

83. See *W. Coast Reg'l Water Supply Auth. v. Southwest Fla. Water Mgmt. Dist.*, 1989 Fla. Env. LEXIS 81, *1, *29-31 (Aug. 30, 1989) (Final Order) (finding that a farmer's dependence on the water table to maintain soil moisture for non-irrigated crops and the surface waters for watering cattle was not an existing use entitled to protection under the Florida Water Resources Act).

84. *Law and Policy in Managing Water Resources*, *supra* note 1, at 306.

85. Quincey, *supra* note 4, at 14.1 to 14.3.

86. Christaldi, *supra* note 81, at 1080.

87. *Id.*

88. See discussion *infra* at Part IV.A.

89. See Richard Hamann & Thomas T. Ankersen, *Water, Wetlands, and Wildlife: The Coming Crisis in Consumptive Use*, 67 FLA. BUS. J. 41, 42 (1993).

a use is consistent with the public interest is determined on a case-by-case basis.⁹⁰

Under Florida's administrative system, districts grant consumptive use permits for fixed periods of time, generally with a maximum duration of twenty years.⁹¹ However, the districts do not typically grant such long-term permits because they must reevaluate the availability of water and more efficient use techniques.⁹² Permits are freely transferable and typically accompany the land or the facilities where the water is being used.⁹³ Before a permit expires, the user must apply for a renewal, and districts may require new conditions to protect the environment or require more efficient use of water supplies.⁹⁴ Because permits can be revoked under very limited circumstances, permittees are practically guaranteed a right to use water for the duration of their permit, subject only to possible water use restrictions imposed due to drought or emergency conditions.⁹⁵

Environmental considerations are an important part of the decision whether to issue or reissue a consumptive use permit.⁹⁶ For example, a wellfield permit that would adversely impact wetlands could, in theory, be denied for failure to meet the reasonable beneficial use or public interest standards.⁹⁷ A pair of authors has noted that the public interest criterion offers the broadest authority for implementing the statutory policy of protecting natural resources, fish, and wildlife.⁹⁸ Further discussion of the four-wellfields dispute illustrates the importance of fully considering and

90. Christaldi, *supra* note 81, at 1081. See also *Friends of Fort George v. Fairfield Communities*, 24 Fla. Supp. 2d 192, DOAH Case Nos. 85-3537, 85-3596, Final Order dated Dec. 9, 1986 (factors considered in finding whether a use is in the public interest include: water conservation and reuse, total amount of water allocated, lack of saltwater intrusion, lack of impact to potentiometric surface, reduction of estuarine pollution, and development of new water sources.)

91. *Law and Policy in Managing Water Resources*, *supra* note 1, at 306. See also FLA. STAT. § 373.236. However, the districts may authorize a permit of duration up to fifty years in the case of a municipality or other governmental body or a public works where such a period is required to provide for the retirement of bonds for the construction of waterworks and waste disposal facilities. *Id.* at § 373.236(2).

92. See *Law and Policy in Managing Water Resources*, *supra* note 1, at 306.

93. *Id.*

94. *Id.* See also FLA. STAT. § 373.239 (2002) (renewal of permits).

95. *Law and Policy in Managing Water Resources*, *supra* note 1, at 306. See FLA. STAT. § 373.243 (governing revocation of permits); FLA. STAT. § 373.246 (declaration of water shortage or emergency). Circumstances in which permits may be revoked include giving false statements in applications, reporting, or communications with the district. *Id.* at § 373.243(1).

96. *Law and Policy in Managing Water Resources*, *supra* note 1, at 306.

97. *Id.* However, as discussed in Part III (C), *infra*, the administrative law judge in the four-wellfields case recommended that permits be renewed despite these concerns.

98. Hamann & Ankersen, *supra* note 89, at 42.

addressing the environmental implications of consumptive use decisions.

D. SWFWMD Rules and the Basis of Review

In order to implement the provisions of Part II, Chapter 373, Florida Statutes, each of the water management districts has adopted rules that interpret the three major conditions for issuance.⁹⁹ To assist SWFWMD with permit decisions, Rule 40D-2.301, Florida Administrative Code, lists fourteen conditions that an applicant must meet in order to receive a water use permit.¹⁰⁰ An applicant must provide "reasonable assurances" that these conditions will be met on both an "individual and cumulative basis."¹⁰¹

SWFWMD's Basis of Review establishes specific criteria for, and further explanation of, the review of permit applications. The Basis of Review is incorporated by reference into Chapter 40D-2 of the Code, by way of Rule 40D-2.091 of the Code. Under SWFWMD's Basis of Review, uses that require permits include: withdrawals that are "greater than or equal to 100,000 gallons per day" on an average annual basis; wells that have "an outside diameter of 6 inches or more; and surface water withdrawals from a pipe with an

99. See Quincey, *supra* note 4, at 14.1 to 14.6 & 14.1 to 14.7.

100. FLA. ADMIN. CODE r. 40D-2.301(2003) states:

(1) In order to obtain a Water Use Permit, an Applicant must demonstrate that the water use is reasonable and beneficial, is in the public interest, and will not interfere with any existing legal use of water, by providing reasonable assurances, on both an individual and a cumulative basis, that the water use:

- (a) Is necessary to fulfill a certain reasonable demand;
- (b) Will not cause quantity or quality changes which adversely impact the water resources, including both surface and ground waters;
- (c) Will not cause adverse environmental impacts to wetlands, lakes, streams, estuaries, fish and wildlife or other natural resources;
- (d) Will comply with the provisions of 4.3 of the Basis of Review described in Rule 40D-2.091 F.A.C.;
- (e) Will utilize the lowest water quality the Applicant has the ability to use;
- (f) Will not significantly induce saline water intrusion;
- (g) Will not cause pollution of the aquifer;
- (h) Will not adversely impact offsite land uses existing at the time of the application;
- (i) Will not adversely impact an existing legal withdrawal;
- (j) Will incorporate water conservation measures;
- (k) Will incorporate reuse measures to the greatest extent practicable;
- (l) Will not cause water to go to waste; and
- (m) Will not otherwise be harmful to the water resources within the District.

101. *Id.*

outside diameter of four inches or greater.”¹⁰² “Some uses, notably domestic consumption, are exempt from permit requirements.”¹⁰³ “Proposed uses that do not meet WUP’s criteria are either denied permits or modified to comply with [Southwest Florida Water Management] District permitting criteria.”¹⁰⁴ Permits typically contain standard conditions, which include water quality monitoring, minimum aquifer levels, and they may require the mitigation of adverse environmental impacts.¹⁰⁵

III. TAMPA BAY WATER WARS: WEST COAST REGIONAL WATER SUPPLY AUTHORITY V. SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

The on-going disputes over water in the Tampa Bay area, commonly referred to as the “water wars,” exemplify the increasing conflict over water use in the state of Florida.¹⁰⁶ They also illustrate the close relationship between groundwater withdrawals and surface natural systems, and the need to balance the water demands of humans and ecosystems. Part III first provides background on the hydrology of the Tampa Bay area and its long-standing water issues. Second, it discusses the major dispute that attempted to determine whether permits allowing withdrawals from four municipal wellfields should be renewed, despite strong evidence that the withdrawals caused severe damage to the area’s lakes and wetlands. Third, it explores potential legal responses that SWFWMD staff proposed in its Draft Final Order. Fourth, it briefly discusses the resolution of the dispute through the formation of Tampa Bay Water.

102. SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT, WATER USE PERMIT INFORMATION MANUAL, BASIS OF REVIEW at 2-2 (March 2003) [hereinafter BASIS OF REVIEW]. Citations to the “BASIS OF REVIEW” denote this current version, references to older versions of the Basis of Review in Part III (D), *infra*, should be clear from context.

103. See FLA. STAT. § 373.219(1) (2002) (permits required); FLA. STAT. § 373.019(4) (2002) (defining “domestic use” as “the use of water for the individual personal household purposes of drinking, bathing, cooking, or sanitation”).

104. Rowland, *supra* note 5, at 428.

105. BASIS OF REVIEW, *supra* note 102, at B6-1-B6-3.

106. Some authors suggest that Florida’s challenge is not a problem regarding the allocation of a finite depleting supply, but rather a geographic and temporal mismatch of supply and demand. See, e.g., Christalidi, *supra* note 81, at 1065.

A. *Background on Hydrology, the Tampa Bay Area, and Its Water Issues*

1. *Hydrology and the Tampa Bay Area*

In the hydrologic cycle, rain falls to earth, flows over land as diffused surface water, and then enters a surface watercourse or percolates into the soil.¹⁰⁷ In terms of surface watercourses, water is eventually returned to the atmosphere through evaporation or transpiration.¹⁰⁸ Until relatively recently, very little was known about the processes that occur with groundwater once it percolates through the soil.¹⁰⁹

As the field of hydrogeology has developed, the understanding of groundwater and its connection to surface water has improved. Groundwater is the sub-surface water contained in the interconnected voids in geologic formations.¹¹⁰ Although it makes up less than one percent of the world's water supply, groundwater provides drinking water for approximately one half of the population of the United States.¹¹¹ Water that seeps into the soil is pulled downward by gravity until it reaches a depth where the sub-surface is saturated with water.¹¹² Water in the uppermost soils also provides the sustenance for lakes and wetlands.¹¹³ The top of this saturated zone is referred to as the water table, and below this water table is the aquifer.¹¹⁴

There are essentially two types of aquifers: unconfined and confined. As the four-wellfields dispute illustrates, this distinction can have important implications for the relationship between groundwater and surface water systems. A confined aquifer is overlain by a confining layer, a geologic formation such as rock or clay that is incapable of transmitting significant quantities of

107. Ausness, *supra* note 27, at 3.

108. *Id.*

109. As a result of this limited understanding, common law regarding groundwater is rather undeveloped. One court explained: "The secret, changeable and unknowable character of underground water in its operations is so diverse and uncertain that we cannot well subject it to the regulations of the law, nor build upon it a system of rules, as is done in the case of surface streams." *Law and Policy in Managing Water Resources*, *supra* note 1, at 303 (quoting *Chatfield v. Wilson*, 28 Vt. 49, 54 (Vt. 1856)). For a discussion of scientific and technological certainty, see also *infra* Part IV(C) (1).

110. Swenson, *supra* note 1, at 372 (citing C.W. FETTER, *APPLIED HYDROGEOLOGY* 5, 570 (2d. ed. 1988)). Chapter 373, Florida Statutes, defines "groundwater" as "water beneath the surface of the ground, whether or not flowing through known and definite channels." FLA. STAT. § 373.019(7) (2002).

111. See Swenson, *supra* note 1, at 372.

112. *Id.*

113. Rowland, *supra* note 5, at 417.

114. Swenson, *supra* note 1, at 372 n.78.

water.¹¹⁵ In contrast, an unconfined aquifer is not covered by any other geologic material and extends from land surface to the base of the aquifer.¹¹⁶ Thus, the uppermost limit of an unconfined aquifer is the water table.¹¹⁷ While there is always a relationship between surface water and groundwater systems, the relationship is even more direct in the case of an unconfined aquifer. Thus, consumptive uses of water in this context can significantly affect both water quantity and quality.

In terms of quantity, “withdrawals of groundwater may reduce the base flow of a stream that is normally supplied by groundwater sources, thus making less surface water available for use downstream.”¹¹⁸ As a result, such withdrawals can affect the water level in streams, lakes, and wetlands. As occurred in some parts of the northern Tampa Bay area, groundwater withdrawals are capable of entirely draining surface lakes and wetlands.¹¹⁹

Surface and groundwater connections also affect quality. For example, contamination of one often leads to degradation of the other within the same hydrologic system.¹²⁰ In addition, “[r]educed rates of flow and lowered water levels often diminish the concentration of dissolved oxygen in the watercourse, impairing its ability to assimilate organic pollutants and to support fish and other aquatic life.”¹²¹ In coastal areas, groundwater withdrawals may induce saltwater intrusion, which is very difficult, if not impossible, to reverse.¹²² Furthermore, “[m]any consumptive uses of water alter the physical or chemical character of the water that is used [thus the quality of receiving waters] is inevitably affected when water is returned to the watercourse after it is used.”¹²³

115. *Id.*

116. *Id.*

117. *Id.*

118. Ausness, *supra* note 27, at 4. For example, there is increasing concern about the effects of groundwater withdrawals on Florida’s unique spring resources. *Id.*

119. See *In the Public Interest*, *supra* note 6, at 124. One landowner described the impacts of withdrawals to the area of his lakefront home to SWFWMD’s governing board:

I am not complaining to you today of lowered lake water levels — but the total and complete destruction of all water resources in our community. There is not a parallel in the recorded history of this area, under any drought condition that approaches the totality of this destruction. All surface water is gone. All wetlands and marshes are gone. Most wildlife has disappeared. The fish and the alligators are gone and now even the trees are dying.

Id.

120. Ausness, *supra* note 27, at 4.

121. *Id.* at 5.

122. *Id.*

123. *Id.*

The hydrological connections between water quantity and quality have important implications for making consumptive use decisions.¹²⁴ The drafters of the Model Water Code recognized that substantive law and administrative regulations must recognize hydrologic realities if they are to be effective.¹²⁵ Thus, it is necessary for consumptive use law to adequately address the effects of groundwater withdrawals on both surface and sub-surface systems in order to protect overall hydrologic integrity and secure the water needs of both humans and natural systems.

2. *The Tampa Bay Area's Water Issues*

Water issues in the Tampa Bay area epitomize those of many areas in Florida. The Tampa Bay region in west central Florida consists of Pinellas, Hillsborough, and Pasco counties. This area covers approximately 2,200 square miles and includes sixty miles of coastal beaches on the Gulf of Mexico and 100 miles of estuarine coastline around Tampa Bay.¹²⁶ The main cities are St. Petersburg, Tampa, and New Port Richey respectively, which are all located along the coast.¹²⁷ The Tampa Bay region has experienced some of the largest increases in population in the state, and it is continuing to grow.¹²⁸ The region is highly urbanized and developed, except for northern and eastern Pasco County and southern Hillsborough County.¹²⁹ These increases in population growth have resulted in corresponding increases in water demand.¹³⁰

The more rural, inland areas of eastern and central Pasco and northern Hillsborough counties have abundant, fresh groundwater supplies.¹³¹ In contrast, the groundwater of nearly all of Pinellas County and the western coast of Pasco County is contaminated with seawater.¹³² The communities in these coastal areas have established water transmission systems as long as thirty miles from these inland areas to supply their water needs.¹³³ With the

124. *See id.*

125. *See id.* at 6.

126. Rowland, *supra* note 5, at 416.

127. *Id.*

128. *Id.* at 418. Pasco County's population is expected to increase forty-four percent by 2010, growing from approximately 280,000 in 1990 to a projected 400,000 in 2010. *Id.* Similarly, Hillsborough County's population is expected to increase thirty-one percent by 2010, adding approximately 260,000 people to its 1.1 million in 1990. *Id.* Pinellas County's population is expected to increase seventeen percent by 2010, adding over 140,000 people to its approximate 1.0 million in 1990. *Id.*

129. *Id.*

130. *See id.*

131. *Id.* at 418.

