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COMMENTS

DID WE MISS THE BOAT? THE CLEAN WATER ACT AND SUSTAINABILITY

INTRODUCTION

In 1974, water management captured the nation's imagination on the silver screen in a film called *Chinatown*.[1] The film was written by Robert Towne, who later explained that his inspiration for the script came from a Los Angeles vice officer who told him that the vast array of dialects and gangs operating in Chinatown made it impossible to know whether police intervention protected victims of crimes or the criminals themselves.[2] Towne said that he wanted to write about an issue "right out in front of everybody . . . as prevalent as water faucets."[3] Based on the Owens River Valley scandal, the film explores the relationship between water management, land development, and political power.[4] The

1. CHINATOWN (Paramount Pictures 1974).

2. *See* MICHAEL EASTON, CHINATOWN 13 (1997).

3. Alex Simon, *Robert Towne: The Hollywood Interview*, THE HOLLYWOOD INTERVIEW, http://thehollywoodinterview.blogspot.com/2009/10/robert-towne-hollywood-interview.html (last visited Apr. 19, 2013).

4. *See id. See generally* JOHN WALTON, WESTERN TIMES AND WATER WARS (1992). The factual premises underlying the film are actually quite complex, but, in short, Frederick Eaton—the mayor of Los Angeles—and William Mulholland—chief of the Bureau of Water Works and Supply—recognized that the Los Angeles River could not fully supply the growing demands of Los Angeles. *See* WALTON *supra*, at 143, 150. Rain fell irregularly and the city's population was growing. *Id.* at 142. Through a series of backroom deals and shady purchases, the pair arranged to construct the Owens River Aqueduct. *See id.* at 143, 150–52. Construction was complete in 1913 and the aqueduct successfully supplied the city with additional water. *See id.* at 152. But the city continued to grow, and, in 1923, Los Angeles began purchasing entire Owens Valley farms as well as water rights to streams flowing into Mono Lake. *See id.* at 156, 165. Ultimately, valley businesses failed as their customers were bought out of their homes and, today, while over three million people live in Los Angeles—only about twenty-seven thousand people live in Inyo and Mono counties. *See id.* at 200–01; *State & County Quick Facts*, U.S. CENSUS BUREAU, http://quickfacts.census.gov/qfd/states/06/06037.html (last revised Mar. 11, 2013).

real-life scandal literally changed the landscape of California and sparked legal disputes that continued well into the 1980s.[5] Today, Owens Lake, once a navigable terminus of the Owens River that sustained a healthy ecosystem, is a semi-dry lakebed.[6] The California State Water Resources Control Board spared Mono Lake—another basin from which Los Angeles diverted water to benefit its populace—the same ignominy: on September 28, 1994, the board issued an order requiring the Los Angeles Department of Water and Power to take specific actions to restore the Mono Basin.[7]

Historically, civilizations have developed in proximity to water and competed fiercely to control it.[8] As the Supreme Court of California stated, "[t]he prosperity and habitability" of human communities depend upon "the diversion of great quantities of water" to facilitate growth.[9] But, as that court also acknowledged, the public trust "is an affirmation of the duty of the state to protect the people's common heritage of streams, lakes, marshlands and tidelands."[10] Certainly, unbalanced, unsustainable development threatens wildlife and ecological quality; but it also impairs human dignity because environmental issues affect our populations unequally.[11]

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5. *See, e.g.*, Nat'l Audubon Soc'y v. Superior Court, 658 P.2d 709, 711–12 (Cal. 1983).

6. *See* Martha Davis, Speech at UCLA Environment Symposium: Stepping Outside the Box (Mar. 3, 1998), *available at* http://www.monolake.org/mlc/outsidebox; Paul Lebowitz, *Owens River Odyssey*, CANOE & KAYAK MAG. (Jan. 10, 2011), http://www.canoekayak.com/travel/western-us/owens-river-odyssey/ ("After a decades-long legal battle, a court ordered the [Los Angeles Department of Water and Power] to leave a small portion of water in the river, and in December 2006—after tiring of paying $5,000 per day in fines—the big city finally relented.").

7. Amendment of the City of Los Angeles's Water Right Licenses for Diversion of Water From Streams Tributary to Mono Lake, Decision 1631, slip op. at 5, 74–76 (Cal. Water Res. Control Bd. Sept. 28, 1994), *available at* http://www.waterboards.ca.gov/publications_forms/publications/general/docs/monolake_wr_dec1631_a.pdf.

8. *See* Peter H. Gleick, *Making Every Drop Count*, 284 SCI. AM. 40, 40 (2001); William K. Stevens, *Water: Pushing the Limits of an Irreplaceable Resource*, 14 NAT. RESOURCES & ENV'T 3, 3–4 (1999).

9. *Nat'l Audubon Soc'y*, 658 P.2d at 712. The "habitability" of growing communities also depends on having somewhere to put trash and sewage. *See, e.g.*, Missouri v. Illinois, 200 U.S. 496, 517 (1906) (hearing a common law suit brought by Missouri to enjoin sewage discharges from Chicago into the Mississippi River, which happened to be the source of Missouri's drinking water).

10. *Nat'l Audubon Soc'y*, 658 P.2d at 724.

11. *See, e.g.*, Diego Martino et al., *Environment for Development*, *in* 4 U.N. ENV'T PROGRAMME, GLOBAL ENV'T OUTLOOK 3, 4–5 (2007) (explaining that environmental, economic, and social issues are "interlinked").

When Congress enacted the Clean Water Act in 1972, it recognized that the quality of our natural environment affects the quality of our human environment.[12] The act declared a national policy for addressing the nation's water crises through three measures of water quality: "The objective of this chapter is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[13] Since then, academics have questioned whether Congress understood the implications of its goals;[14] whether those standards have been accomplished;[15] and whether the Clean Water Act could succeed as an "ecosystem protection" law—a law that encourages healthy ecosystems replete with native wildlife and sustainable human activity.[16] But forty years later, only 28% of the nation's small streams support healthy biological communities, while 30% of the nation's streams are at a high risk of degraded biological communities due to excess nutrients and sedimentation.[17] The National Lake Assess-

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> [N]atural capital accounts for 26 per cent of the wealth of low-income countries. Up to 20 per cent of the total burden of disease in developing countries is associated with environmental risks. Poor women are particularly vulnerable . . . . Acute respiratory infections are the leading cause of death in children . . . . A combination of unsafe water and poor sanitation is the world's second biggest killer of children.

Id. at 5.

12. Clean Water Act § 101(a)(2), 33 U.S.C. § 1251(a)(2) (2006); Clean Water Act § 303(c), 33 U.S.C. § 1313(c) (2006) (requiring state water quality standards to be stringent enough to protect a "designated use[]" and the public health and welfare).