132. *Id.*

133. *Id.*

exception of the City of Tampa, which relies on the Hillsborough River as its principal source of fresh water, all other urban areas in the region rely on groundwater sources.¹³⁴ Approximately 33% of the Tampa Bay region is urban and industrial, 42% is agricultural, and the remainder is in a natural state or is rangeland.¹³⁵ These overall land use patterns determine water allocation in the Tampa Bay region. Water is apportioned for public water supply (75%), agricultural purposes (10%), recreation (6%), and industry (6%).¹³⁶

In the past, there was not a single governmental body responsible for supplying water in the Tampa Bay region.¹³⁷ As a result, several units of government in the area competed for groundwater from the Floridian aquifer beneath Pinellas, Hillsborough, and Pasco County.¹³⁸ Eventually, these governments came together to form West Coast Regional Water Supply Authority (Authority), a water supply "wholesaler."¹³⁹ The goal of the Authority was to develop, recover, store and supply water for the area.¹⁴⁰ The Authority was authorized and obligated to acquire water and water rights, store and transport water, and deliver and sell water to its member governments for public use.¹⁴¹ Each of the Authority's member governments provided officials to sit on the governing board.¹⁴²

The Authority began to expand its regional water system by developing wellfields throughout Hillsborough and Pasco counties.¹⁴³ Originally, the Authority constructed and operated all projects to serve only one or two individual members.¹⁴⁴ However, in 1991 the Authority and its member governments entered into a water supply contract that provided for a regional approach to the development, implementation, and operation of water supplies.¹⁴⁵ Under this agreement, the Authority provided potable water to its six members at cost, who in turn served the residents of the Tampa Bay region.¹⁴⁶

134. *Id.*

135. *Id.*

136. *Id.*

137. *Id.* at 429.

138. *Id.*

139. *See* In the Public Interest, *supra* note 6, at 12.

140. Rowland, *supra* note 5, at 429.

141. *Id.* These member governments included the cities of St. Petersburg and Tampa, and Pinellas, Pasco, and Hillsborough Counties. *Id.*

142. *Id.* However, the official from New Port Richey of Pasco County was a non-voting member until the formation of Tampa Bay Water. *Id.*

143. For more history on the development of the water supply of the Authority, see Rowland, *supra* note 5, at 429-32.

144. *Id.* at 431.

145. *Id.* This contract served the entire membership, except the City of New Port Richey. *Id.*

146. *Id.* In order to finance its operations and manage its resources, the Authority had the

Between the years of 1973 and 1994, the Authority accomplished its mission of supplying water to the people of the region, a feat that most likely would have been impossible without cooperative ventures.¹⁴⁷ Around the time of the four-wellfields dispute, the Authority provided water for approximately 1.8 million people in the sixteen counties within SWFWMD's jurisdiction.¹⁴⁸ After this time period, significant disputes began to arise and the ability of the system to provide water for its users was called into question.¹⁴⁹

3. *The Four Wellfields*

The administrative dispute that is the focus of this article concerns the water use permits for four-wellfields located in the Tampa Bay area: 1) Cosme-Odesa Wellfield, 2) Section 21 Wellfield, 3) South Pasco Wellfield, and 4) Northwest Hillsborough Regional Wellfield. The Authority, or its member governments, established these wellfields as a part of the regional water supply system. A brief description of the location and permitting history of these wellfields and their hydrology is useful for understanding the dispute that resulted when scientific data confirmed that groundwater withdrawals were responsible for dramatically lowered lake and wetland levels.

Cosme-Odesa Wellfield is located in northwest Hillsborough County and is owned by the City of St. Petersburg, and, prior to the formation of Tampa Bay Water in 1999, it was jointly operated by the City and the Authority.¹⁵⁰ Cosme-Odesa had previously received two permits from SWFWMD; the most recent one was also in 1984.¹⁵¹ Section 21 Wellfield is located in northwest Hillsborough County, is owned by the City of St. Petersburg, and was jointly operated by the City and the Authority.¹⁵² Section 21 had also previously received two permits from SWFWMD, the most recent one in 1984.¹⁵³ South Pasco Wellfield is located in Southern Pasco County and was owned and operated by the City of St.

ability to engage in the following activities: raise funds by levying *ad valorem* taxes; acquire water and water rights; collect, treat, and recover, wastewater; exercise the power of eminent domain; issue revenue bonds; and borrow money. *Id.*

147. *Id.* However, this is not to say that there was not a long history of conflict over water. See generally *id.* for a more complete history of the "battles" of the water wars leading up to the four-wellfield dispute.

148. Recommended Order, *supra* note 6, at Finding of Fact No. 183.

149. See Rowland, *supra* note 5, at 432.

150. Recommended Order, *supra* note 6, at Finding of Fact No. 23.

151. *Id.* at Findings of Fact Nos. 25, 26, 50, & 52.

152. *Id.* at Finding of Fact No. 16.

153. *Id.* at Finding of Fact Nos. 18, 19, 50, & 52.

Petersburg.¹⁵⁴ Like the others, this wellfield had previously received two permits, the most recent one in 1982.¹⁵⁵ Northwest Hillsborough Regional Wellfield is located in northwest Hillsborough County and was owned and operated by the Authority.¹⁵⁶ This wellfield had previously received two permits from SWFWMD, most recently in 1988.¹⁵⁷

The geology of the four-wellfields area is essentially a three-layer structure.¹⁵⁸ The top layer is the surficial aquifer¹⁵⁹ and the bottom layer is the Floridan Aquifer.¹⁶⁰ These two layers are separated by a confining layer, which is primarily made of clay. The impermeability and thickness of clay deters movement of water between the two aquifers. However, the thickness of the confining layer varies considerably, and in some areas it is thin or nonexistent.¹⁶¹ In these areas there is potential for movement of water between the two aquifers, which is commonly referred to as "leakage."¹⁶²

The level to which water will rise in a well drilled to the Floridan aquifer is known as the "potentiometric level."¹⁶³ The sum of water levels identified through multiple wells is known as the "potentiometric surface," which essentially measures the water pressure of the Floridan aquifer and can vary depending on factors including water withdrawals from the aquifer.¹⁶⁴ The reduction of potentiometric surface by water withdrawal is referred to as "drawdown."¹⁶⁵ Drawdown can result in lowering of water levels in surface lakes, streams and wetlands.

For years, citizens in Pasco and Hillsborough County had complained that pumping at the wellfields was lowering the level of water in lakes and wetlands near their homes.¹⁶⁶ SWFWMD

154. *Id.* at Finding of Fact No. 9.

155. *Id.* at Finding of Fact Nos. 11, 51, & 52.

156. *Id.* at Finding of Fact No. 30.

157. *Id.* at Finding of Fact No. 33.

158. *Id.* at Finding of Fact No. 60.

159. The surficial aquifer is primarily made of sandy, fine-grained material. *Id.* at Finding of Fact No. 62. The level of water found in wetlands and lakes is a rough approximation of the surficial aquifer water level. *Id.*

160. The Floridan aquifer is a porous limestone formation with visible cavities and channels. *Id.* at Finding of Fact No. 63. The water of the Floridan aquifer permeates the limestone and flows within the limestone cavities and channels. *Id.*

161. *Id.* at Finding of Fact No. 67.

162. *Id.* at Finding of Fact Nos. 66-67. The possibility and extent of such leakage was not fully understood by SWFWMD until 1994. *See In the Public Interest, supra* note 6, at 144-46.

163. Recommended Order, *supra* note 6, at Finding of Fact No. 69.

164. *Id.*

165. *Id.* at Finding of Fact No. 79. The greatest drawdown occurs as the site of the well and becomes reduced with distance, resulting in a cone-shaped impact centered on the withdrawal area. *Id.* The impact is referred to as a cone of depression. *Id.*

166. *See In the Public Interest, supra* note 6, at 11. Honey Rand notes: "As pumping

previously believed staff that these lower water levels were due to other factors, such as cyclical drought.¹⁶⁷ Finally, in 1994 desperate pleas from landowners to SWFWMD's governing board led to further analysis. Although there was initially technical disagreement among SWFWMD scientists, further investigation resulted in a change in SWFWMD's policy position on relationship between the adverse environmental effects in the area and groundwater withdrawals.¹⁶⁸ The result of this change in policy was a complex political dispute between SWFWMD, the Authority, and its member governments that eventually resulted in intense litigation.

*B. Litigation Erupts: West Coast Regional Water Supply
Authority v. SWFWMD*

On February 7, 1995, SWFWMD issued a Notice of Proposed Agency Action indicating that it would grant the permits for the four-wellfields for only a one-year period.¹⁶⁹ West Coast Regional Water Supply Authority, the City of St. Petersburg, and Pinellas County (Petitioners or Applicants), challenged the proposed agency action and the matter was referred to the Division of Administrative Hearings. Hillsborough County and Pasco County were later granted leave to intervene and participate in the hearing along with SWFWMD.¹⁷⁰ On December 19, 1995, SWFWMD amended its proposed action to provide for ten-year permits with the addition of conditions including "Environmental Protection Standards."¹⁷¹ Immediately before the formal administrative hearing in July 1996, SWFWMD again revised its proposed action, changing it to denial of the four permit renewal applications.¹⁷²

increased to meet growing demand, the residents who lived near the wellfields complained of dropping lake levels and associated impacts that they claimed were caused by the wellfields. But from the early 1970s until the mid-1990s their complaints were largely ignored or refuted by government agencies." *Id.*

167. *Id.* at 145.

168. *Id.* at 144-48. Honey Rand explains:

In the end, the staff felt overwhelmingly that sufficient data existed to link groundwater pumping to surface impacts. The question was how strong was the evidence in this specific case and would it be sufficient to persuade a hearing officer [Administrative Law Judge] or a judge? Many District technicians had been ready for years to press this position inside and outside the agency. What they needed they finally got; a Governing Board willing to listen to their findings and act on it.

Id. at 148.

169. Recommended Order, *supra* note 6, at preliminary statement.

170. *Id.*

171. *Id.*

172. *Id.* This decision to deny the permits was made for strategic reasons. St. Petersburg had refused the [Southwest Florida Water Management] District's request for another

The formal administrative hearing was held over twenty-nine days in July, August, and September 1996.¹⁷³ The transcript of the hearing was filed in November of 1996 and the parties submitted proposed recommended orders.¹⁷⁴ The Administrative Law Judge (ALJ) issued his recommended order on May 29, 1997.¹⁷⁵ On June 13, 1997, the parties filed exceptions to the recommended order and agreed to extensions of time for SWFWMD to enter the final order while they engaged in settlement negotiations.¹⁷⁶

C. *The Administrative Law Judge's Recommended Order*

The Administrative Law Judge, William C. Quattlebaum,¹⁷⁷ framed the issue in the dispute as "whether applications filed for water use permits for the South Pasco, Section 21, Cosme-Odesa, and Northwest Hillsborough Regional wellfields met legal requirements."¹⁷⁸ These requirements included 373.223(1), Florida Statutes, and Rule 40D-2.301, Florida Administrative Code that govern issuance of water use permits.¹⁷⁹ In addition, the Authority asserted that it was entitled to a default permit for the Northwest Hillsborough Regional Wellfield.¹⁸⁰ Issues regarding the extent to which Florida water law prohibits adverse environmental impacts were integral to this dispute.

extension of the permitting process, and thus the [Southwest Florida Water Management] District, had two choices: issue the permits or deny them. In the Public Interest, *supra* note 6, at 254. Honey Rand explains that "[i]f [SWFWMD] issued modified permits the legal burden would be on them to prove the case." *Id.* at 255. Mark Farrel, former Assistant Executive Director of SWFWMD explained in an interview: "For us ... it was better to know. Either we went to court and we won, in which case we'd done our job, or we lost, in which case we'd appeal. If we were wrong, we were wrong. We needed to know. It was better to know. We needed to bring it to a head." *Id.* at 257.

173. Recommended Order, *supra* note 6, at introductory paragraph.

174. *Id.* at preliminary statement. See discussion of administrative hearing under Florida's Administrative Procedure Act, *supra* note 13.

175. The ALJ's findings of fact, conclusions of law, and recommendations are discussed in Part III (C), *infra*.

176. All parties are entitled to submit written exceptions to the recommended order within fifteen days of the date of the recommended order. See FLA. STAT. § 120.57(1)(i); FLA. ADMIN. CODE § 40D-1.564. SWFWMD never issued a final order, instead SWFWMD and the Authority eventually reached settlement through the formation of Tampa Bay Water, see Part III E, *infra*.

177. Administrative Law Judge, Division of Administrative Hearings.

178. Recommended Order, *supra* note 6, at statement of issue.

179. *Id.*

180. The Authority asserted that it was entitled to a default permit for the Northwest Hillsborough Regional Wellfield due to the alleged failure of SWFWMD to take action on the permit application pursuant to the requirements of FLA. STAT. § 120.60(1). *Id.* at statement of issue.

1. *Causes of Adverse Impacts*

The ALJ found that the primary cause of drawdown in the Floridan aquifer in the vicinity of the four-wellfields was the withdrawal of water by the Authority.¹⁸¹ Furthermore, he found that this drawdown had resulted in a lowering of the surficial water table as water leaked through the marginal confining layer and into the Floridan Aquifer,¹⁸² which in turn caused the lowering of areas lakes and wetlands. He explained:

While other factors including reduced rainfall and increased evapotranspiration can result in lowered lake and wetland water levels, the evidence in this case establishes that the primary cause of lowered lake and wetlands water levels in the vicinity of the subject wellfields is the withdrawal of water at the wellfields.¹⁸³

The ALJ also made findings regarding the impacts of withdrawals on wetland and surface water ecosystems in the area of the wellfields. He found that wetlands "have been and continued [sic] to be impacted by reduced water levels."¹⁸⁴ The impacts included soil oxidation and subsidence, increased invasion by exotic species, increased incidence of fire, tree loss, and the loss of habitat for wetland dependent species.¹⁸⁵ His findings were partially based upon comparison between wetlands in the vicinity of the wellfields and "control" wetlands located outside the area of the wellfields.¹⁸⁶ He noted that the control wetlands exhibited longer hydroperiods¹⁸⁷ and displayed fewer signs of ecological stress than those closer to

181. *See id.* at Finding of Fact No. 84. This finding was based on the testimony of SWFWMD's expert witnesses, the results of aquifer performance tests, and monitoring well hydrographs. *Id.*

182. *Id.* at Finding of Fact No. 90.

183. *Id.* at Finding of Fact No. 92. The Authority had argued that low rainfall was the primary cause for the lowered lake levels and adverse environmental impacts. *See id.* at Finding of Fact No. 128. It has also suggested that drainage projects and land development caused impacts to water features. *Id.* at Finding of Fact Nos. 137 & 139. These arguments were dismissed by the ALJ. *See id.* at Finding of Fact Nos. 137-44.

184. *Id.* at Finding of Fact No. 120.

185. *Id.*

186. *Id.* at Finding of Fact No. 121.

187. Water is the driving force in wetlands ecosystems. The duration of inundation in a wetland is known as the "hydroperiod." *Id.* at Finding of Fact No. 106. A decline in water table levels results in a reduction of wetland hydroperiod, which can negatively affect water-dependent wetland functions such as water storage, wildlife viability, and nutrient cycling. *Id.* Such functions are important ecosystem services that benefit humans as well as other forms of life.

the wellfields. He concluded that the environmental impacts caused by the withdrawals were “clearly adverse by any definition.”¹⁸⁸

However, despite his findings regarding the negative environmental impacts caused by withdrawals, the ALJ found that “the hydrogeologic systems in the area of the wellfields have reached ‘dynamic equilibrium.’”¹⁸⁹ He further explained, “Although clearly environmental impacts have occurred and are the result of water withdrawal, the water systems in the area of the wellfields have ‘reset’ and are now essentially stable at the lowered levels.”¹⁹⁰ This notion stands in contrast to current understandings of complex ecosystems and ideas about how they should be managed.¹⁹¹

2. Standard for Baseline: Past Adverse Impacts Are Not Considered

Perhaps the most controversial findings made by the ALJ concern the issue of “baseline.” He found that SWFWMD had adopted permitting criteria in the basis of review that established a baseline, “against which anticipated impacts may be predicted.”¹⁹² He explained that this baseline provides a point against which future impacts to a resource by a permitted water withdrawal can be measured,¹⁹³ and that this baseline also provides a standard by which the success of mitigation efforts can be measured.¹⁹⁴ The ALJ found baseline to be “those conditions, including previously permitted adverse impacts, which existed at the time of the filing of the renewal applications.”¹⁹⁵ This finding has significant implications for addressing adverse environmental impacts and is inconsistent with fundamental principles of Florida water law. As

188. *Id.* at Conclusion of Law No. 303. This statement was made in response to the permittees’ assertion that “adverse” was not defined in statute or rule. The ALJ noted that this assertion was correct, but immaterial. *Id.*

189. *Id.* at Finding of Fact No. 123. Judge Quattlebaum found: “A major water withdrawal from the Floridan aquifer results, after a period of several years, in a shifting of hydrological systems to accommodate the lowered levels. It can take as long as ten years for the changes and restabilization process to occur.” *Id.* at Finding of Fact No. 124.

190. *Id.* at Finding of Fact No. 126.

191. For example, one scientist notes: “Management has typically addressed [complex ecological] problems with equilibrium-based approaches ... and has tried to maintain these systems in some optimal state, with as little variation as possible. In some cases, this has reduced the ability of the system to respond to stresses ... and has reduced the flexibility of the agency to respond to changes in the system.” Barry Johnson, *The Role of Adaptive Management as an Operational Approach for Resource Management Agencies*, 3 CONSERVATION ECOLOGY, available at <http://www.consecol.org/vol3/iss2/art8> (last visited on Sept. 28, 2003).

192. Recommended Order, *supra* note 6, at Finding of Fact No. 147.

193. *Id.*

194. *Id.*

195. *Id.* at Finding of Fact No. 158.

one later commentator notes, this decision would have "allowed the petitioners to disregard any previous impacts and to start the permit renewal process with a clean slate."¹⁹⁶

In reaching his conclusions about baseline, the ALJ found that "environmental impacts related to the water withdrawals were known to the [Southwest Florida Water Management] District during earlier permit considerations."¹⁹⁷ He found that "in prior permit decisions the [Southwest Florida Water Management] District determined that the adverse environmental impacts were anticipated, and exempted the permittees from environmental standards which would likely have reduced the adverse impacts."¹⁹⁸ Later, the ALJ found that adverse environmental impacts resulting from water pumping occurred via water withdrawals permitted by SWFWMD "with knowledge that the adverse impacts would occur."¹⁹⁹

In addition, the ALJ emphasized that although SWFWMD had been authorized under previous permits to require mitigation of adverse environmental impacts, it did not take formal action to require mitigation.²⁰⁰ Thus, he deduced that the environmental conditions caused by withdrawal of water "were previously deemed acceptable and consistent with the public interest by the [Southwest Florida Water Management] District."²⁰¹ Furthermore, the ALJ found that there would be "no new adverse environmental impacts caused by the continuation of pumping." He explained that "the continuation of water pumping at current actual levels of withdrawal will continue the ecological decline already in progress, but will not result in new kinds of adverse impacts."²⁰²

These aspects of the ALJ's decision with regards to the legal effect of past permitting have drawn much criticism. One author notes that even if SWFWMD was aware of the extent of adverse impacts that would result from permitting withdrawals, "the court's

196. Swenson, *supra* note 1, at 385.

197. Recommended Order, *supra* note 6, at Finding of Fact No. 148. See also discussion of the legal effect of permitting, *infra*.

198. Recommended Order, *supra* note 6, at Finding of Fact No. 149. The ALJ further found that SWFWMD's "decision to exempt permittees from meeting certain criteria related to adverse environmental impacts" was a "discretionary act." *Id.* at Finding of Fact No. 150. However, SWFWMD's rules were changed to eliminate the "exemption" before the granting of the first renewal of the wells. *Id.*

199. *Id.* at Finding of Fact No. 196. The extent of this knowledge is questionable. See In the Public Interest, *supra* note 6, at 144-49 (discussing the internal debate within SWFWMD as to whether surface impacts resulted from groundwater withdrawals or other factors).

200. Recommended Order, *supra* note 6, at Finding of Fact No. 156.

201. *Id.* at Finding of Fact No. 157.

202. *Id.* at Finding of Fact No. 175. The ALJ cited examples of the ecological decline already in progress, including invasion, soil oxidation, and fires. *Id.* at Finding of Fact No. 176.

decision wrongly implies that governmental mistakes can never be amended, regardless of how harmful”²⁰³ and that “the ruling does not address the duty of the state to continually supervise water uses and to reconsider prior allocation decisions when they detrimentally affect other interests.”²⁰⁴ As will be discussed in Part IV of this article, the idea that water allocation decisions are not permanent and should be reevaluated periodically is a fundamental principle of Florida water. The ALJ’s conclusions about baseline tend to overlook this principle and are not conducive to an adaptive management approach to water policy.

3. *The Need for Public Water Supply*

In terms of realistic jurisprudence, perhaps the primary reason why the ALJ recommended renewing the permits and allowing the continuation of the existing level of pumping was because the water was being used for public water supply.²⁰⁵ Although SWFWMD had argued that the lack of proper permits did not necessarily mean that the wellfields would be closed, and that water could be pumped via emergency orders,²⁰⁶ the ALJ was concerned that SWFWMD had not made “any legally binding commitment to allow for water withdrawals outside the appropriate permitting process.”²⁰⁷

The ALJ’s concerns are partially explained by the fact that at the time of this dispute there was significant fear about the water supply for the Tampa Bay area. As a result, there was a high degree of political involvement.²⁰⁸ At one point the Mayor of Tampa, who was actively involved in efforts to secure water supply for his

203. Swenson, *supra* note 1, at 385-86.

204. *Id.* at 386.

205. Recommended Order, *supra* note 6, at Finding of Fact No. 183. The ALJ found that “the Authority supplies water to a total population estimated at 1.8 million residents,” and that “it is unlikely [that] the Authority could supply the quantities currently required without utilization of these wellfields.” *Id.*

206. *Id.* at Finding of Fact No. 188. Doug Manson, a water law attorney who mainly represented agricultural interests, noted that one of SWFWMD’s biggest mistakes was denying the public supply permits. He explained, “Denying the permits helped me paint the [Southwest Florida Water Management] District as draconian, as unreasonable.” In the Public Interest, *supra* note 6, at 285.

207. Recommended Order, *supra* note 6, at Finding of Fact No. 187. Honey Rand notes: “There was no one who actually believed the [Southwest Florida Water Management] District would turn off water to St. Petersburg’s utilities or anyone else’s. It can’t be done. According to one perspective, the hearing officer [Judge Quattlebaum] *did* believe it. According to another, the [Southwest Florida Water Management] District didn’t leave him any alternative.” In the Public Interest, *supra* note 6, at 286.

208. See generally In the Public Interest, *supra* note 6, at 286. Honey Rand’s dissertation provides an in-depth description of the complex political dimensions of the four-wellfields dispute, and she attempts to present the perspectives of all major parties that were involved. *Id.*

city, received a desperate phone call from St. Joseph's Hospital. Mayor Greco explained this incident: "They called to tell me that the water pressure was so low, they couldn't wash the babies... That is just not acceptable. Certainly not for Tampa."²⁰⁹ Given this political atmosphere, denying permits for public water supply may have been perceived as unthinkable.

It is notable that the ALJ supported only the continuation of the existing level of withdrawals, which further indicates his concern with meeting actual public water supply needs. He concluded, "The evidence establishes that the criteria are met as to the continued withdrawal of average actual daily quantities being withdrawn from the subject wellfields," yet found that the evidence failed to establish that the criteria were met as to permitting withdrawals in excess of the actual daily withdrawals.²¹⁰ While the ALJ thoroughly and accurately evaluated technical evidence about the hydrogeology of the area,²¹¹ his legal conclusions do not reflect the comprehensiveness of Florida water law. Legal analysis of the ALJ's recommended order illustrates that his decision does not reflect the complex balancing process inherent in Florida water law.

D. Potential Legal Response: Exploring the Draft Final Order

After the issuance of the ALJ's recommended order, SWFWMD and the Authority entered into extensive negotiations. The requirement that SWFWMD issue a final order within ninety days was repeatedly delayed by mutual consent. However, during this time SWFWMD staff prepared the Draft Final Order to use in the event that these settlement negotiations were unsuccessful.²¹² While the arguments and proposed conclusions of law in this Draft Final Order are not necessarily what SWFWMD would have issued

209. *Id.* at 86.

210. Recommended Order, *supra* note 6, at Conclusion of Law Nos. 308, 309.

211. Interview with John Parker, Water Use Regulation Manager, Southwest Florida Water Management District, (Feb. 25, 2003) (notes in author's possession). Honey Rand notes:

When the Hearing Officer's decision was rendered on the four-wellfield case in 1997, it was almost anti-climactic ... Each side had tried different cases, they got the same decision from the judge, and each side read that answer differently. The [Southwest Florida Water Management] District, Hillsborough and Pasco said that the science proved the wellfields were causing widespread environmental damage while the Authority, St. Petersburg and Pinellas declared victory because the judge told the [Southwest Florida Water Management] District to issue the permits at present quantities. Everyone was hoisted on a shared petard.

In the Public Interest, *supra* note 6, at 286-87.

212. The author of this article obtained a copy of this document from SWFWMD, which is now public record under Florida law. See Draft Final Order, *supra* note 7.

in a Final Order,²¹³ they provide a useful discussion of the law regarding adverse impacts under the Florida Water Resources Act.

In its Draft Final Order, SWFWMD addresses many of the ALJ's findings that it considered problematic.²¹⁴ Essentially, this Draft Final Order proposes to grant a ten-year default permit for the Northwest Hillsborough Regional Wellfield²¹⁵ and deny the permits for the other three wellfields due to noncompliance with permitting criteria. However, recognizing the need for public water supply, the Draft Final Order recommends that SWFWMD exercise its discretion under Section 373.171, Florida Statutes, to issue short-term permits authorizing water use for the other three wellfields.²¹⁶ These proposed permits would have included conditions that explicitly stated that withdrawals at existing pumpage quantities would not be allowed to continue in perpetuity.²¹⁷ The Draft Final Order's disagreements with the ALJ's recommended order fell into three categories: 1) interpretation of "the baseline for evaluating adverse environmental impacts caused by water withdrawals;" 2) "the legal effect of the SWFWMD's past permitting" for the wellfields; and 3) the determination that the criteria for issuance of permits had been met.²¹⁸ The legal arguments and determinations with regard to these three areas and the proposed temporary permitting solution are discussed below.

213. The Draft Final Order was prepared by district staff, and had not yet been approved by the Governing Board of the Southwest Florida Water Management District. Telephone interview with Mark Lapp, Assistant General Counsel, Southwest Florida Water Management District (Apr. 21, 2003) (notes in author's possession).

214. An internal SWFWMD legal memorandum explains:

My approach to this [draft] final order was to reject as few of the ALJ's findings of fact and conclusions of law as possible, because it will create less exposure for the [Southwest Florida Water Management] District to having to pay our adversaries' attorney's fees and costs if we are found on appeal to have improperly rejected or modified findings of fact In light of this, there are several findings of fact and conclusions of law which I'm sure many people here at the [Southwest Florida Water Management] District have concerns about, that I have not recommended for rejection because I felt that they arguably were supported by competent substantial evidence.

Memorandum from Mark Lapp, Assistant General Counsel, to Edward Helvenston, General Counsel, regarding Final Order for the Four Wellfields Case (Oct. 20, 1997) (on file with author). This memorandum is public record under Florida Law.

215. The ALJ found that the Authority is entitled to a default permit due to the failure of SWFWMD to properly notify the Authority of its request for an extension of the permitting deadline. Recommended Order, *supra* note 6, at Findings of Fact Nos. 269-84. The Draft Final Order does not challenge this recommendation. See generally Draft Final Order, *supra* note 7.

216. Draft Final Order, *supra* note 7, at 21.

217. *Id.*

218. *Id.* at 5. A fourth category of disagreement in the Draft Final Order was "various technical errors." *Id.*

1. *Standard for Baseline: Past Adverse Impacts Are Considered*

In the Draft Final Order, SWFWMD staff expresses disagreement with the ALJ's findings regarding baseline. The Draft Final Order explains that determining what constitutes baseline under Section 4.2 of Basis of Review requires a legal interpretation.²¹⁹ It argues that baseline applies to 1) new uses and 2) renewals "*where no impacts occurred in the past as a result of the withdrawals.*"²²⁰ The Draft Final Order concludes that the question of baseline is not legally pertinent for renewals when adverse impacts occurred in the past and are ongoing in nature.²²¹ It reasons that "if a withdrawal is causing ongoing adverse environmental impacts, it does not matter when the impacts began or to what degree of the impacts occurred prior to renewal application filing."²²² This rationale relies heavily on the plain language argument that "unmitigated adverse environmental impacts are not allowed under [Southwest Florida Water Management] District rules," as well as the overall precedent that an application causing such impacts is usually denied.²²³

However, the Draft Final Order explains that "if an applicant reduces withdrawals to a level where continued impacts are not expected to occur, or proposes an acceptable mitigation plan for the ongoing adverse impacts, a permit can be issued."²²⁴ The Draft Final Order explains that "[o]ngoing adverse impacts, even if begun under previous permits, do not become part of the baseline, and the applicant is responsible for them."²²⁵ Such ongoing adverse impacts would be considered in the review of renewal applications.²²⁶ This interpretation of baseline is more consistent with the Florida Water Resources Act's emphasis on considering the needs of both human and natural systems in allocation decisions than that of the ALJ.

219. *Id.* at 6.

220. *Id.* However, the current Basis of Review Section 4.2, entitled "Environmental Impacts," states that "[t]he withdrawal of water must not cause *unacceptable* adverse impacts to environmental features." BASIS OF REVIEW, *supra* note 102, at B4.1 (emphasis added).

221. Draft Final Order, *supra* note 7, at 7.

222. *Id.* at 6-7.