13. Clean Water Act § 101, 33 U.S.C. § 1251 (2006).

14. Robert W. Adler, *The Two Lost Books in the Water Quality Trilogy: The Elusive Objectives of Physical and Biological Integrity*, 33 ENVTL. L. 29, 35–36 (2003).

15. *Id.* at 47–48; *see also* Reed D. Benson, *Pollution Without Solution: Flow Impairment Problems Under Clean Water Act Section 303*, 24 STAN. ENVTL. L.J. 199, 200–01 (2005) ("The CWA does not, however, prevent every activity that adversely affects the chemical, physical, or biological integrity of America's waters.").

16. *See* Holly Doremus & A. Dan Tarlock, *Can the Clean Water Act Succeed As an Ecosystem Protection Law?*, GEO. WASH. J. ENERGY & ENVTL. L. (forthcoming 2013) (manuscript at 2, 7-9), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2168724.

17. ENVTL. PROT. AGENCY, NATIONAL AQUATIC RESOURCE SURVEYS: AN UPDATE 1 (Jan. 2011), *available at* http://water.epa.gov/type/watersheds/monitoring/upload/nars-progress.pdf. Surveys such as the 2006 Wadeable Streams Assessment and National Rivers and Streams Assessment are conducted using modern, probability-based survey techniques to provide unbiased baselines and trends for water body conditions and for key indicators of ecological and human health within water bodies. *See* ENVTL. PROT. AGENCY, NATIONAL RIVERS AND STREAMS ASSESSMENT FACT SHEET 1 (May 2011), *available at* http://water.epa.gov/type/watersheds/monitoring/upload/2011may_nrsa_fact_sheet.pdf; ENVTL. PROT. AGENCY, WADEABLE STREAMS ASSESSMENT: A COLLABORATIVE SURVEY OF THE NATION'S STREAMS ES-4–ES-5 (Dec. 2006), *available at* http://water.epa.gov/type/rsl/monitoring/streamsurvey/upload/2007_5_16_streamsurvey_WSA_Assessment_May2007.pdf.

ment reported that increasing levels of nitrogen, phosphorus, temperature, light, and poor shoreline conditions similarly threaten the United States' lakes and human health.[18] Excess nutrients have promoted the growth of microcystin[19]—an algal toxin associated with liver damage, liver cancer, and death[20]—in approximately one-third of United States lakes.[21]

The United States Environmental Protection Agency ("EPA") primarily attributes ongoing water quality impairments to nonpoint source pollution, which presents regulators distinct technical and political challenges.[22] Nonpoint source pollution is "any source of water pollution that does not meet the legal definition of 'point source'"; therefore, nonpoint source pollution originates from whatever is not a point source.[23] A point source, by comparison is "any discernible, confined and discrete conveyance . . . from which pollutants are or may be discharged."[24] Addressing nonpoint pollution has more to do with changing how we use water, how we use land within watersheds, and how we think about our role within an ecosystem than it has to do with fancy widgets and controlling a single point of discharge.[25] The world's fresh water supply is small and finite, which means it continually must be recycled and reused to support both aquatic ecosystems and our human communities.[26] The two systems are not mutually exclusive—we exist within a single socio-ecological system that de-

18. NATIONAL AQUATIC RESOURCE SURVEYS: AN UPDATE, *supra* note 17, at 1–2. The National Lakes Assessment is another probability-based survey. *See* ENVTL. PROT. AGENCY, NATIONAL LAKES ASSESSMENT FACT SHEET 1 (Apr. 2010), *available at* http://water.epa.gov/type/lakes/upload/nla_survey_fact_sheet.pdf.

19. Ian R. Falconer & Andrew R. Humpage, *Health Risk Assessment of Cyanobacterial (Blue-green Algal) Toxins in Drinking Water*, 2 INT'L J. ENVTL. RES. & PUB. HEALTH 43, 44, 46 (2005).

20. Ian R. Falconer, *Health Effects Associated with Controlled Exposures to Cyanbacterial Toxins*, 619 ADVANCES IN EXPERIMENTAL MEDICINE & BIOLOGY 607, 607, 609 (2008), *available at* http://www.epa.gov/cyano_habs_symposium/monograph/Ch27.pdf.

21. NATIONAL AQUATIC RESOURCE SURVEYS: AN UPDATE, *supra* note 17, at 2.

22. *See* INT'L ASS'N FOR GREAT LAKES RES., LINKING SCIENCE AND POLICY FOR URBAN NONPOINT SOURCE POLLUTION IN THE GREAT LAKES REGION 17 (2002), *available at* http://iaglr.org/scipolicy/nps/index.php; *What is Nonpoint Pollution?*, ENVTL. PROT. AGENCY (Aug. 27, 2012), http:// water.epa.gov/polwaste/nps/whatis.cfm.

23. *What is Nonpoint Pollution?*, *supra* note 22 (defining "point source" according to section 502(4) of the Clean Water Act); *see* Clean Water Act § 502(14), 33 U.S.C. § 1362(14) (2006).

24. Clean Water Act § 502(14).

25. Lawrence J. Jensen, *How People Matter in Nonpoint Cleanup*, 12 EPA J. 3, 4 (1986).

26. *See* Stevens, *supra* note 8, at 3.

pends on balance for sustainability.[27] Achieving sustainable water quality that supports future development will require an approach that considers ecological, economic, and social interests conjunctively, while developing enforceable strategies.[28]

That approach might look something like the Chesapeake Bay Program. The program engages states, agencies, local governments, and organizations in a cooperative effort to restore the Chesapeake Bay,[29] the largest estuary in the United States[30] and home to more than seventeen million people.[31] More importantly, the program conducts research that integrates climate change, wildlife assessments and management, chemical pollution, land uses, and population growth, among other factors, and evaluates their cumulative impact on the Chesapeake Bay.[32] The Chesapeake Bay Program does many things well, but it has one significant limitation. It relies upon its partner jurisdictions to translate the totality of its research into effective programs through their own complicated web of regulatory schemes.[33] As a result, implementation is uneven, and the physical and biological integrity of local waters remain impaired even while their chemical health gradually improves.[34]

This comment argues for more political accountability and more scientific consideration when addressing water quality. It

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27. *See* BRIAN WALKER & DAVID SALT, RESILIENCE THINKING: SUSTAINING ECOSYSTEMS AND PEOPLE IN A CHANGING WORLD 11–12 (2006).

28. *See* A Dan Tarlock & Lora A. Lucero, *Connecting Land, Water, and Growth*, 34 URB. LAW. 971, 971, 976 (2002).

29. *Who We Are*, CHESAPEAKE BAY PROGRAM, http://www.chesapeakebay.net/about/who (last visited Apr. 19, 2013).

30. *Facts & Figures*, CHESAPEAKE BAY PROGRAM, http://www.chesapeakebay.net/discover/bay101/facts (last visited Apr. 19, 2013).