223. *Id.* at 7. The Draft Final Order notes that in most cases, uses that cause adverse impacts are denied. *Id.*

224. *Id.*

225. *Id.*

226. *Id.* Thus, the Draft Final Order rejects the Recommended Order's Findings of Fact Nos. 147 and 158 and Conclusion of Law Nos. 299 and 301, to the extent that they are contrary to the Draft Final Order's position on baseline. *Id.*

2. *Legal Effect of Past Permitting*

The Draft Final Order strongly rejects the idea that renewal permits must be issued because adverse environmental impacts resulted from water withdrawals authorized by permits issued in the past.²²⁷ It analogizes this rationale to a finding of estoppel.²²⁸ The Draft Final Order explains that while the ALJ did not explicitly justify his decision on estoppel grounds, such a rationale is implicit throughout his order.²²⁹ The Draft Final Order describes the ALJ's analysis "as being contrary to the system of water use permitting established by the Legislature in Part II of Chapter 373, Florida Statutes."²³⁰ Although the Draft Final Order does not explicitly articulate which fundamental principles the ALJ overlooked, its analysis suggests that the ALJ's decision fails to appreciate that under the Florida Water Resources Act human and ecosystems are both given significant weight and that allocation decisions must be periodically reevaluated.²³¹

As a result, the Draft Final Order concludes as a matter of law that "even if some environmental impacts resulted from water withdrawals authorized by prior permits . . . , those withdrawals and resultant impacts are not allowed in perpetuity."²³² Although the Draft Final Order disputes that SWFWMD "permitted" or "accepted" the severity or extent of adverse environmental impacts

227. See Recommended Order, *supra* note 6, at Conclusions of Law Nos. 295-301.

228. Draft Final Order, *supra* note 7, at 9. Edward de la Parte, an attorney who represented the Authority and later Pinellas county during the four-wellfields dispute, noted in an interview:

The whole case was not about whether the wellfields caused impacts ... The whole case from our perspective was, will the continuation of those withdrawals create impacts which are significantly different from what has occurred historically? The reason that was important was because the [Southwest Florida Water Management] District knew those impacts would take place, and they determined the impacts were not unacceptable.

In the Public Interest, *supra* note 6, at 284.

229. See Draft Final Order, *supra* note 7, at 8. "For example, in Finding of Fact No. 188, the ALJ found that denial of permit renewal applications is not an appropriate method for remedying adverse environmental impacts which are the result of previous permitting decisions." *Id.* Furthermore, "in Findings of Fact Nos. 198, 199 and 200, the ALJ found that the impacts from continued withdrawals will not be 'beyond those previously permitted' by the [Southwest Florida Water Management] District." *Id.*

230. Draft Final Order, *supra* note 7, at 9.

231. Honey Rand notes: "The fact that permits are required to undergo periodic review suggests that the system is there to identify any unintended consequences. If the [Southwest Florida Water Management] District has no power to modify a permit, what is the point of the review?" In the Public Interest, *supra* note 6, at 286.

232. Draft Final Order, *supra* note 7, at 8. The Draft Final Order notes that permits are for a limited duration. *Id.*

that occurred,²³³ it does not reject the findings of fact to this effect for strategic reasons.²³⁴ The Draft Final Order reasons that past permitting should be irrelevant to the issue of whether the applications meet permitting criteria.²³⁵

As further support for this rationale, the Draft Final Order explains that water use permits have a set duration²³⁶ and that "[t]here is no entitlement to continued use of water past the expiration date of a permit."²³⁷ It explains that applications for renewal permits must be given as complete a review as applications for initial permits,²³⁸ thus all of the conditions for issuance in Section 373.223(1), Florida Statutes, must be met in order for a permit to be issued.²³⁹

Much as in support of its conclusions regarding baseline, the Draft Final Order relies heavily on the plain language of SWFWMD rules, especially Rule 40D-2.301(c), Florida Administrative Code, which it describes as "unequivocal in not allowing adverse environmental impacts."²⁴⁰ The Draft Final Order emphasizes that the ALJ found that adverse environmental impacts had occurred²⁴¹ and would continue to occur with pumping at existing quantities.²⁴² It concludes that, "as a matter of law, even if some environmental impacts resulted from water withdrawals permitted in the past, the [Southwest Florida Water Management] District is not required to authorize such withdrawals in a renewal permit."²⁴³ Thus, while the

233. *Id.* at 9 n.6. In the past, "the wellfields were previously excepted from complying with environmental permitting criteria pursuant to Rule 40D-2.301(4), F.A.C. (1981), which allowed exceptions to be granted" Draft Final Order, *supra* note 7, at 9. "These exceptions were only valid for the term of the permits for which they were granted." *Id.* "Moreover, the exception provision was deleted in the 1989 amendments to Chapter 40-D2, F.A.C." *Id.* See Recommended Order, *supra* note 6, at Finding of Fact No. 57.

234. See Memorandum, *supra* note 214.

235. Draft Final Order, *supra* note 7, at 9 n.6. However, such reasoning may lead to unfair results. As is discussed in part IV(C) (3), *infra*, it may be necessary for water management districts to develop permitting criteria that consider economic investment and the reliance of permittees while reevaluating permitting decisions. While in some situations environmental factors may outweigh economic considerations, it may be necessary to use more equitable remedies to assure fairness.

236. Draft Final Order, *supra* note 7, at 8. See also FLA. STAT. § 373.236 (2002) (duration of permits).

237. Draft Final Order, *supra* note 7, at 8. See also *Davey Compressor Co. v. City of Delray Beach*, 613 So. 2d 60, 62 (Fla. 4th DCA 1993) (holding that there is no entitlement to continued use of water past permit expiration date).

238. FLA. STAT. § 373.239(3).

239. Draft Final Order, *supra* note 7, at 8. The Draft Final Order also explains that the reasonable beneficial use and public criteria conditions of § 373.223(1), Florida Statutes, were not satisfied. *Id.*

240. *Id.* at 10.

241. See Recommended Order, *supra* note 6, at Findings of Fact Nos. 159, 162, & 165.

242. See *id.* at Findings of Fact Nos. 175 & 176.

243. Draft Final Order, *supra* note 7, at 10. The ALJ found it significant that SWFWMD

Draft Final Order does not reject the factual aspect of some relevant findings of fact,²⁴⁴ it explicitly rejects the ALJ's legal implications that a right to withdraw water extends beyond the permit duration and that the issuance of past permits ensure that criteria will be met for a renewal permit.²⁴⁵

3. Compliance with Permitting Criteria

The Draft Final Order disputes the ALJ's determination that the wellfields met all pertinent permitting criteria.²⁴⁶ It rejects the ALJ's findings and conclusions regarding the applicants' compliance with the environmental conditions for issuance under Rule 40D-2.301(1)(c), Florida Administrative Code, the reasonable-beneficial use prong of Section 373.223(1)(a), Florida Statutes, and the public interest prong of Section 373.223(1)(c), Florida Statutes. The Draft Final Order concludes that whether an applicant has met the permitting criteria is a mixed question of law and fact for which SWFWMD has greater latitude to reject the ALJ's findings.²⁴⁷

The Draft Final Order concludes that pumping that causes ongoing adverse impacts, as found by the ALJ, violates SWFWMD

had not taken any enforcement action relating to the subject wellfields during the terms of the existing permits, as suggested by the Recommended Order's Findings of Fact Nos. 153-156. *Id.* The Draft Final Order concludes as a matter of law that failure of SWFWMD to take enforcement action during the prior term of a permit poses no bar, and is irrelevant to SWFWMD denying a permit renewal application, or limiting a renewed permit. *Id.* at 9-10.

244. See Recommended Order, *supra* note 6, at Findings of Fact Nos. 188, 198, 199, & 200. See also Draft Final Order, *supra* note 7, at 10.

245. The Draft Final Order notes that the water use permitting rules were amended in 1989 to require permit applicants to assume responsibility for both on-site and off-site impacts related to water withdrawals, and to consider the cumulative impacts of withdrawals. Draft Final Order, *supra* note 7, at 9. The Draft Final Order explains that the applicants were subject to the amended rules for the renewal applications, and that the fact that permits were issued previously for three of the wellfields under a different set of rules and pursuant to exceptions is irrelevant to the "mixed legal and factual determination" of whether the applicants complied with the current set of rules for the permit applications. *Id.*

246. The Draft Final Order notes: "Because of the ALJ's erroneous determination on the baseline issue and the related determination that because of the permitting history of these wellfields the [Southwest Florida Water Management] District was constrained to issue renewal permits, the ALJ found that the Applicants ... met all pertinent permitting criteria at the current actual withdrawal quantities." *Id.* at 10-11.

247. *Id.* at 11. See *Harloff v. City of Sarasota*, 575 So. 2d 1324, 1328 (Fla. 2d DCA 1991) (finding that determining reasonable beneficial use is a mixed question of law and fact and that an agency's decision on such a mixed question is entitled to increased weight when it is infused by policy considerations for which the agency has special responsibility); *Fla. Power Corp. v. State Dep't of Env'tl. Regulation*, 638 So. 2d 545, 561 (Fla. 1st DCA 1994) (holding that the DEP Secretary correctly rejected a hearing officer's [ALJ's] conclusion of law that mitigation was unnecessary for a proposed project); *McDonald v. Dep't of Banking & Fin.*, 346 So. 2d 569, 579 (Fla. 1st DCA 1977) (explaining that where ultimate facts are matters infused with policy considerations for which the agency has special responsibility, a reviewing court should give correspondingly less weight to the hearing officer's findings).

rules.²⁴⁸ Although the ALJ found that the adverse environmental impacts caused by the applicants' withdrawals at the wellfields would continue with sustained pumping at current quantities,²⁴⁹ it also found that no new adverse environmental impacts would result from continued pumping.²⁵⁰ In order to understand this seeming inconsistency, the Draft Final Order interprets this finding to mean "new *kinds* of adverse environmental impacts."²⁵¹ In response, it concludes that SWFWMD rules prohibit not only "new kinds of adverse environmental impacts," "new adverse environmental impacts," or "impacts beyond those previously permitted," but rather they prohibit "*any* adverse environmental impact."²⁵² The Draft Final Order applies the Basis of Review and concludes that the applicants failed to meet permitting criteria.

In addition, the Draft Final Order concludes that applicants did not satisfy the reasonable beneficial use prong of the conditions for issuance of permits under Section 373.223(1)(a), Florida Statutes. The Draft Final Order explains that the "public interest" prong of Section 373.223(1)(c), Florida Statutes, is a component of the reasonable beneficial use prong.²⁵³ The Draft Final Order concedes that, under the reasonable beneficial use standard, the applicants' use of water was *for a purpose* that was both reasonable and consistent with the public interest.²⁵⁴ However, it concludes that the withdrawals were not done *in a manner* that was both reasonable and consistent with the public interest, because of the ongoing adverse impacts the withdrawals had caused and would continue to cause.²⁵⁵ Thus, the Draft Final Order concludes that the ALJ too narrowly construed the reasonable beneficial use prong by failing to consider the *manner* in which withdrawals are made and the resulting impact on natural resources.²⁵⁶

248. Draft Final Order, *supra* note 7, at 13.

249. See Recommended Order, *supra* note 6, at Findings of Fact Nos. 175 & 176.

250. See *id.* at Findings of Fact Nos. 174, 198, 199, & 200.

251. Draft Final Order, *supra* note 7, at 11. In Findings of Fact 175, the ALJ stated that continuation of pumping at current actual levels of withdrawal will continue the ecological decline already in progress, but will not result in new kinds of adverse environmental impacts. *Id.* Because the ALJ listed several specific adverse environmental impacts that would occur as a result of continued pumping in Finding of Fact No. 176, the Draft Final Order concludes that he could not have meant in Findings of Fact Nos. 174, 198, 199, & 200 that no adverse environmental impacts would occur as a result of continued pumping. *Id.* at 12.

252. *Id.* See FLA. ADMIN. CODE r. 40D-2.301(1)(c) (2003).

253. See Draft Final Order, *supra* note 7, at 14; see also FLA. STAT. § 373.019(13) (2002).

254. Draft Final Order, *supra* note 7, at 14.

255. *Id.* See also FLA. STAT. § 373.019(13) (defining reasonable beneficial use).

256. Draft Final Order, *supra* note 7, at 15 n.5. As additional authority, the Draft Final Order notes that the preamble of SWFWMD's conditions for issuance of permits in Rule 40D-2.301, Florida Administrative Code, makes it clear that the environmental impacts of

Similarly, the Draft Final Order concludes that ongoing adverse environmental impacts are not consistent with the public interest prong of the conditions for issuance of permits in Section 373.223(1), Florida Statutes.²⁵⁷ The Draft Final Order explains that the public interest is a broad concept²⁵⁸ that requires the consideration of factors including, but not limited to, the applicant's need for water, the effect of the withdrawals on others, the ability of the water resource to sustain the applicant's withdrawals combined with others' withdrawals, and the effect which the applicant's withdrawals will have upon lakes, wetlands, fish, wildlife and other natural resources.²⁵⁹ The Draft Final Order emphasizes the need to balance all these factors and concludes that, due to the severity of ongoing adverse environmental impacts in the four-wellfields area, continuation of pumping at existing levels is not in the public interest.

4. SWFWMD's Proposed Temporary Permitting Solution

The Draft Final Order proposes granting a ten-year default permit for the Northwest Hillsborough Regional Wellfield and three-year permits for the other three wellfields at existing pumpage quantities. Despite its conclusions that permitting criteria were not met for the three wellfields, the Draft Final Order recognizes the strong need for public water supply. It notes that "[d]enying these permits and immediately shutting down these wellfields for failure to meet the permitting criteria would result in harm to the public

withdrawals are considered when determining reasonable beneficial use. *Id.* at 14. The rule states that an applicant must demonstrate compliance with the statutory three-prong test by satisfying the fourteen criteria in the rule, which include environmental impact considerations. *Id.* at 14-15.

257. *Id.* at 13. The Draft Final Order cites *Fla. Power Corp. v. State Dep't of Env'tl. Regulation*, 638 So. 2d 545, 546 (Fla. 1st DCA 1994) (holding that whether an impact to a wetland was "not contrary to the public interest" was a policy matter for the agency's determination and not a question of fact to be resolved by the hearing officer [ALJ]). *Id.*

258. The Draft Final Order disagrees with the ALJ's characterization of the public interest prong:

In finding of Fact No. 182 the ALJ too narrowly construed compliance with the public interest prong. He seems to say that provision of water for public supply will always be consistent with the public interest within the context of Section 373.223(1)(c), F.S. To say that the provision of water to citizens is consistent with the public interest, while true, does not completely resolve compliance with the public interest prong of the conditions for issuance in Section 373.223(1), F.S. The public interest prong includes consideration of a host of factors, as just stated, including effects on the water resources, including environmental features. Balancing of these complex and competing interests are [sic] the province of the Governing Board.

Id. at 13 n.8.