31. *Bay 101*, CHESAPEAKE BAY PROGRAM, http://www.chesapeakebay.net/discover/bay101/ (last visited Apr. 19, 2013). The program's cooperative approach has led to the development of watershed management plans for approximately fourteen million of the thirty-four million watershed acres in Maryland, Pennsylvania, Virginia, and the District of Columbia. *Developing Watershed Management Plans*, CHESAPEAKE BAY PROGRAM, http://www.chesapeakebay.net/indicators/indicator/developing_watershed_management_plans (last visited Apr. 19, 2013).

32. *See* ENVTL. PROT. AGENCY, CHESAPEAKE BAY PHASE 5.3 COMMUNITY WATERSHED MODEL 12-3, 12-37 (2010), *available at* http://www.chesapeakebay.net/modeling/P5Documentation/SECTION_12.pdf; *Modeling*, CHESAPEAKE BAY PROGRAM, http://www.chesapeakebay.net/about/programs/modeling (last visited Apr. 19, 2013).

33. Robert W. Adler & Michele Straulba, *Watersheds and the Integration of U.S. Water Law and Policy: Bridging the Great Divides*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 1, 33 (2000).

34. *See, e.g.*, NATIONAL AQUATIC RESOURCE SURVEYS: AN UPDATE, *supra* note 17, at 2.

begins, in Section I, with an overview of the Clean Water Act, its distinction between point and nonpoint sources, and the connection between nonpoint source pollution, water use, and land use. Section II considers the tension between beneficial uses and environmental degradation by taking a look at a dramatic example of hydrologic modification.[35] Section III considers an effluent dominated waterbody—the Los Angeles River—and the difficulties that regulating point sources to the river presents. Finally, Section IV suggests a different approach—one that is modeled after the Chesapeake Bay Program (with a twist).

I. THE CLEAN WATER ACT

Congress created the Clean Water Act to hit water pollution like a two-punch, cooperative federalism combo.[36] Through section 301, Congress made unlawful the discharge of any pollutant, and required the EPA to develop effluent limitations for point sources, which require dischargers to apply pollutant control technology.[37] Through section 303, which provides the framework for the Total Maximum Daily Load ("TMDL") program, Congress required states to publish water quality standards and identify any additional reductions—from both point and nonpoint sources—necessary to support designated uses.[38] For a number of reasons, these programs developed independently of one another, and implementation of the section 303 TMDL program lagged significantly behind the technology-based controls mandated by section 301.[39] However, increased emphasis on the TMDL program has not been enough to restore the biological and physical integrity of our nation's aquatic ecosystems.[40] Examining the relationship be-

35. *See, e.g.*, S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians, 541 U.S. 95, 99–100 (2004). Hydrologic modifications are human activities that alter the natural landscapes, flow, or course of a waterbody. *See* Benson, *supra* note 15, at 201 n.5.

36. *See* William L. Andreen, *Water Quality Today—Has the Clean Water Act Been a Success?*, 55 ALA. L. REV. 537, 592 (2004).

37. Clean Water Act § 301, 33 U.S.C. § 1311 (2006).

38. Clean Water Act § 303, 33 U.S.C. § 1313 (2006).

39. *See* Oliver A. Houck, *TMDLs IV: The Final Frontier*, 29 ENVT'L L. REP. 10,469, 10,473–74 (1999); *see also* Scott v. City of Hammond, 741 F.2d 992, 998 (7th Cir. 1984) ("We believe that more than enough time has passed since Congress prescribed promulgation of TMDL's.").

40. *See, e.g.*, NATIONAL AQUATIC RESOURCE SURVEYS: AN UPDATE, *supra* note 17, at 1–2; Valentina Cabrera-Stagno, *Developing Effective TMDLs: An Evaluation of the TMDL Process*, *in* PROCEEDINGS: WATER ENVIRONMENT FEDERATION TMDL 2007 CONFERENCE, BELLEVUE, WASHINGTON 443, 443–44 (2007).

tween section 301 and section 303, as well as the relationship between "pollutants" and "pollution," may provide some insight as to why.

A. *Controlling "Pollutants" at the "Point Source"*

The Clean Water Act relies foremost on technology-based controls required by its "heart," section 301, and administered primarily through the National Pollutant Discharge Elimination System ("NPDES").[41] However, if technology-based controls are insufficient to attain or maintain a standard of water quality that assures the "protection of public health, public water supplies, agricultural and industrial uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow[s] recreation activities," then the EPA also is authorized to establish more stringent effluent limitations or alternative effluent control strategies pursuant to section 302.[42] Section 302 standards are supplemental—only to be invoked when the section 301 technology-based controls fail to achieve the goals of the Act.[43]

Statutory definitions have a significant impact on the substantive effects of the Clean Water Act's provisions. Section 301(a) generally prohibits the "discharge of any pollutant" unless authorized by a permit requiring compliance with technology-based controls.[44] A "discharge of any pollutant" occurs when there is "any addition of any pollutant to navigable waters from any point source."[45] Therefore, by definition, section 301 only prohibits activities that result in the addition of a "pollutant" to the waters of the United States from any "point source."[46] A "point source" is

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41. ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 649 (2009); *see* Clean Water Act § 301; Clean Water Act § 402, 33 U.S.C. § 1342 (2006).

42. Clean Water Act § 302(a), 33 U.S.C. § 1312(a) (2006).

43. *Id.*; *see also* Karen M. McGaffey, *Water Pollution Control Under the National Pollutant Discharge Elimination System*, *in* THE CLEAN WATER ACT HANDBOOK 9, 33 (Mark A. Ryan ed., 2d ed. 2003).

44. Clean Water Act § 301(a), 33 U.S.C. § 1311(a) (2006); PERCIVAL, *supra* note 41, at 651.

45. Clean Water Act § 502(12), 33 U.S.C. § 1362(12) (2006).

46. *See id.* Debate over what waters constitute and do not constitute "navigable waters," defined as the "waters of the United States," has elicited multiple Supreme Court cases. *See, e.g.*, Rapanos v. United States, 547 U.S. 715, 729 (2006); Solid Waste Agency of N. Cook Cnty. v. U.S. Army Corps of Eng'rs, 531 U.S. 159, 162 (2001); United States v.

any "discernible, confined and discrete conveyance," which may include ditches, pipes, containers, and concentrated animal feeding operations, among other things.[47] Finally, a "pollutant" is "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials . . . and industrial, municipal, and agricultural waste."[48] The consequence of these definitions is a very specific regulatory focus targeting industrial, municipal, and agricultural byproducts and substances discharged by individual sources.[49] If an activity or source is not a point source, then it is a nonpoint source and is not subject to effluent limitations promulgated pursuant to section 301.[50]

The statutory definition of "pollutant" aligns with the conventional understanding of the water quality problem, and there is evidence that Congress intended the Clean Water Act to target chemical pollutants from point sources as an initial measure.[51] Section 301 addressed a highly visible problem, and one that would allow for demonstrable progress—chemical concentrations are measurable and more likely to be traceable to a distinct point source.[52] And once the EPA identifies a point source, it has clear statutory authority to require the operator to slap a control widget onto the offending point source and treat its effluent.[53] Moreover, the point source program has been relatively effective at controlling discharges from point sources.[54]

However, "pollution," as defined by the Clean Water Act, encompasses activities much broader than those directly prohibited by section 301, including contributions from nonpoint sources. "Pollution" refers to "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of wa-

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Riverside Bayview Homes, Inc., 474 U.S. 121, 126 (1985).

47. Clean Water Act § 502(14), 33 U.S.C. § 1362(14) (2006).

48. Clean Water Act § 502(6), 33 U.S.C. § 1362(6) (2006).

49. *See* Clean Water Act § 502(6); *see also* Adler, *supra* note 14, at 32, 61.

50. *See What is Nonpoint Source Pollution?*, *supra* note 22.

51. *See* Adler, *supra* note 14, at 35, 66.

52. *See id.* at 35; Donald J. Kochan, *Runoff and Reality: Externalities, Economics, and Traceability Issues in Urban Runoff Regulation*, 9 CHAP. L. REV. 409, 428 (2006) (arguing that the "traceability" of runoff is an arduous regulatory task).

53. *See* Clean Water Act § 301, 33 U.S.C. § 1311 (2006).

54. Adler, *supra* note 14, at 49; Andreen, *supra* note 36, at 592. *But see* Doremus & Tarlock, *supra* note 16, at 10 (citing a 2008 Heinz Center study that found that more than half of the nation's stream waters, stream sediments, and estuarine sediments contained at least one chemical contaminant at levels threatening aquatic life).

ter."[55] That definition gets much closer to the Clean Water Act's aspirations, which are to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters," and outlines a more comprehensive understanding of water quality.[56] When evaluated by considering the range of activities that cause pollution, the point source controls within section 301 and section 302 clearly are precision tools: they prohibit only "discharges of all pollutants" from point sources, and not any of the other human activities that impair the "chemical, physical, and biological integrity" of the nation's water.[57] The "point source programs" are also the extent of the *direct* role Congress assigned to the EPA, reflecting Congress's decision to leave a significant amount of authority with the states.[58]

B. *Controlling Pollution and Nonpoint Sources*

When Congress enacted the Clean Water Act in 1972, it declared its intent to "recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources," thereby articulating a relationship between "pollution" and traditional state sovereignty in matters of land or water use.[59] During the legislative sessions leading to the Clean Water Act, states (and their lobbyists) protested against a "federal takeover," and argued that state and local agencies better understood the "local and natural variables" that influenced effective pollution control.[60]

Congress responded by inserting section 303(d), the TMDL program, which retained the traditional model for pollution control, but made that model mandatory.[61] Section 303(c)(2)(A) requires states to establish water quality standards, based on the "designated uses" of a water segment, which reinforce the tech-

55. Clean Water Act § 502(19), 33 U.S.C. § 1362(19) (2006).

56. Clean Water Act § 101(a), 33 U.S.C. § 1251(a).

57. Clean Water Act §§ 301, 302, 33 U.S.C.. §§ 1311, 1312 (2006); *see* Adler, *supra* note 14, at 36–37.

58. *See* Adler, *supra* note 14, at 54; Houck, *supra* note 39, at 10,473.

59. *See* Clean Water Act § 101(b), 33 U.S.C. § 1251(b) (2006).

60. Houck, *supra* note 39, at 10,473 (internal quotations omitted).

61. *Id.*

nology-based controls from section 301.[62] A water body can be designated to support any number of desired uses, such as a community's drinking supply, food supply, or recreational uses.[63] Once a water body has been designated for a particular use, the state promulgates "water quality criteria," or numerical limits sufficient to protect the designated use.[64] Each state must identify water bodies within its jurisdiction for which technology-based controls have been insufficient to achieve the water quality necessary to support the designated use and then rank them according to priority.[65] After listing, section 303(d) requires the state to develop a TMDL for that water body—in effect a calculation of "nonpoint source control tradeoffs."[66]

A TMDL is really a planning tool; it recognizes that technology-based controls are now producing diminishing returns, that states have already committed to permitting a particular quantity of pollutants from point sources, and that gains must be made by controlling nonpoint sources.[67] The TMDL forces the state to determine a water body's "loading capacity," or the amount of pollutants that the water body can receive without violating water quality standards.[68] From that total "loading capacity," the state must allocate an amount of pollutants to point sources (the

62. Clean Water Act § 303(c)(2)(A), 33 U.S.C. § 1313(c)(2)(A) (2006); *see also* PERCIVAL, *supra* note 41, at 715–16 (noting that the EPA has also required "antidegradation policies" designed to protect against deterioration of waters that meet water quality standards).

63. *Designated Uses*, ENVTL. PROT. AGENCY (Mar. 6, 2012), http://water.epa.gov/scitech/swguidance/standards/uses.cfm.

64. PERCIVAL, *supra* note 41, at 716. Recent EPA guidance documents encourage states to adopt biocriteria, which is a method for "describing the qualities that must be present to support a desired condition in a waterbody." *Biological Criteria*, ENVTL. PROT. AGENCY (July 19, 2012), http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/biocriteria/index.cfm. Biocriteria assess ecological factors in addition to the chemical composition of the water body, thereby presenting a more complete picture of ecosystem health. *See* Robert W. Adler, *Resilience, Restoration, and Sustainability: Revisiting the Fundamental Principles of the Clean Water Act*, 32 WASH. U. J.L. & POL'Y 139, 145 (2010). Even today, although biocriteria is a useful tool for assessing ecosystem health, the analysis relies on comparisons between observable ecological indicators within an ecosystem and "reference systems," or the expected conditions within a similar ecosystem sans human impact. *See id.* at 146–47. Not only is some human impact unavoidable, but the analyst must also judge how much deviation from the reference system is "acceptable." *Id.*

65. Clean Water Act § 303(d)(1)(A), 33 U.S.C. § 1313(d)(1)(A) (2006).

66. Clean Water Act § 303(d)(1)(C), 33 U.S.C. § 1313(d)(1)(C) (2006); *Total Maximum Daily Load—Definitions*, ENVTL. PROT. AGENCY (May 22, 2012), http://www.epa.gov/region07/water/definitions.htm.

67. *See* PERCIVAL, *supra* note 41, at 739.

68. *Total Maximum Daily Load—Definitions*, *supra* note 66.