259. *Id.* at 13.

health, safety, and welfare and the interests of the water users affected.”²⁶⁰ Thus, the Draft Final Order proposes to issue permits pursuant to SWFWMD’s discretionary authority under Section 373.171, Florida Statutes.²⁶¹ The Draft Final Order reemphasizes that the ongoing adverse environmental impacts caused by withdrawals are unacceptable, but it states that SWFWMD has “no choice but to authorize withdrawals under its authority in Section 373.171, F.S.”²⁶²

Although the Draft Final Order suggests that it would be appropriate for SWFWMD to exercise its discretion to issue permits authorizing water use, it concludes, as a matter of law, these permits should only be issued for a short duration.²⁶³ In addition, under the Draft Final Order, the proposed permits would contain explicit conditions and a clear expression of SWFWMD’s intent that withdrawals at existing pumpage are not necessarily allowed to continue into perpetuity.²⁶⁴

With regard to conditions, the Draft Final Order requires that the permittees reduce withdrawals from the three wellfields in order to reduce, eliminate, or avoid adverse environmental impacts.²⁶⁵ Furthermore, it provides that reasonable present and future demands should be satisfied solely from environmentally sustainable sources of supply, thus requiring the maximization of reuse and conservation measures.²⁶⁶ The Draft Final Order requires

260. Draft Final Order, *supra* note 7, at 21.

261. *Id.* FLA. STAT. § 373.171 (1997) provides in relevant part:

(1) In order to obtain the most beneficial use of the water resources of the state and to protect the public health, safety, and welfare and the interest of the water users affected, governing boards, by action not inconsistent with the other provision of this law and without impairing property rights, may:

(a) Establish rules, regulations, or orders affecting the use of water, as conditions warrant...

(c) Make other rules, regulations, and orders necessary for the preservation of the interest of the public and of affected water users.

Id. This provision has been modified somewhat. See, e.g., FLA. STAT. § 373.171(c) (2002) (stating that governing boards may “[i]ssue orders and adopt rules pursuant to ss. 120.536(1) and 120.54 to implement the provisions of this chapter”). This change may have been to avoid an invalid exercise of delegated legislative authority. See generally FLA. STAT. § 120.52(8).

262. Draft Final Order, *supra* note 7, at 29. The Draft Final Order warns that “this permitting situation is unique, so no member of the regulated public can or should expect a permit for situations which they consider to be similar to the subject situation.” *Id.* at 30.

263. *Id.* at 27.

264. *Id.* at 21. The ALJ found that “[t]o the extent the Authority was directed in prior and somewhat vague permit conditions to consider alternative sources, the evidence establishes that the Authority has complied with the minimal directives provided by the [Southwest Florida Water Management] District.” Recommended Order, *supra* note 6, at Finding of Fact No. 54.

265. Draft Final Order, *supra* note 7, at 21.

266. The Draft Final Order specifically notes that savings from reuse and conservation

the development of alternative sources²⁶⁷ of supply in order to reduce withdrawals to meet permitting criteria.²⁶⁸ An additional proposed condition in the Draft Final Order requires the permittees to prepare a plan to reach compliance with permit conditions and to present written and oral progress reports to the Governing Board.²⁶⁹

In terms of permit durations, the Draft Final Order emphasizes that SWFWMD is not restricted to a ten-year permit.²⁷⁰ The Draft Final Order notes that the initial and renewal permits for the four wellfields varied in duration and that the permitting history shows that SWFWMD is not restricted to a ten-year permit.²⁷¹ The Draft Final Order explains that the goal was to reduce pumping from the wellfields so that permitting criteria could be met, and that short duration permits are a better tool for achieving this goal.²⁷²

The Draft Final Order interprets the ALJ's Recommended Order as allowing SWFWMD to require mitigation for past adverse environmental impacts.²⁷³ Accordingly, the Draft Final Order suggests that the permittees be required to devise and implement a plan to mitigate the adverse environmental impacts that the wellfields have caused in the past, and will continue to cause in the future.²⁷⁴ This interpretation raises issues about the treatment of adverse environmental impacts under Florida water law and the

should apply toward reductions in withdrawals from the three wellfields and not be applied toward servicing future growth. *Id.* at 22. The Draft Final Order also notes that the previously issued permits contained a condition indicating that implementing conservation measures is an ongoing obligation. *Id.* at 23.

267. The Draft Final Order notes that "the requirement to explore alternative sources is not a new one." *Id.* at 23. While the Draft Final Order does not reject the ALJ's finding of fact that it takes from seven to ten years to bring new water supply facilities from the planning stage to operation, which was supported by competent substantial evidence, it suggests that it may be possible to develop new water supplies in less time. *See id.* at 29.

268. *Id.* at 22.

269. The Draft Final Order explains that these requirements were similar to a condition in the existing permit for the Cosme-Odesa and Section 21 wellfields. *Id.* at 21.

270. The Draft Final Order does not reject the ALJ's finding of fact that public water supply permits are typically valid for a period of ten years because it was supported by competent substantial evidence. *Id.* at 27.

271. *Id.* The Cosme-Odesa and Section 21 wellfields were initially permitted for a little over four years, and were renewed for eight and a half years. *Id.* South Pasco was initially permitted for two and a half years and was renewed for ten years. *Id.* Northwest Hillsborough Regional Wellfield was initially permitted for three and a half years, and was renewed for six years. *Id.*

272. *Id.*

273. *See* Recommended Order, *supra* note 6, at Finding of Fact No. 201 (finding that SWFWMD has the ability to require mitigation through conditions attached to prior permits and that SWFWMD has the authority to continue to attach mitigation conditions to the permits issuing from this proceeding). The Draft Final Order also cites the wording of the Recommended Order's Findings of Fact Nos. 202 and 243 to support the conclusion that SWFWMD can require mitigation for past adverse environmental impacts. Draft Final Order, *supra* note 7, at 29-30 n.15.

274. Draft Final Order, *supra* note 7, at 29-30 n.15.

nature of water policy in the state. As discussed *infra*, many of the legal interpretations presented in the Draft Final Order are consistent with the overall design of Chapter 373, Florida Statutes, and the intent of the drafters of the Model Water Code.

E. Resolution of the Four-Wellfields Dispute: The Formation of Tampa Bay Water

After extensive negotiations, the dispute underlying the four-wellfields case was resolved in 1999 as a part of the transformation of the Authority into a more effective regional water management institution.²⁷⁵ An inter-local agreement, known as the "water accord," created a new institutional relationship to replace the Authority as the water supply entity for the region.²⁷⁶ This transformation included a plan to compensate the Authority's member governments for installed water supply capacity, the ownership and control of which was shifted to the new water authority, Tampa Bay Water.²⁷⁷ The transformation was made possible by approximately \$273 million in SWFWMD funding, which was provided for non-groundwater supply infrastructure in an effort to reduce pumping and ameliorate adverse environmental affects in the area.²⁷⁸

The restructuring included changes to voting, membership, terms of office, responsibilities, facilities ownership and management, and the creation of a twenty-year water supply development plan.²⁷⁹ Through the agreement that formed Tampa Bay Water, all member governments relinquished the right to develop their own water supply sources and agreed to limit their opposition to future water projects.²⁸⁰ If disputes among governments and Tampa Bay Water cannot be resolved within thirty-days, a mutually acceptable neutral third party acts as a mediator.²⁸¹ The structure of the relationship between SWFWMD and Tampa Bay Water has not changed substantially in the sense

275. See Rowland, *supra* note 5, at 440.

276. *Id.* at 441.

277. *Id.*

278. *Id.* at 440.

279. *Id.* at 441. Tampa Bay Water is governed by a nine member board, two members from each of the three counties involved in the four-wellfields dispute, and one member from each of the cities of Tampa, St. Petersburg, and New Port Richey. *Id.* Tampa Bay water created a uniform rate for all of its customers. *Id.* "Each board member has one vote and decisions are made according to majority rule," which is an improvement over the Authority's previous structure where every funding decision had to be unanimous and one party had the ability to prevent a project. *Id.*

280. *Id.* at 441-42.

281. *Id.* at 442.

that “the [Southwest Florida Water Management] District is still the regulator and the Authority is still the single largest permittee in Tampa Bay.”²⁸² However, the communication practices have changed, and for the most part, “shared concern” for the development of new waters supplies has replaced the public disagreements.²⁸³

In addition, there were significant changes to the permitting structure for the area. All the public supply wellfield permits in the area were combined into one permit. This consolidated permit is structured so that there are “cutbacks” in pumping quantities over time. Thus, as new alternative water sources become available, groundwater withdrawals and environmental impacts are reduced.²⁸⁴ Furthermore, the changes to the permitting system allow more flexibility in the management of the water supply system.²⁸⁵ One author notes that as the result of regional cooperation, the Tampa Bay area “now has the institutional means to acquire the additional water supply needed to meet its projected demand, while protecting the environment against adverse impacts, and operating within state and federal law.”²⁸⁶

IV. IMPLICATIONS OF WATER LAW REGARDING ADVERSE ENVIRONMENTAL IMPACTS FOR PROTECTING ECOSYSTEMS

The four-wellfields dispute illustrates the challenge of reconciling human and ecosystem water needs and balancing the goals of certainty and flexibility under the Florida Water Resources Act. This part of the article discusses relevant provisions of the Act and the writings of the drafters of the Model Water Code in an effort to further define this delicate balancing process. It also suggests that principles of adaptive management, which have gradually been

282. In the Public Interest, *supra* note 6, at 16.

283. *Id.*

284. *Id.* at 338. Prior to the partnership agreement, the total annual average permitted withdraw was 192 mgd. See Tampa Bay Water, *Tampa Bay Water Ahead of Schedule in Reducing Wellfield Production*, at http://www.tampabaywater.org/WEB/Htm/News/news_2Januay2003.htm [sic]. Cutbacks were scheduled to total annual average permitted withdraw of 121 mgd by January 2003 and 90 mgd by January 2008. *Id.*

285. Tampa Bay Water currently employs a program known as the Optimized Regional Operations Plan (OROP). See Tampa Bay Water, *Optimized Regional Operations Plan*, at <http://www.tampabaywater.org/WEB/Htm/Ops/orop2.htm>. This plan attempts to minimize adverse environmental impacts by using computer models to analyze and forecast groundwater conditions at water supply facilities. *Id.* Based on field monitoring and these forecasts, groundwater withdrawals are “rotated” or adjusted to avoid ecological harm to any one facility. *Id.* The OROP has been described as the “most comprehensive wellfield management plan in the state of Florida,” and was implemented as a part of the consolidated permit for the eleven wellfields in Pasco, Pinellas, and northern Hillsborough counties. *Id.*

286. See Rowland, *supra* note 5, at 442.

incorporated into water management decisions in the Tampa Bay area, are useful for addressing adverse environmental impacts caused by public water supply withdrawals.

A. The Full Meaning of the Reasonable Beneficial Use Standard

As discussed above, the drafters of the Model Water Code attempted to combine the best aspects of eastern and western water law. The writings of the drafters indicate that the reasonable beneficial use standard incorporates decision-making factors that have long been part of the reasonable and beneficial use standards respectively. One of the drafters notes in a later article that when the Florida legislature adopted the term "reasonable beneficial use," its intent was to rely on the technical common law meaning of the terms "reasonable use" and "beneficial use" to guide and constitutionally limit administrative determinations.²⁸⁷ Thus, there is a strong argument that these factors are inherent in Florida's water law system.²⁸⁸ In any event, these factors are useful for considering how to balance human and ecosystem needs and the goals of certainty with that of flexibility. These factors can also aid administrative agencies in making consumptive use decisions that could potentially cause adverse environmental impacts.

"Administrative regulations establishing guidelines for consumptive use permitting in Florida should be consistent with the factors" associated with the "reasonable" and "beneficial use" standards.²⁸⁹ These factors should at least include the following: 1) the purpose of the use; 2) economic value of the use; 3) social value of the use, including the suitability of the watercourse; 4) the extent and amount of harm caused by the use; and 5) the practicality of avoiding the harm through adjusting the quantity and method of the use.²⁹⁰ These factors are useful when attempting to balance human and ecosystem needs and the goals of certainty and flexibility.

287. *Florida's Reasonable Beneficial Water Use Standard*, *supra* note 18, at 276.

288. The Model Water Code's commentary indicates that "reasonable beneficial use" ought to be interpreted in light of the long history of judicial determination of water uses in each system. *Id.* at 275-76. The terms reasonable use and beneficial use are "clothed with common law meaning," and "each term serves as a legal shorthand for the factors articulated and weighed by the courts determining the legality of a use." *Id.*

289. *Id.* at 278.

290. *Id.* These factors are very similar to those identified in the Restatement Second of Torts. See *Law and Policy in Managing Water Resources*, *supra* note 1, at 303.

*B. Balancing Human and Ecosystem Needs**1. Language of the Florida Water Resources Act*

Throughout the Florida Water Resources Act there are references to the importance of addressing the water needs of both human and natural systems. The Act emphasizes the need “[t]o preserve natural resources, fish and wildlife.”²⁹¹ According to one set of authors: “[c]onsumptive use permitting provides one of the principal means for the districts to regulate human activities that might adversely affect [fish, wildlife, and natural] resources.”²⁹²

Several significant legislative amendments that were made in 1997 further emphasize the need to comprehensively manage water by considering natural systems.²⁹³ For example, the declaration of policy section of the statute contains a new provision that the Department take into account “cumulative impacts on water resources and manage those resources in a manner to ensure their sustainability.”²⁹⁴ Furthermore, the 1997 legislature declared the State’s policy “to promote the conservation, replenishment, recapture, enhancement, development and proper utilization of surface and ground water.”²⁹⁵ Changes that were made to Section 373.0361(1), Florida Statutes, require districts to undertake water supply planning when it determines that sources of water are not adequate “to supply water for all existing and projected reasonable-beneficial uses and to sustain the water resources and related natural systems.”

Although this article focuses on Part II of Chapter 373, Florida Statutes, Part IV of Chapter 373, which governs the management and storage of surface waters, has relevancy. Part IV authorizes the districts to:

require permits and impose such reasonable conditions as are necessary to assure that the construction or alteration of any stormwater management system, dam, impoundment, reservoir, appurtenant work, or works will comply with the provisions of this part and applicable rules

291. FLA STAT. § 373.016(3)(g) (2002).

292. Hamann & Ankersen, *supra* note 89, at 42.

293. Draft Final Order, *supra* note 7, at 24. These amendments incorporated and expanded many of the tasks required of SWFWMD by Executive Order No. 96-297 that was issued on September 30, 1996. *Id.* For discussion of the 1997 amendments to the Florida Water Resources Act, see generally Frank Matthews & Gabriel Niego, *Florida Water Policy: A Twenty-Five Year Mid-Course Correction*, 25 FLA. ST. U. L. REV. 365 (1998).

294. FLA. STAT. § 373.016(2).

295. *Id.* at § 373.013(3)(b).

promulgated thereto and will not be harmful to the water resources of the district.²⁹⁶

The broad definition of terms within this provision allows the districts to regulate a number of human activities.²⁹⁷

One pair of authors notes that:

[a]lthough Part II . . . provides an adequate basis to address the environmental impacts of water use, the fact that F.S. Ch. 373 is amenable to an interpretation that places consumptive uses within the surface water management regulatory framework underscores the fundamental relationship between wetlands and water supply development."²⁹⁸

Such an interpretation is consistent with the focus of the drafters on developing a legal system that attempts to maintain overall hydrologic integrity.