"wasteload allocation"), an amount to nonpoint sources (the "load allocation"), and leave the remainder to provide a "margin of safety."[69] Theoretically, TMDLs cause a state's permitting authorities to reconsider permitting a particular discharge or project that would impact water quality.[70]

Conventionally, nonpoint source pollution refers to run-off, specifically run-off that evades channelization, but it is much broader.[71] "Pollution," as defined by the Clean Water Act, encompasses "man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[72] Logically, if nonpoint source pollution is any such alteration not originating from a "point source," then nonpoint source pollution encompasses diffuse sources of pollutants (such as animal wastes, fertilizers, herbicides, insecticides, atmospheric deposition, oil and grease from roadways, etc.) as well as land use or water management that physically or biologically alters aquatic ecosystems.[73]

The Clean Water Act certainly appears to provide states with the first crack at controlling water pollution—particularly pollution originating from nonpoint sources—while the lion's share of the EPA's regulatory authority is allocated toward addressing point sources.[74] However, the EPA is not without the ability to regulate nonpoint sources, though the agency was slow to exercise this authority.[75] The EPA's historical inattention to the TMDL program appears to have its roots in the "turf war" for pollution control authority, which states and localities have characterized as a matter of state sovereignty over economic development and which has continued beyond the passage of the Clean

69. *Id.* Therefore, the TMDL is the sum of the wasteload allocation and the load allocation. *Id.*

70. *Total Maximum Daily Load*, ENVTL. PROT. AGENCY (May 22, 2012), http://www.epa.gov/region07/water/tmdl.htm.

71. *What is Nonpoint Source Pollution?*, *supra* note 22.

72. Clean Water Act § 502(19), 33 U.S.C. § 1362(19) (2006).

73. Professor Adler identifies four common alterations: (1) flood control installments; (2) introduction of non-native species; (3) impoundment of rivers into reservoirs; and (4) substantial diminution of water flow caused by diversions. Adler, *supra* note 14, at 36; *see also* Benson, *supra* note 15, at 201 ("Many rivers and streams have been dramatically altered by water management activities, such as dam operations, diversions of water for off-stream uses, or other water withdrawals."); *What is Nonpoint Source Pollution?*, *supra* note 22.

74. Adler, *supra* note 14, at 66.

75. *See* Clean Water Act § 101(b), 33 U.S.C. § 1251(b) (2006); *see* PERCIVAL, *supra* note 41, at 739.

Water Act in 1972.[76] After a 1977 study by the Water Resource Council suggested using federal water quality legislation to "effect Federal purposes that were not strictly related to water quality," including what Senator Malcom Wallop decried as federal land use planning,[77] Congress amended the Clean Water Act to add section 101(g):

> It is the policy of Congress that the authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by this chapter. It is further the policy of Congress that nothing in this chapter shall be construed to supersede or abrogate rights to quantities of water which have been established by any State.[78]

In a floor statement supporting the amendment, Senator Wallop acknowledged that "legitimate" water quality considerations may have "incidental" effects on state planning practices, but emphasized that this "State's jurisdiction" amendment ensured that the Act would be used for water quality purposes only.[79]

Although the relationship between nonpoint source pollution and land or water uses likely gave the EPA pause, considering nonpoint source pollution solely a state issue artificially narrows the problem and the EPA's ability to address it.[80] Congress required the EPA to cooperate with other federal agencies, state water pollution control agencies, interstate agencies, and municipalities to "develop comprehensive programs for preventing, reducing, or eliminating the pollution of the navigable waters and ground waters."[81] The 1987 Amendments demonstrate that Congress intended nonpoint pollution controls to be implemented cooperatively and more quickly than they had been to that point.[82] First, Congress added section 101(a)(7), requiring "programs for the control of nonpoint sources of pollution be developed and im-

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76. Houck, *supra* note 39, at 10,473–74; *see* Adler, *supra* note 14, at 55.

77. Memorandum from Thomas Jorling, Assistant Adm'r for Water and Waste Mgmt., U.S. Envtl. Prot. Agency, to Regional Administrators 2–3 (Nov. 7, 1978) (emphasis omitted) (citing 123 CONG. REC. 39211 (1977) (statement of Sen. Malcom Wallop)); *see* Water Resource Policy Study Notice, 42 Fed. Reg. 36788–89 (July 15, 1977).

78. Clean Water Act § 101(g), 33 U.S.C. § 1251(g) (2006).

79. Memorandum from Thomas Jorling, *supra* note 77, at 2–3 (emphasis omitted) (citing 123 CONG. REC. 39211 (1977) (statement of Sen. Malcom Wallop)).

80. *See* Adler, *supra* note 14, at 55; Benson, *supra* note 15, at 226.

81. Clean Water Act § 102(a), 33 U.S.C. § 1252(a) (2006); *see also* Adler, *supra* note 14, at 55.

82. *See* Adler, *supra* note 14, at 66.

plemented in an expeditious manner."[83] Second, it added section 319, requiring federally approved state management programs for controlling nonpoint source pollution.[84] Section 319 also established a federal grant program to support implementation of state programs and share the costs of management.[85]

Ultimately, it took a slew of citizen's suits to spur the EPA into action.[86] Beginning with *Scott v. Hammond*, courts have consistently found that the EPA has a mandatory duty to develop TMDLs for states that have not complied with section 303(d).[87] This federal influence is consistent with section 101(b) and 101(g), because the basic decisions remain with the state, and in practice, the EPA has only indirect authority to enforce a TMDL.[88] As the Ninth Circuit acknowledged, "[s]tates must implement TMDLs only to the extent that they seek to avoid losing federal grant money; there is no pertinent statutory provision otherwise requiring implementation of § 303 plans or providing for their enforcement."[89] The other avenue for enforcement lies against a discharger who has obtained a permit in compliance with section 301: such permits must be written to be "consistent with [the] assumptions and requirements of wasteload allocations" of the EPA-approved TMDLs implemented through section 303(d).[90]

Section 303 TMDLs have become the primary tool available to the EPA for addressing nonpoint source pollution, and a significant amount of agency resources are being spent developing TMDLs in the face of state inaction.[91] But if the goal is to "restore

83. Clean Water Act § 101(a)(7), 33 U.S.C. § 1251(a)(7) (2006).

84. Clean Water Act § 319(b), 33 U.S.C. § 1329(b) (2006).

85. Clean Water Act § 319(h), 33 U.S.C. § 1329(h) (2006).

86. *See* PERCIVAL, *supra* note 41, at 739.

87. Scott v. City of Hammond, 741 F.2d 992, 998 (7th Cir. 1984) (citations omitted); *Summary of Litigation on Pace of TMDL Establishment*, ENVTL. PROT. AGENCY (Mar. 6, 2012), http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/lawsuit.cfm.

88. Adler, *supra* note 14, at 57.

89. Pronsolino v. Nastri, 291 F.3d 1123, 1140 (9th Cir. 2002) (citing Clean Water Act § 309, 33 U.S.C. § 1319 (2006); Clean Water Act § 505, 33 U.S.C. § 1365 (2006)).

90. *See* Memorandum from Robert Perciaspe, Assistant Adm'r, U.S. Envtl. Prot. Agency, to Regional Administrators (Aug. 8, 1997), *available at* http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/ratepace.cfm; *see also* Clean Water Act § 303(d), 33 U.S.C. § 1313(d) (2006).

91. *See, e.g.*, *Pronsolino*, 291 F.3d at 1140–41 (holding that section 303(d)(1) listing and TMDL requirements apply to waters impaired only by nonpoint sources of pollution); *see also* Houck, *supra* note 39, at 10,471; *Summary of Litigation on Pace of TMDL Establishment*, *supra* note 87.

and maintain the chemical, physical, and biological integrity of the Nation's waters,"[92] then are more permits and more TMDLs the most effective way to get there? Effluent limitations and TMDLs place an emphasis on controlling statutory pollutants, particularly chemical ones, but there are a number of other ways that human activities impair the chemical, physical, and biological integrity of the nation's water.[93] Furthermore, water quality cannot be divorced from water supply, particularly in the western United States where water scarcity is a very real issue.[94] Water projects that fundamentally alter the physical characteristics of a water body have negative consequences for that water body's quality and resilience.[95] Changing our approach to water management is fundamental to preserving our nation's aquatic ecosystems and our communities.[96]

II. WATER TRANSFERS, DIVERSION, AND ENVIRONMENTAL DEGRADATION

As the language of section 303 might suggest, the TMDL program is primarily a tool for addressing the chemical integrity of the nation's waters.[97] But as noted above, "man-made or man-induced alteration[s]" of the physical and biological integrity of water bodies also constitute pollution.[98] Alterations, such as

92. Clean Water Act § 101, 33 U.S.C. § 1311 (2006).

93. *See generally* Patrick J. Connolly, Note, *Saving Fish to Save the Bay: Public Trust Doctrine Protection for Menhaden's Foundational Ecosystem Services in the Chesapeake Bay*, 36 B.C. ENVT'L AFF. L. REV. 135, 140–42, 145 (2009); Gleick, *supra* note 8, at 40 ("[D]ams have destroyed the ecosystems in and around countless rivers, lakes and streams. On the Columbia and Snake rivers in the northwestern U.S., 95 percent of the juvenile salmon trying to reach the ocean do not survive passage through numerous dams and reservoirs that block their way.").

94. *See* Michael L. Connor, Comm'r, U.S. Bureau of Reclamation, Speech at the University of New Mexico Water Conference: Hard Choices: Adapting Policy and Management to Water Security (Aug. 28, 2012), http://www.usbr.gov/newsroom/speech/detail.cfm?RecordID=701 ("A third priority is ecosystem restoration. . . . We have to do that if we're going to continue to deliver water and generate power with the reliability that we've done historically.").

95. *See* Mary Jane Angelo, *Stumbling Toward Success: A Story of Adaptive Law and Ecological Resilience*, 87 NEB. L. REV. 950, 959–64, 966–67 (2009).

96. *See* WALKER & SALT, *supra* note 27, at xi; Michael L. Connor, *supra* note 94 ("The economic output associated with [the] water, energy and recreation opportunities [provided by the Bureau of Reclamation] is about $46 billion per year.").

97. Clean Water Act § 303(d)(1)(C), 33 U.S.C. § 1313(d)(1)(C) (2006). ("Each State shall establish . . . the total maximum daily load for those pollutants . . . .").

98. *See supra* note 73 and accompanying text; Clean Water Act § 502(19), 33 U.S.C. § 1362(19) (2006).

dams, channelization, and diversions degrade aquatic ecosystems and impair designated uses.[99] The EPA considers hydrologic modifications—such as intentional flooding, damming, channelization, diversions, and other physical alterations to water bodies—to be the second-leading source of water quality impairments in lakes.[100] Some of the most dramatic, and visible, impacts on our nation's waterways come from hydrologic modifications, such as the management projects that have significantly altered one of the nation's most iconic landmarks: the Florida Everglades.[101]

The Everglades are a network of interconnected lakes, rivers, freshwater marshes, tree islands, pinelands, and swamps that historically stretched over approximately 6500 square miles of southern Florida.[102] The region's uniquely fertile soil eventually led to proposals to drain the Everglades into the Atlantic Ocean,[103] and ultimately to the formation of a federal, state, and local endeavor, the Central and Southern Florida Project for Flood Control and Other Purposes, pursuant to which the Army Corps of Engineers constructed a vast array of levees, canals, and pumps.[104] Those modifications have enabled significant development throughout the region; today only about half of the original Everglades are "protected" areas.[105] Those modifications have also threatened the region's biodiversity and its ability to absorb fluctuations in weather conditions.[106] The altered hydrology and

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99. Benson, *supra* note 15, at 232.

100. *Id.* at 201 (citing ENVTL. PROT. AGENCY, 2000 NAT'L WATER QUALITY INVENTORY 22–23 (2002), *available at* http://www.epa.gov/305b/2000report). The leading source of impairment was agriculture. Benson, *supra* note 15, at 201 n.6 (citing 2000 NAT'L WATER QUALITY INVENTORY, *supra* at 22–23).

101. WALKER & SALT, *supra* note 27, at 16, 17; *see* Adler, *supra* note 14, at 69; *see also* S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians, 541 U.S. 95, 99–100 (2004).

> Historically, that land was itself part of the Everglades, and its surface and ground water flowed south in a uniform and unchanneled sheet. Starting in the early 1900's, however, the State began to build canals to drain the wetlands and make them suitable for cultivation. . . . These improvements fundamentally altered the hydrology of the Everglades, changing the natural sheet flow of ground and surface water.

Miccosukee, 541 U.S. at 99–100. (describing the process of converting what was once wetlands into sugar cane fields and residential developments). The conversion continues to affect the remaining wetland ecosystems. *Id.* at 101.

102. WALKER & SALT, *supra* note 27, at 16.

103. *See id.* at 18–19.

104. *Id.* at 20–21.

105. *Challenges to the Everglades*, FRIENDS OF THE EVERGLADES, http://www.everglades.org/challenges-to-the-everglade/ (last visited Apr. 19, 2013).