2. *Intent of the Drafters of the Model Water Code*

"The drafters of the Model Water Code attempted to ensure that water use and water quality problems were not segregated at the regulatory level,"²⁹⁹ and this intent is embodied in the Water Resources Act. In terms of balancing human and ecosystem water needs, the drafters emphasized the importance of administrative expertise for more thorough and comprehensive analysis in allocation decisions. One drafter explains in a later article: "[t]he statutory emphasis on preservation of environmental values should be incorporated into any guidelines developed with respect to a permit program to prevent possible inadvertent omission of environmental considerations."³⁰⁰ This drafter also emphasizes that the Florida Supreme Court "has clearly recognized the need for and

296. Hamann & Ankersen, *supra* note 89, at 44 (citing FLA. STAT. § 373.413).

297. For example, "works of the district" is broadly defined as "all artificial structures, including, but not limited to . . . pipes and other construction that connects to, draws water from, drains water into, or is placed in or across the waters in the state." FLA. STAT. § 373.403(5). The term "waters in the state" is comprehensively defined to include all ground and surface water. *Id.* at § 373.019(17).

298. Hamann & Ankersen, *supra* note 89, at 45. They note that Part II and Part IV of Chapter 373, Florida Statutes, when read together, suggest that diversions or withdrawals that result in adverse hydrologic impacts to surficial wetlands may be subject to surface water management permitting requirements under Part IV and implementing rules. *Id.*

299. Ausness, *supra* note 27, at 17.

300. See *Florida's Reasonable Beneficial Water Use Standard*, *supra* note 18, at 280.

ability of administrative agencies to make water allocation decisions without judicial approval of each decision.”³⁰¹

Administrative decisions should incorporate consideration of the common law factors identified in Part IVA, *supra*. The public interest component of the Act embodies the “social value” and “suitability” factors.³⁰² “The social value factor includes considerations of public health and welfare” as well as watercourse suitability.³⁰³ In terms of the “purpose of use” factor, consumptive use decisions must provide for “the protection and procreation of fish and wildlife” as well as domestic and municipal uses.³⁰⁴ The “economic value” factor should be considered in further defining economic and efficient utilization.³⁰⁵

In addition to generally supporting deference to administrative decision-making processes, commentary to the Model Water Code lends support to specific legal conclusions suggested in the Draft Final Order. The Draft Final Order explains that under the reasonable beneficial use standard, the manner in which water is diverted must also be reasonable and consistent with the public interest. Similarly, the drafters noted in the commentary accompanying the Model Water Code: “[t]his part of the standard would apply to some aspect of the manner of operation, such as place of diversion, manner of impoundment, or method of disposal (including danger of pollution), as opposed to the purpose of the entire operation itself.”³⁰⁶ Thus, as the Draft Final Order argues, a strong need for public water supply does not necessarily mean that it is a reasonable and beneficial use, especially when it causes severe environmental impacts.

Other commentary by the drafters of the Model Water Code supports the Draft Final Order’s emphasis on the protection of natural systems through both the reasonable beneficial use prong and the public interest prong. The drafters specifically noted in the Code’s commentary that “a proposed use, otherwise valid, which would have an unreasonably harmful effect on fish or wildlife might well be rejected as being inconsistent with the express statement of

301. *Id.* at 276. In *Village of Tequesta v. Jupiter Inlet Corp.*, the Florida Supreme Court considered the reasonable beneficial standard. *Id.* The court held: “[t]he Water Resources Act now controls the use of water and replaces the ad hoc judicial determination in water management districts where consumptive use permitting is in force.” *Id.* (quoting *Village of Tequesta*, 371 So. 2d 663, 674 (Fla. 1979)). The drafters interpreted this decision as recognizing the need for administrative agencies to make water allocation decisions without judicial approval of each decision. *Id.* at 277.

302. *Id.*

303. *Id.* at 279.

304. *Id.*

305. *Id.* at 276.

306. MODEL WATER CODE, *supra* note 3, at 172.

public interest in the protection of fish and wildlife found in §1.02 [of the Model Water Code].³⁰⁷

3. *The Importance of Addressing Adverse Impacts*

The drafters of the Model Water Code attempted to establish a regulatory structure that would take the entire hydrologic cycle into account.³⁰⁸ The Code's permit system was designed to implement this objective at the operational level.³⁰⁹ In order for the Florida Water Resources Act to achieve the goal of hydrologically sound water management it must adequately address the adverse environmental effects that consumptive uses can have on water quantity and quality.

To better implement hydrologically sound water management, consumptive use regulation must consider the entire hydrologic cycle and the physical relationships between water use and water quality.³¹⁰ Thus, it is necessary for water management districts to regulate consumptive uses that cause adverse impacts, even those that have already occurred as a result of past permitting decisions.³¹¹ Water withdrawals that cause adverse impacts can seriously impact water quantity and quality and affect humans as well as ecosystems. For example, the owner of a lakefront home can be harmed when withdrawals cause the lake to go dry. Due to the fact that aquatic ecosystems, especially wetlands, play an important role in water purification and groundwater recharge, the overall quality of surface and groundwater may be affected by groundwater withdrawals.

While the four-wellfields dispute involved the lowering of wetland and lake levels, adverse environmental impacts resulting from consumptive use can take many forms. Saltwater intrusion is

307. *Id.* at 179. Section 1.02 of the Model Water Code states in relevant part that "adequate provision shall be made for the protection and procreation of fish and wildlife, the maintenance of proper ecological balance and scenic beauty ... such objectives are declared to be in the public interest." *Id.* at 3.

308. Ausness, *supra* note 27, at 13.

309. *Id.* One drafter explains:

According to the Code, the governing board of the appropriate water management district had to authorize virtually all withdrawals, diversions or impoundments of water. The Code's definition of water included: contained surface water, diffused surface water, and groundwater. The Code's regulatory provisions extended to all forms of water, except coastal waters, and also required all water users, except domestic users, to obtain a permit.

Id. at 16.

310. *Id.*

311. As is discussed *infra*, such decisions may have fairness concerns that must be adequately addressed by the water management districts.

another potential result of withdrawals that can have devastating and irreversible consequences. Only by addressing adverse environmental impacts through prevention, minimization, and, when necessary, compensatory mitigation, can the full potential of the Florida Water Resources Act to ensure human and ecosystem water needs be realized.

Issues concerning the importance of offsetting adverse environmental impacts through compensatory mitigation are raised in a recent order of the South Florida Water Management District (SFWMD).³¹² Miami-Dade County applied for a renewal for a large wellfield that it operated in the Everglades.³¹³ The wetland functions of the area had been degraded due to the effect of groundwater withdrawals from the pumping, mining, drainage, and infestation with melaleuca,³¹⁴ a highly invasive exotic species. The county sought a variance from the provisions of SFWMD's rules that prohibit causing adverse environmental impacts and proposed mitigation.³¹⁵ SFWMD determined that a variance was appropriate, and agreed to allow compensatory mitigation to compensate for future expected impacts.³¹⁶ Notably, SFWMD did not consider the mitigation of existing impacts.³¹⁷

In its analysis, SFWMD articulated an interpretation of its rules that may be problematic. It stated that there is a general goal of maximizing the reasonable beneficial use of water and "in maximizing the reasonable-beneficial development of water resources, harm may be permitted to a certain extent after the potential for harm has been minimized and mitigated, if the other factors considered in the balancing outweigh the impact of the harm."³¹⁸ One author has expressed concern that, under this interpretation of the statute, it is not clear that a variance, or even mitigation, would be required if the district finds that the need for

312. Richard Hamann, *Consumptive Use Permitting Criteria*, FLORIDA ENVIRONMENTAL AND LAND USE LAW 14.2-1, 14.2-8 & 14.2-9 (2001) [hereinafter *Consumptive Use*]. In that treatise article, Hamann explores the potential implications of a final order from the South Florida Water Management District: In re Petition for Variance for Miami-Dade County's Water Use Permit No. 13-0037-W for the Northwest Wellfield, Order No. SFWMD 99-14 DAO-WU, 99 ER F.A.L.R. 092, February 11, 1999 [hereinafter *In re Petition for Variance*]. The distinction between the South Florida Water Management District (SFWMD) and the Southwest Water Management District (SWFWMD) in this part of the article is noteworthy.

313. *Consumptive Use*, *supra* note 312, at 14.2 to 14.8.

314. *Id.*

315. *Id.* at 14.2 to 14.8 & 14.2 to 14.9. See FLA. STAT. §120.542(2) (2002) (providing for variances). Under that section, a variance must be granted if the applicant can demonstrate application of the rules would impose a "substantial hardship" and that the purpose of the underlying statute will be achieved by other means. *Id.*

316. *Consumptive Use*, *supra* note 312, at 14.2 to 14.8 & 14.2 to 14.9.

317. *Id.*

318. *In re Petition for Variance*, *supra* note 312, at Conclusion of Law No. 69.

water is greater than the cost of offsetting or avoiding environmental harm.³¹⁹

In addition, SFWMD is currently engaged in rulemaking, including amendments to its Basis of Review.³²⁰ Draft Section 3.3.6 of the Basis of Review is entitled "Mitigation of Harm." It notes that SFWMD "shall assess the condition of the wetland or other surface water as it exists at the time of the application submittal when determining mitigation requirements."³²¹ However, additional considerations are required for the renewals of consumptive use permits in Section 3.3.7.³²² This section reflects a cost-benefit approach by requiring consideration of the "projected impacts on . . . wetlands or other surface water from continuing the water use;"³²³ in comparison to the remaining functions of the wetlands or other surface waters. While it is laudable that this rule at least recognizes the importance of considering adverse environmental impacts resulting from consumptive use, the scope of the analysis it requires is problematic. By focusing only on "remaining functions," the rule ignores functions that do not currently exist, but

319. *Consumptive Use*, *supra* note 312, at 14.2 to 14.8 & 14.2 to 14.9. However, it is notable that the wetlands were already in a highly degraded state. While some of this degradation was due to groundwater withdrawals, other factors such as draining, mining, and invasion by melaleuca had also caused adverse impacts. One interpretation of this decision as a whole is that SFWMD determined that it would not be fair to hold the county responsible for existing adverse impacts in the area. As is discussed in Part IV(B)(3), *infra*, the districts should be allowed to consider equitable concerns in making permitting decisions.

320. SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BASIS OF REVIEW FOR WATER PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT (2003), at http://www.sfwmd.gov/org/reg/rules/wu_bor_092003.pdf.

321. *Id.* at 73.

322. Author's Note: The proposed language of Section 3.3.7 of the Basis of Review was modified after this note was submitted for publication. More recent proposed language of Section 3.3.7 states in relevant part:

[T]he determination of whether elimination or reduction, and mitigation, will be required for impacts to wetlands or other surface waters not identified or expressly authorized to be impacted by the previous consumptive use permit, shall be made considering the following:

- A. The existing wetland and surface water functions;
- B. The degree to which the wetland or other surface water functions are reasonably expected to recover if the withdrawal is reduced or eliminated;
- C. The projected impacts on the existing functions of the wetlands or other surface waters from continuing the water use;

Id. at 74.

SFWMD's changes have ameliorated many of the concerns about Section 3.3.7 discussed in this section of the note. Nevertheless, discussion of the previously proposed language has been retained in this note because it helps illustrate the importance of an adaptive approach to water use decisions.

323. *Id.* at 74. Additional considerations include whether the wetland or surface water is connected to an Outstanding Florida Water, Aquatic Preserve, state park, or other publicly owned conservation land, and whether the wetland or surface water is used by listed species. *Id.* at 75.

which are readily restorable. For example, a wetland that is dry as a result of excessive withdrawals may no longer offer habitat or water purification functions. However, reducing withdrawals would most likely reestablish normal hydroperiods and allow these vital functions to return. Much like Judge Quattlebaum's rationale, such a rule could limit the ability of a district to reevaluate past allocation decisions in light of new scientific understanding of natural systems.³²⁴ This strictly prospective focus has been analogized to the functioning of a "ratchet."³²⁵ Thus, as is discussed, such a focus is inconsistent with the principles of adaptive management.

SFWMD's recent decision regarding the variance for Miami-Dade County and its proposed rules should be compared to the opinion of the Second District Court of Appeals in *Southwest Florida Water Management District v. Charlotte County*.³²⁶ As is discussed *supra*, SFWMD adopted fourteen criteria in its rule implementing the three-part statutory test for issuance of a permit. The Second District Court of Appeals rejected an ALJ's ruling that the fourteen factors must always be balanced.³²⁷ It also interpreted the use of mitigation in this context, upholding rules providing for "measures . . . to prevent, lessen, or rectify . . . an adverse impact to each of the fourteen criteria."³²⁸ Due to the importance of addressing cumulative impacts, which "unavoidably involves site-specific considerations,"³²⁹ the court upheld the development of mitigation measures through "a site-specific, scientific determination allowing for the use of professional judgment."³³⁰ SFWMD suggests the importance in allowing water management districts to make policy judgments regarding water use decisions. It also supports the

324. See *infra* III(C) (2).

325. Richard Hamann, personal communication, February 25, 2002. Hamann's analogy holds true for both Judge Quattlebaum's recommended order in the four-wellfield case and SFWMD's proposed rule. A ratchet usually functions "to prevent reversal of motion." See Random House Dictionary 727 (2d. ed. 1980). Similarly, Judge Quattlebaum's rationale and the proposed rule prevent changes to past allocation decisions. As is discussed, the ability for policy to be adjusted in light of new scientific understanding is a fundamental of adaptive management.

326. 774 So. 2d 903 (Fla. 2d DCA 2001); *Consumptive Use*, *supra* note 312, at 14.2 to 14.9.

327. *Charlotte County*, 774 So. 2d at 910-11. The ALJ found that a balancing approach is required and that failure to satisfy a single criteria does not necessarily preclude issuance of a permit. The Second DCA disagreed and held: "[W]e reverse the ALJ's ruling that that portion of rule 40D-2.301(1) requiring a WUP [water use permit] applicant to satisfy each subsection of the rule is invalid." *Id.*

328. *Consumptive Use*, *supra* note 312, at 14.2 to 14.9 (citing *Charlotte County*, 774 So. 2d at 912).

329. *Charlotte County*, 774 So. 2d at 912.

330. *Consumptive Use*, *supra* note 312, at 14.2 to 14.9 (citing *Charlotte County*, 774 So. 2d at 912).

legitimacy of districts requiring applicants to address adverse environmental impacts. In addition, it is consistent with the drafters' emphasis on the role of expertise in water resource decision-making. While this expertise is useful, further articulation of the considerations that influence such "professional judgment" may advance the goals of certainty, uniformity, and fairness.

C. Certainty, Flexibility, and Fairness

1. Certainty and Uncertainty in Water Law and Policy

The dispute in the northern Tampa Bay area reflects the tension between the goals of certainty and flexibility in water law. Understanding the nature of certainty in water law and management helps illustrate this tension. According to the drafters of the Model Water Code, there are three aspects of certainty in water rights: 1) legal certainty; 2) tenure certainty; and 3) physical certainty.³³¹ However, a fourth aspect of certainty not explicitly identified by the drafters — scientific and technological certainty — has important implications for addressing water disputes.

Legal certainty, which is one of the most important aspects of real property law, "is concerned with protection against the unlawful acts of others."³³² "Tenure certainty involves the protection of water rights against the lawful acts of others, as opposed to unlawful acts in the case of legal certainty."³³³ Physical certainty is an aspect of water rights that is often threatened by changing weather, drought, and other environmental uncertainties.³³⁴ Scientific and technological certainty reflects the level of understanding of natural systems necessary to make management decision and the technological means available to implement them.

A lack of scientific certainty can make it more difficult to recognize and address adverse environmental impacts associated with consumptive use. One example of this situation is the complex relationship between groundwater withdrawals and their affects on overlying lakes and wetlands. Such affects tend to be indirect and

331. MODEL WATER CODE, *supra* note 3, at 158.

332. *Id.* The holder of rights under the doctrine of prior appropriation generally has more legal certainty than a riparian owner. *Id.* The water user in a state that subscribes to the prior appropriations system may rely on a water master to determine priorities of use, while a user in a riparian state must seek a court action, the outcome of which is often uncertain. *Id.*

333. *Id.*

334. *See id.* Under the prior appropriation system, the physical uncertainty is greatly reduced for senior appropriators, but similarly increased for junior appropriators who may have their supply completely cut off. *Id.*

delayed,³³⁵ and in some cases they may be irreversible before they have been detected.³³⁶ Also, the geographic extent of the impacts is hard to predict since it depends on geology that is inconsistent and difficult to ascertain.³³⁷ Furthermore, historical alteration of drainage patterns and cyclical droughts can also confuse causation.³³⁸ As in the four-wellfields case, modeling issues can delay the recognition of the relationship between withdrawals and impacts.³³⁹

A lack of technological certainty can also complicate water management decisions. For example, some individuals have expressed strong opposition to the use of aquifer storage and recovery technology in Florida out of concern for unforeseen effects on aquifer structure and quality.³⁴⁰ On the other hand, new technology can facilitate the implementation of effective water management strategies. Significant technological advances in reverse-osmosis technology have greatly lowered the costs of water desalination. Due to these improvements, and increasing demand for water in the area, Tampa Bay Water has begun using the largest desalination facility in North America.³⁴¹

These are but a few of many examples of the complex role of scientific and technological certainty in water law and policy. This aspect of certainty also bears on the other aspects of certainty of water rights. For example, problems with scientific modeling or technology may negatively affect physical certainty and the ability to satisfy users' needs. Thus, it is necessary to incorporate consideration of certainty factors, especially scientific and

335. Hamann & Ankersen, *supra* note 89, at 41. Diminished hydroperiod may increase fire frequency and intensity, and it may also adversely affect the distribution of species at higher trophic levels. *Id.*

336. *Id.*

337. *Id.*

338. *Id.*

339. *See* In the Public Interest, *supra* note 6, at 147-48.

340. Debbie Salamone, *Science on Trial: An Expert Says Storing Rainwater Underground Could Solve Shortages, but a Foe Warns of Risk*, ORLANDO SENTINEL, Sept. 22, 2002, at A1.

341. On Monday March 18, 2003, the plant began producing 4.9 mgd of drinking water, but at full capacity the plant will provide 25 mgd, or approximately ten percent of the region's drinking water supply. *See* Tampa Bay Water, *Tampa Bay Seawater Desalination Plant Providing Drinking Water to the Region*, at http://www.tampabaywater.org/WEB/Htm/News/news_28March2003_SeawaterDesal.htm. At this output, the plant will be the largest reverse osmosis seawater desalination facility in North America. *Id.* Tampa Bay Water maintains that "[n]umerous independent environmental studies predict the facility will not increase Tampa Bay's salinity beyond its normal seasonal variation or have any impact on the bay's marine life." However, this decision has not been without its critics. Concerns over the potential environmental harm associated disposal of the by-product of desalination, sometimes referred to as "brine" led to an administrative challenge. *See generally* Save Our Bays, Air, and Canals v. Tampa Bay Desal 2001 WL 1917270, DEP 01-0996, Final Order, November 2001 (issuing a permit for the construction of the desalination plant).

technological factors, when attempting to address adverse environmental impacts that are not entirely understood through water management decisions. As discussed, explicitly recognizing and accommodating uncertainty is an important aspect of an adaptive management approach to water policy.³⁴²

2. *Flexibility, Permit Duration, and Permit Renewal*

The four-wellfields dispute illustrates the various considerations that can influence the decision whether to renew a permit and the duration of such permit. Analysis of the Florida Water Resources Act and the writings of the drafters of the Model Water Code illustrate that it is necessary for water management decisions to provide flexibility in order to account for unforeseen consequences, such as in the case of the four-wellfields area.

A fundamental principle of Florida water law is that, unlike in the prior appropriations system, water allocation decisions are periodically reevaluated.³⁴³ While emphasizing the need for this aspect of Florida water law, the drafters of the Model Water Code spoke out against the idea of adopting a prior appropriations system in eastern states such as Florida:

It would be most unfortunate for eastern legislatures to adopt a rule which would tend to freeze water rights through the creation of vested rights in the first user The recognition of such vested rights in the first user has been said to "seriously impede a high level of beneficial use of a state's water resources," and to be a "serious legal barrier to wise water development."³⁴⁴

The drafters explained in the commentary accompanying the Model Water Code that adoption of the prior appropriations approach "does not lead to conservation of water resources"³⁴⁵ nor the "interest-of-the-public principle which should be applied to this great natural resource," but rather, it supports "rugged individualist theory."³⁴⁶

Commentary in the Model Water Code indicates that the drafters specifically contemplated the duration of permits for water use during the drafting process, and they concluded that the "easiest

342. See discussion in Part IV(C), *infra*.

343. See FLA. STAT. § 373.239(3) (2002) (stating that all permit renewal applications shall be treated in the same manner as the initial permit application).

344. MODEL WATER CODE, *supra* note 3, at 79.

345. *Id.* at 80.

346. See *id.*

way to maintain flexibility is to keep the term of permits short.”³⁴⁷ However, the drafters also recognized the need for permit terms to be long enough “to allow water users to recover their investments made in water resource works.”³⁴⁸ They explain that twenty years was selected as the:

maximum permit length in the belief that it would be long enough to provide reasonable security to water users and allow sufficient time to at least partially amortize capital investment, while at the same time providing for some degree of flexibility in the administration of the permit system.³⁴⁹

Furthermore, they note that “[a]lthough the normal permit period is twenty years, the governing board is authorized to grant permits for a lesser time on the basis of source of supply and type of use.”³⁵⁰

Again, reference to the common law factors associated with the “reasonable” and “beneficial use” standards provides a point of reference for balancing flexibility and certainty in water law decisions.³⁵¹ The “protection of existing values” factor “is pertinent both when a permit is sought for an existing use and when application is made for permit renewal.”³⁵² This factor includes the protection of the values established by the granting of a permit.³⁵³ The drafters of the Model Water Code note that “no rigid guidelines should be approved for this factor.”³⁵⁴ Rather, a more experimental approach, such as that associated with an adaptive management approach, should be used.

Three of the common law factors, the “extent and amount of harm caused to others, practicality of avoiding harm, and practicality of adjusting quantity factors, do not apply to issuance of the initial permits if water supplies are adequate.”³⁵⁵ However,

347. *Id.* at 173. The drafters’ commentary noted that there are three approaches available to avoid the undesirable effects of inflexibility in the transfer of water rights while retaining adequate certainty: 1) establish a permit of short duration, 2) grant a long-term permit but also impose a preference system, and 3) grant a perpetual permit and allow free alienability of water rights. *Id.* The drafters of the Model Water Code, after careful study, chose the first alternative. *Id.* at 175.

348. *Id.*

349. *Id.* at 189.

350. *Id.* at 189. Some individuals have criticized the fact that shorter permit durations do not allow for economically viable returns on investments.

351. See Part IV (A), *infra*.

352. *Florida’s Reasonable Beneficial Water Use Standard*, *supra* note 18, at 281. See also FLA. STAT. §§ 373.226-239 (2002).

353. *Florida’s Reasonable Beneficial Water Use Standard*, *supra* note 18, at 281.

354. *Id.*

355. *Id.* at 280.

when water supplies are low or unavailable, as in the case of the Tampa Bay area, these factors should be considered with regard to both initial and renewal applications.³⁵⁶ Such considerations contribute to a more comprehensive and equitable analysis.³⁵⁷

Perhaps the most controversial of the common law factors that affects decision-making under Florida water law is "economic value." One pair of authors notes that commentary of the drafters with regard to economic value is confusing.³⁵⁸ These authors note that terms such as "economic and efficient utilization" and "efficient economic use of water" in the commentary have no particular meaning in and of themselves in economics. However, in completing their analysis, the authors recognized that the legislature intended to employ the term "reasonable beneficial" in a technical sense that is pregnant with common law factors.³⁵⁹ Thus, these authors concluded that it was the intent of the Code and the Act to go "beyond just cost effectiveness" and to also include the "mutual gain/maximizing social benefit characteristics of riparian reasonable use doctrine."³⁶⁰

The authors' conclusions from their economic analysis suggest a three-part goal for economic efficiency under the Act: "(1) insure long-term integrity of the hydrologic system and related ecosystems . . . ; (2) induce water users not to waste water by using cost-effective technology . . . ; and (3) insure that unproductive, low valued uses are discouraged in favor of higher valued, more productive uses."³⁶¹ With regard to this third part, the authors explain that "low value" and 'high value' uses are not limited to dollar representations of water's value, "but neither are monetized versions of value excluded."³⁶² Thus, consideration of common law factors and economic analysis is necessary when evaluating permit duration and the needs of certainty and flexibility. However, fairness concerns of fairness also play an important role in such a determination, and thus warrant further discussion.

356. *Id.*

357. See discussion in Part IVB (3), *infra*.

358. See generally Phyllis P. Saarinen & Gary D. Lynne, *Getting the Most Valuable Water Supply Pie: Economic Efficiency in Florida's Reasonable-Beneficial Use Standard*, 8 J. LAND USE & ENVT'L L. 491, 508 (1993).

359. See *id.* at 508 n.111.

360. *Id.* at 508.

361. *Id.* at 511.

362. *Id.*

3. *Fairness Concerns*

There is a strong argument that the ALJ's conclusions in the four-wellfield case about the extent of permittee responsibility for adverse environmental impacts are inconsistent with fundamental principles of Florida water law. However, the ALJ's emphasis on equitable concerns indicates that it is necessary to reexamine aspects of fairness under Florida water law with regard to addressing environmental impacts.

The decision of the ALJ to renew water permits, rather than deny permits, relies heavily on the fact that there were significant economic investments in the wellfields. The ALJ found that developing and implementing alternative sources to replace the wellfields would cost approximately \$180 million. Although the Draft Final Order expresses concerns about the accuracy of these estimates,³⁶³ there is little question that the four-wellfields represent significant economic investment and reliance. In addition, when permits are renewed, users are often forced to implement more efficient methods for using water or to use alternative sources that are more expensive or less desirable.³⁶⁴ While the environmental protection goals that motivate such requirements are important, these additional requirements can impose hardships on permittees.

Although maintaining hydrological integrity is an important goal of Florida water law, so is providing certainty for water users. The four-wellfields dispute illustrates that there are economic and equitable considerations that are not articulated in permit evaluations. For example, existing economic investment and infrastructure most likely play a major role in permitting decisions, especially in public water supply contexts. Even the drafters of the Model Water Code noted in their commentary: "[t]he renewal applicant would have a strong equitable position unless changed conditions have intervened. In that event, the governing board would be completely free to allocate available water in a manner that is best suited to these new conditions."³⁶⁵ Explicitly recognizing equitable and economic considerations in rule criteria could contribute to a more equitable, uniform, and, transparent permitting process.

In the four-wellfields case, SWFWMD's scientific understanding of the hydrogeology of the area and the relationship between

363. See Draft Final Order, *supra* note 7, at 29. Such predictions reflect the lack of scientific and technological certainty in this dispute.

364. See *Law and Policy in Managing Water Resources*, *supra* note 1, at 308.

365. MODEL WATER CODE, *supra* note 3, at 191.

groundwater withdraws and overlying water systems changed greatly as more data became available. This in turn led to significant changes in its policy stance on adverse impacts occurring in the four-wellfields area.³⁶⁶ While changes in understanding may require SWFWMD to adjust its policies, it may also require adjustment to accommodate the equitable needs of permittees.

The drafters of the Model Water Code carefully considered the issue of whether individuals whose permits are not renewed should be compensated, concluding that they should not.³⁶⁷ This decision has received increased criticism in recent years.³⁶⁸ It is notable that the drafters' rationale behind this decision failed to anticipate the magnitude of a conflict such as the four-wellfields dispute. In addition, the drafters' rationale focused on potential due process concerns associated with replacing the traditional riparian system with an administrative system. Thus, it may be useful for the districts or the legislature to reevaluate the possibility of some form of compensation or other economic or regulatory incentive.

As Florida's population and water demand grows, there will be increasing concerns about fairness. An important area of concern is the expense associated with water supply development. One author asks:

366. See generally *In the Public Interest*, *supra* note 6. In the mid-1980s District scientists became increasingly convinced that too much water was being taken from the system. *Id.* at 84. Honey Rand notes that "[t]he District scientists didn't yet have the proof they needed to stand up in court, but they had a feeling, an uneasy feeling, that something was terribly wrong — and no one wanted to hear about it." *Id.* As more information became available to SWFWMD, a new policy position evolved. Although some activists felt that this change in position with regard to surface water levels was too slow in coming, Pete Hubbell, former SWFWMD Executive Director, noted in an interview: "Look, you don't change an agency on a dime." See *id.* at 163.

367. See MODEL WATER CODE, *supra* note 3, at 177. The drafters of the Model Water Code examined the nature of the property rights of water rights in the east. Specifically, their analysis examined whether the establishing a water permit system, and thus altering or terminating existing water rights, would violate due process. They concluded that such alteration is constitutional under the general welfare aspects of the police power. See *id.* at 163-64.

368. For example, in their economic analysis of the Florida Water Resources Act, Saarinen and Lynne explain:

[E]conomic efficiency, achieved through a process of mutual gain or win/win results, cannot exist in an allocation process based on relatively short duration permits, or those less than the life of the investment, with no compensation for nonrenewal of a permit. The Code commentary describes a maximum twenty-year permit as being long enough to "at least partially" amortize capital investment, ... with apparently no concern for the injustice of allowing a business only partially to recover investment and without any additional discussion of the type of facility considered by such a comment.

Saarinen & Lynne, *supra* note 358, at 518. Some of these fairness concerns are further discussed in part IV(C)(3), *infra*.