106. WALKER & SALT, *supra* note 27, at 21–24.

resulting degradation of water quality impacts the entire socio-ecological system.[107]

From that vast array of pumps, canals, and water impoundments used to continually drain land that would otherwise be part of the Everglades, a specific canal and pump became the subject of a 2004 United States Supreme Court case, *South Florida Water Management District v. Miccosukee Tribe of Indians*.[108] The C-11 canal collects groundwater and rainwater from a populated area in Broward County.[109] The S-9 pump drives water out of the canal and into undeveloped wetlands ("WCA-3") where it is impounded by levees.[110] Without the levees, the water would naturally flow back and flood the residential areas.[111] During the water's trip into WCA-3, it collects substantial amounts of phosphorus, which is then conveyed by the S-9 pump into the undeveloped portions of wetland.[112] The Miccosukee Tribe argued that the operation violated section 301's prohibition on discharges and required a NPDES permit, because S-9 was a "point source," and its operation resulted in the "discharge of [a] pollutant."[113]

The EPA argued—on behalf of the South Florida Water Management District—that engineered transfers of one "navigable water" into another "navigable water"—or "water transfers"—do not result in the "addition of any pollutant."[114] The EPA called its argument the "unitary waters" theory and based it on the definition of "pollutant discharge," which requires an "addition of [a] pollutant."[115] Its theory posited that all waters of the United States should be viewed as one.[116] Therefore, when water from one water body is pumped, unaltered, into another water body, no "addition" occurs and no permit is required "even if one water

107. *Id.* at 15 ("And what's at risk is not just the 'nature' portions of the system . . . but the hydrological changes [sic] impact on the economic prosperity and social stability of the broader region that now supports over 6 million people.").

108. S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians, 541 U.S. 95, 100–01 (2004).

109. *Id.* at 100.

110. *Id.* at 100–01.

111. *Id.*

112. *Id.* at 101–02. The District conceded that C-11 and WCA-3 are "navigable waters" and that phosphorus was a pollutant. *Id.* But it argued that the operation did not constitute the "discharge of [a] pollutant." *Id.* at 103.

113. *Id.* at 102–03 (alteration in original).

114. *See id.* at 106, 109.

115. *Id.* at 106.

116. *Id.* at 105–06.

body were polluted and the other pristine, and the two would not otherwise mix."[117] The EPA argued that its interpretation gave effect to section 304(f)(2)(F) of the Clean Water Act and protected the states' role in land use and water management.[118]

The Court declined to address the unitary waters theory head-on and remanded the case, finding that "further development of the record is necessary" to determine whether the C-11 canal and WCA-3 are "meaningfully distinct."[119] The tribe emphasized that the canal and the wetlands possessed different "biological or ecosystem characteristics," while the district identified "close hydrological connections" between the water bodies.[120] The Court reasoned that if the canal and the wetlands were not "meaningfully distinct"—and were, in fact, the same water body—then there could be no addition of pollutant and no permit would be required.[121] But this reasoning obfuscates the fact that the water transfers at issue in *Miccosukee* have undoubtedly altered the hydrology of the Everglades at the expense of the region's water quality and the watershed's ability to support an increasing human population and other burdens.[122] Today's Everglades are highly sensitive to both drought and periods of extreme rain due to reduced water flow through the region.[123] Reduced water flow stemming from hydrologic modifications and overconsumption has become an increasingly visible issue throughout the United States, especially in the west where the country is "generally arid."[124]

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117. *Id.* at 106 (citing Catskill Mountains Chapter of Trout Unlimited, Inc. v. City of New York, 273 F.3d 481, 492 (2d Cir. 2001); Dubois v. U.S. Dep't of Agric., 102 F.3d 1273 (1st Cir. 1996)).

118. *Id.*; *see also* Clean Water Act § 304(f)(F), 33 U.S.C. § 1314(f)(F) (directing the administrator to consult and collaborate with state water pollution control agencies regarding hydrologic modifications).

119. *Miccosukee*, 541 U.S. at 112.

120. *Id.* at 110 (quoting Transcript of Oral Argument at 43, S. Fla. Water Mgmt. Dist. v. Miccousukee Tribe, 541 U.S. 95 (2004) (No. 02-626)).

121. *Id.* at 107–09, 112. However, the Court did not endorse a particular test for evaluating whether water bodies are distinct or one and the same. *Id.* at 111.

122. *See* WALKER & SALT, *supra* note 27, at 25.

123. *See id.* at 25–26.

124. *See, e.g.*, Brief for Colorado and New Mexico as Amici Curiae Supporting Petitioner, *Miccosukee*, 541 U.S. 95 (2004) (No. 02-626), 2003 WL 22137032, at *2 ("West of the 100th Meridian, the nation is generally arid; that is, it receives less than the thirty inches of annual precipitation necessary to sustain non-irrigated agriculture."); Peter Bock, *The Water Scarcity Reality*, RENEWABLE ENERGY WORLD (Mar. 22, 2013), http://www.renewableenergyworld.com/rea/blog/03/the-water-scarcity-reality; *Hydrologic Modification*,

Water transfers have played a major role in shaping the development of the western United States. A complex array of diversions provide water to western United States cities and farms—in Colorado, for instance, forty-nine "major" diversions transfer approximately 550,000 acre feet of water to other basins each year.[125] Water supply infrastructure allows some ten million acres of western land to be irrigated and provides over thirty-one million people with water.[126] After *Miccosukee*, the EPA promulgated the "Water Transfer Rule" to avoid "unnecessarily" burdening water management activities throughout the United States.[127] The Water Transfer Rule exempted any activity that "conveys or connects waters of the United States without subjecting the transferred water to intervening industrial, municipal, or commercial use" from the NPDES permitting requirements.[128] The rule touched off a firestorm of litigation; five suits were filed in the circuit courts and two more were filed in district courts.[129] Petitioners seeking invalidation of the rule included nine states and a Canadian province, while intervenors on behalf of the EPA included state water agencies that allocate and distribute water for domestic, agricultural, and industrial purposes.[130] The intervenors asserted that requiring NPDES permits would substantially increase their administrative burdens and costs while reducing the amount and reliability of water supplies.[131] Meanwhile, the petitioners argued that water transfers facilitate "toxic algae blooms, [and] introduce invasive species, chemicals, and other pollutants."[132] Multiple suits were consolidated in the Eleventh Circuit under *Friends of the Everglades v. EPA*, which ultimately

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BARATARIA-TERREBONNE NATIONAL ESTUARY PROGRAM, http://www.btnep.org/BTNEP/estuaryissues/Hydrology.aspx (last visited Apr. 19, 2013).

125. Brief for Colorado and New Mexico, *Miccousukee*, 541 U.S. 295 (No. 02-626), 2003 WL 22137032, at *2–3. ("Sixty percent of Coloradans depend on transbasin diversions/deliveries for at least part of their domestic supplies. In addition, over fifty percent of Colorado's irrigated farmland relies on transbasin diversions/deliveries.").

126. Michael L. Connor, *supra* note 94.

127. Water Transfers Rule, 73 Fed. Reg. 33697, 33700 (June 13, 2008), *codified at* 40 C.F.R. § 122.3(i) (2012).

128. 40 C.F.R. § 122.3(i) (2012).