Should all users be required to pay the cost of new facilities or just those who immediately need them? Should less expensive sources be reserved for certain users, such as agriculture, that may not be able to pay higher costs? . . . Is it appropriate to place the burden of paying for new water supply sources on those who pay *ad valorem* or sales taxes, rather than the rate payers who will use the water produced? What about those who pay nothing for water, for example, self-supplied residential or agricultural users? Should a fee be assessed on those users to pay for alternative water supplies and the protection of existing water supplies?³⁶⁹

That author further notes, “[i]ncreasingly, such inequities are being resolved by asking the water management districts and state government to finance the construction of water supply facilities.”³⁷⁰ Other areas of fairness concerns have to do with the right to growth. Currently, rural areas provide water to developed areas. The ability of these rural areas to develop may be significantly limited by past water allocation decisions. This can lead to the unfair result of one area prospering at the expense of another.³⁷¹

In the resolution of the four-wellfields dispute, fairness concerns played an important role in settlement. SWFWMD cooperated significantly in terms of permitting flexibility and providing economic aid to projects associated with improving the Tampa Bay area’s water supply system.³⁷² This type of cooperation between permittees and the Districts is especially important when making policy adjustments to accommodate new science or technology. Further incorporation of an adaptive management approach into Florida’s water management system may encourage such cooperation and help reach a more effective balance between certainty, flexibility, and fairness under Florida water law.

D. The Need to Incorporate Adaptive Management into Water Law and Policy

1. Adaptive Management and Water Resource Decision-making

The term “adaptive management” has come to embody a number of related meanings that can be useful for water management

369. *Law and Policy in Managing Water Resources*, *supra* note 1, at 308.

370. *Id.*

371. *Id.* at 308-09. *See also* In the Public Interest, *supra* note 6, at 395.

372. *See* Part III (E), *infra*.

decision-making. One author explains that “[a]daptive management assumes that scientific knowledge is provisional and focuses on management as a learning process or continuous experiment where incorporating the results of previous actions allows managers to remain flexible.”³⁷³ The notion of using “the best science available” reflects the fact that scientists and resource managers must engage in some level of reasoned guesswork to make decisions.³⁷⁴ Adaptive management also refers to a comprehensive approach to decision-making that recognizes the limits of scientific certainty and attempts to incorporate different perspectives.³⁷⁵

Adaptive management can be a useful decision-making approach for natural resource management agencies.³⁷⁶ While adaptive management may initially seem more expensive than some traditional decision-making approaches, it may prove less expensive in the long-run if it leads to more effective management.³⁷⁷ Due to

373. R. Edward Grumbine, *What Is Ecosystem Management?*, 8 CONSERVATION BIOLOGY 27, 31 (1994).

374. Thomas T. Ankersen & Richard Hamann, *Ecosystem Management and the Everglades: A Legal and Institutional Analysis*, 11 J. LAND USE & ENVT'L. L. 473, 493 (1996). The authors explain:

When confronted by uncertainty in the course of a scientific investigation, the systematic response of a scientist is suspension of judgment pending the acquisition of more data and the development of testable hypotheses. In science, “no decision” can mean just that. In legal disputes, however, “no decision” perpetuates the status quo and ordinarily promotes some interests at the expense of others. Lacking a comparable option to suspend the flow of events, legal decisionmakers must often create public policy in spite of, or in light of, the absence of reasonable scientific consensus.

Id. (citing Howard A. Latin, *The “Significance” of Toxic Health Risks: An Essay on Legal Decisionmaking Under Uncertainty*, 10 ECOLOGY L. Q. 339, 339 (1982)).

375. One author explains:

Adaptive management tries to incorporate the views and knowledge of all interested parties. It accepts the fact that management must proceed even if we do not have all the information we would like, or we are not sure what all the effects of management might be. It views management not only as a way to achieve objectives, but also as a process for probing to learn more about the resource or system being managed. Thus, learning is an inherent objective of adaptive management. As we learn more, we can adapt our policies to improve management success and to be more responsive to future conditions.

Johnson, *supra* note 191.

376. *Id.* An important dimension of this operational approach is consensus building, a process that begins by bringing affected parties together. *Id.* These parties should then discuss the management problem, the available data, and attempt to conceptualize how the system in question operates. *Id.* Next, these parties should develop a management plan to attempt to reduce critical data gaps and uncertainties. *Id.* The management plan is then implemented along with a monitoring plan, and as monitoring proceeds, new data are analyzed and management plans are revised as the understanding of how the system works improves. *Id.*

377. *Id.*

the indirect and delayed nature of impacts resulting from groundwater withdrawals and associated political and economic concerns, an adaptive management approach may be well-suited to complex disputes such as the one that arose in the four-wellfields case.³⁷⁸ While such a comprehensive approach may not be necessary in all permitting or water management decisions, it can be especially useful in complex disputes involving adverse environmental impacts and strong public need. Through cooperation, adaptive management attempts to understand the potential trade-offs among stakeholder interests and tries to generate innovative approaches and “win-win” situations.³⁷⁹ This cooperation will become increasingly important because recent amendments to the Florida Water Resources Act require increasing available water for both human and natural systems.³⁸⁰

Judge Quattlebaum’s Recommended Order in the four-wellfields case is problematic because it is inconsistent with the experimental approach underlying adaptive management. He recommended that SWFWMD issue permits, despite the occurrence of severe adverse environmental impacts. As the Draft Final Order suggests, such a rationale relies heavily on past decisions of SWFWMD. Although SWFWMD had changed its policy position, this change was due to new scientific understanding of the hydrogeology of the four-wellfields area. Water management policy should be allowed to respond to improved scientific understanding. The ALJ’s rationale overlooks the important process of reevaluating previous water allocation decisions inherent in the Florida Water Resources Act. Further adoption of the rationale of the ALJ, and that of SFWMMD’s proposed consumptive use renewal rule, both of which imply that the right to cause adverse environmental impacts can somehow “vest,” could significantly limit the ability of water management districts to engage in hydrologically sound decision-making.

The history of the permitting process for the four-wellfields area demonstrates the importance of incorporating adaptive management into permitting decisions. Arguably, the original permits and the first renewal permits for the four-wellfields did not embody an experimental approach consistent with the principles of

378. In reference to large, complex systems, one author explains: “These types of problems are ecologically complex because many different components interact directly and indirectly, and socially complex because multiple user-groups often have conflicting goals that involve multiple components of the system.” *Id.*

379. *Id.*

380. See Fla. Stat. § 373.0831(2)(a) (2002) (stating that it is the intent of the legislature that “[s]ufficient water be available for all . . . reasonable-beneficial uses and the natural systems”).

adaptive management.³⁸¹ Under such an approach, SWFWMD would have required more extensive monitoring and would have explicitly conditioned permitted withdrawals on surface environmental circumstances. It was not until the second permit renewal applications, when severe environmental impacts had already taken place, that SWFWMD explicitly articulated "Environmental Protection Standards."³⁸²

Ideally, the permitting process should function much like an experiment. Permitting quantities should be based on the best available models of the area. Permittees and the districts should cooperate in monitoring the aquifer and surrounding natural systems. If subsequent field data is inconsistent with existing models, the models and permitted withdrawal amounts should be adjusted accordingly. In implementing such permitting changes, regulatory flexibility or financial assistance on the part of the districts can help ensure fairness to the permittee. This type of experimental and cooperative process is closer to the approach currently being implemented through the joint efforts of SWFWMD and Tampa Bay Water.

In addition, the experimental approach of adaptive management is now more integrated within SWFWMD's Basis of Review than it was at the time of the four-wellfields dispute. The "Conditions for Issuance" section of the Basis of Review explains that SWFWMD staff will evaluate environmental features including surface water bodies and wetlands³⁸³ and articulates "performance standards."³⁸⁴ Furthermore, the "Monitoring Requirements" section explicitly articulates the relationship between permitted withdrawals and adverse environmental impacts and requires monitoring.³⁸⁵ Standard permit conditions explicitly emphasize the importance of

381. Indeed, this issue is fundamental to the dispute in the Recommended Order. The Authority argued that SWFWMD knew that the impacts would occur and granted permits anyway. In contrast, SWFWMD emphasized the conditional nature of permits and argued that it was unaware of the extent of adverse environmental impacts that would result from the permitted withdrawals.

382. See Part III (B), *infra*.

383. BASIS OF REVIEW, *supra* note 102, at B4.1-B4.5.

384. For example, the Basis of Review states, "[w]etland hydroperiod shall not deviate from their normal range and duration to the extent that wetlands plant species composition and community zonation are adversely impacted." *Id.* at B4.3.

385. *Id.* at B5-1. The introduction to this section of the Basis of Review states: Issuance of a Water Use Permit requires that (1) the withdrawals will not cause any unmitigated adverse impacts on the water resources and the existing legal users, and (2) the use continues to be in the public interest. To ensure that these criteria continue to be met after the permit is issued, monitoring and reporting activities may be required as conditions of the permit.

Id.

mitigation.³⁸⁶ An additional “Environmental Monitoring” condition can be used “when extensive environmental monitoring is required, such as when withdrawals potentially impact wetlands.”³⁸⁷ In addition, there are “Public Supply Permit Conditions” that may require a “Water Use Interim Report.”³⁸⁸

As a whole, the four-wellfields dispute demonstrates that incorporating principles of adaptive management into the water management process can help address unforeseen circumstances and scientific uncertainty. SWFWMD has been able to improve its regulatory system and develop more effective working relationships with Tampa Bay Water in order to better balance the needs for public water supply and natural systems. This dispute also illustrates that water law and policy must be allowed to evolve along with science and technology.

2. *The Importance of an Evolutionary Approach to Water Law and Policy*

In order to adequately address the conflicts that will continue to arise between public water supply needs and adverse environmental impacts, water law must evolve at statutory and administrative levels. Since the drafting of the Model Water Code and the passage of the Florida Water Resources Act, the DEP and water management districts have fleshed out the basic statutory framework to fit the needs of the state.³⁸⁹ As one drafter of the Model Water Code notes in a later article: “[t]he result of this process is a water management program that has adapted, and will continue to adapt, to changes in the physical environment as well as to changes in popular attitudes about economic development and the environment.”³⁹⁰

The drafters of the Model Water Code emphasized the importance of establishing management entities that possess expertise to make water management decisions, as opposed to judges or legislators with little specialized knowledge or

386. See, e.g., *id.* at B6-2, Condition No. 13. This section states: “The Permittee shall mitigate to the satisfaction of the [Southwest Florida Water Management] District any adverse impact to environmental features or off-site land uses as a result of withdrawals. When adverse impacts occur or are imminent, the [Southwest Florida Water Management] District shall require the Permittee to mitigate the impacts.” *Id.* Example of adverse impacts include “[s]ignificant reduction in levels of flows in water bodies such as lakes, impoundments, wetlands, springs, streams, or other watercourses.” *Id.*

387. *Id.* at B6-14, Condition No. 21.

388. See *id.* at B6-24. The Water Use Interim Report attempts to verify projections of demand versus actual demands. *Id.*

389. See Ausness, *supra* note 27, at 29.

390. *Id.*

experience.³⁹¹ The Florida Supreme Court has noted that "the very conditions which may operate to make direct legislative control impractical or ineffective may also, for the same reasons, make the drafting of detailed or specified legislation impractical or undesirable."³⁹² The Florida legislature recognized the need for flexibility in the application of the Water Resources Act, and thus directed relevant agencies to weigh the common law factors of reasonable beneficial use.³⁹³ One drafter explains in a later article: "By providing for the refinement of policy by rule-making, the legislature authorized [these agencies] to flesh out Florida's declaration of water resources policy by administrative action."³⁹⁴

Water policy in Florida must continue to evolve in terms of both planning and regulation. One drafter explains in a later article that it would be desirable for relevant regulatory entities to "act together as partners, rather than compete for exclusive control over water management decision-making,"³⁹⁵ and that "this was the approach to water management envisioned by the drafter of the Model Water Code."³⁹⁶ Tampa Bay's water wars further demonstrate the importance of cooperation between water management districts and water supply entities.³⁹⁷

Due to the distinct characteristics of Florida's many lakes and watercourses, each permit decision presents different combinations of factors to be weighed.³⁹⁸ It is necessary to confront the difficult question posed by the drafters of the Model Water Code: "[W]hat is the best use?"³⁹⁹ They emphasized the importance of an interdisciplinary approach to addressing this question, and explained that there is a need for "[a] working team of hydrologists, biologists, engineers, economists, political scientists and lawyers

391. See *Florida's Reasonable Beneficial Water Use Standard*, *supra* note 18, at 277. "[I]t is impractical for the legislature to enact specific standards for the exercise of administrative discretion." *Id.*

392. *Id.* at 277.

393. *Id.*

394. *Id.* at 278.

395. See Ausness, *supra* note 27, at 30 (referring to the need for the Department of Environmental Regulation [predecessor of the Department of Environmental Protection] and water management districts to cooperate).

396. *Id.*

397. Recent legislative changes reflect this need for cooperation. See e.g. FLA. STAT. § 373.196(1) (2002) (stating that the legislature finds "that cooperative efforts between municipalities, counties, water management districts, and the Department of Environmental Protection are mandatory in order to meet the water needs of rapidly urbanizing areas in a manner which will supply adequate and dependable supplies of water where needed without resulting in adverse effects upon the areas from whence such water is withdrawn.")

398. See *Florida's Reasonable Beneficial Water Use Standard*, *supra* note 18, at 277.

399. MODEL WATER CODE, *supra* note 3, at 80.

. . . .⁴⁰⁰ Determination of whether, under all the facts and circumstances, a proposed use in a particular location meets the three-pronged test requires expertise and experience. This expertise will continue to evolve and improve along with scientific and technological understandings of the relationships between human activities and the hydrologic cycle. Further incorporating principles of adaptive management into Florida's water management system will help achieve the difficult balances necessary under Florida water law.

V. CONCLUSION

Water is becoming increasingly scarce, and future conflicts over how to use and manage this precious resource are certain to arise.⁴⁰¹ As increasing numbers of existing consumptive use permits become due for renewal, it will be necessary for the water management districts to reevaluate their past permitting decisions. They must continue to seek a delicate balance between the water needs of human and natural systems. In many cases it will also be necessary for the districts to evaluate adverse environmental impacts that have resulted from permitting decisions made as many as twenty, or in some cases, fifty years ago.

Florida water law, the Model Water Code, and the writings of its drafters indicate that it is necessary to require permittees to address adverse environmental impacts that result from consumptive use. Ameliorating existing adverse impacts and preventing future impacts is an important part of maintaining overall hydrological integrity. This hydrological integrity is essential for ensuring both the quantity and quality of water necessary for human and ecosystem needs. In order to fulfill this goal, administrative agencies such as DEP and the water management districts must be allowed to reevaluate past decisions and, if necessary, readjust them. New environmental conditions, or even changed understandings of hydrologic systems, may require changes in water allocation. This concept of flexibility is a fundamental principle of Florida water law and an important characteristic of an adaptive management approach to water policy.

However, it is also necessary for these agencies to consider the effects that policy changes can have on permittees who have come to rely on past decisions. Equitable concerns may warrant some type of regulatory flexibility, compensation, or other economic incentive. The Tampa Bay water wars ultimately illustrate that

400. *Id.*

401. See *Law and Policy in Managing Water Resources*, *supra* note 1, at 308.

communication and cooperation among regulatory agencies and permittees is necessary in order to achieve workable water management decisions. Further incorporation of principles of adaptive management into Florida's water management system will help ensure that the state's most precious natural resource is used in ways that are reasonable, beneficial, and consistent with the public interest.