129. Jeff Kray, *Environmental Groups Challenge Inter-Basin Water Transfers Rule*, 243 ENVTL. COUNSELOR 6, 7 (Nov. 2008).

130. *Id.* at 8; Friends of the Everglades v. EPA (*Friends II*), 699 F.3d 1280, 1280 (11th Cir. 2012).

131. Kray, *supra* note 129, at 8.

132. *Id.* at 7 (citing Jeff Kinney, *Environmentalists, Tribe Challenge EPA Rule Allowing Water Transfers Without Permits*, 39 ENV'T REP., (BNA) 1366 (July 4, 2008)).

dismissed the case on jurisdictional grounds, leaving the Water Transfer Rule in effect.[133]

Certainly, the importance of water diversion facilities to western communities cannot be understated. Furthermore, because these facilities (dams, headgates, or a combination of both) generally require a Clean Water Act section 404 permit issued by the U.S. Army Corps of Engineers, the amicus curiae correctly noted that their projects were already subject to federal permitting requirements.[134] The section 404 permitting process triggers the certification provisions of section 401, which requires any applicant for a federal license or permit to obtain certification from the state that any discharge will not violate any water quality standard or other requirement of the Clean Water Act.[135] The discharge need not add "pollutants"[136] and the EPA regulations require the state to find and certify that "there is a reasonable assurance that the activity will be conducted in a manner which will not violate applicable water quality standards."[137] While that language appears expansive on its face, a state's authority to restrict an activity pursuant to section 401 is limited.[138] A state may only require compliance with "any applicable effluent limitations and other limitations, under section [301] or [302]" and other appropriate standards of the Act or state law.[139]

A state's authority to impose conditions on a project is somewhat strengthened by section 303 and the TMDL program, which section 301 incorporates by reference.[140] As a result, states may enforce state water quality standards adopted pursuant to section

133. *Friends II*, 699 F.3d at 1283, 1285, 1289. An earlier suit, *Friends I*, upheld the water transfer rule (and the "unitary waters theory") pursuant to the *Chevron* doctrine. Friends of the Everglades v. S. Fla. Water Mgmt. Dist. (*Friends I*), 570 F.3d 1210, 1228 (11th Cir. 2009).

134. Brief for Colorado and New Mexico as Amici Curiae Supporting Petitioner, S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians, 541 U.S. 95 (2004) (No. 02-626), 2003 WL 22137032, at *26, n.31. Section 404 requires permits for the discharge of "dredged or fill material into the navigable waters." Clean Water Act § 404(a), 33 U.S.C. § 1344(a) (2006). Such permits are generally necessary to build a reservoir, channelize within a stream, develop in wetlands, and other similar activities. Adler, *supra* note 14, at 64.

135. Clean Water Act § 401, 33 U.S.C. § 1341 (2006).

136. *See* S.D. Warren Co. v. Me. Bd. of Envtl. Prot., 547 U.S. 370, 383, 385 (2006).

137. 40 C.F.R. § 121.2(a)(3) (2012); *see also* PUD No. 1 of Jefferson Cnty. v. Wash. Dept. of Ecology, 511 U.S. 700, 712 (1994).

138. *Pud No. 1*, 511 U.S. at 712.

139. Clean Water Act § 401(d), 33 U.S.C. § 1341(2) (2006); *see also PUD No. 1*, 511 U.S. at 712.

140. *See PUD No. 1*, 511 U.S. at 713.

303 by requiring water management activities to be compatible with a water body's designated use.[141] But it also follows that effective protection relies on the relative strength of a state's law.[142] While states must identify "flow impaired" waters within their integrated report, the listing is not made pursuant to section 303(d)(1) and, as a result, no TMDL must be established even though low flows—and the human activities that cause flow impairment—"are legally relevant to the establishment of TMDLs for identified pollutants."[143] Despite its legal relevance, flow is not a "pollutant;" and TMDLs do not allocate activities, but pollutants.[144] States have taken varying approaches to address flow impairment in order to better support downstream users and ecosystems, and have had varying degrees of success at maintaining adequate instream flows.[145] Dry streambeds during the irrigation season remain common sights due to diversions for agricultural use or domestic consumption.[146]

So, although the distinction between water quality and water quantity is, as the Supreme Court once stated, "artificial,"[147] addressing the issue may require other solutions not contemplated by the Clean Water Act—such as reuse programs. Impaired flow, another name for water scarcity, is a very real problem for socio-

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141. *Id.*

142. *See* Benson, *supra* note 15, at 216–17.

143. *Id.* at 237; *see also* ENVTL. PROT. AGENCY, GUIDANCE FOR 2006 ASSESSMENT, LISTING AND REPORTING REQUIREMENTS PURSUANT TO SECTIONS 303(d), 305(b), AND 314 OF THE CLEAN WATER ACT 56 (2005), *available at* http://www.epa/gov/owow/tmd/2006 IRG/report.pdf. The EPA recommended that the states prepare their 2012 integrated reports according to the 2006 guidance. Memorandum from Denise Keehner, Dir., Office of Wetlands, Oceans, and Watersheds, to Water Division Directors (Mar. 21, 2011), *available at* http://water.epa.gov/;awsregs/lawsguidance/cwa/tmdl/ir-memo-2012.cfm#CP_jump_5357B1.

144. *See* Va. Dep't of Trans. v. EPA, No. 1:12-CV-775, 2013 BL 2384, at *3–4 (E.D. Va. 2012).

145. *See* Benson, *supra* note 15, at 231, 241–42. State reporting methods are highly inconsistent, making it difficult to ascertain the extent of the problem. *See generally* U.S. GOV'T ACCOUNTABILITY OFFICE, WATER QUALITY: INCONSISTENT STATE APPROACHES COMPLICATE NATION'S EFFORTS TO IDENTIFY ITS MOST POLLUTED WATERS (2002), *available at* http://www.gao.gov/new.items/d02186.pdf. Professor Benson attributes some reporting inconsistencies to political will. *See* Benson, *supra* note 15, at 242.

146. *See* Benson, *supra* note 15, at 230–31 (citation omitted). *See generally* Sarah Gilman, Op-ed., *Colorado Water Diversions, Urban and Rural*, HIGH COUNTRY NEWS (Mar. 19, 2012), http://www.hcn.org/issues/44.5/colorado-water-diversions-urban-and-rural (anecdotal editorial describing dry streambeds).

147. PUD No. 1 of Jefferson Cnty. v. Wash. Dept. of Energy, 511 U.S. 700, 719–20 (1994).

ecological systems in the United States.[148] Low flows increase the relative concentration of pollutants, resulting in water quality violations and compromised designated uses.[149] Quite simply, if there is no water, then there is no use.

III. THE LOS ANGELES RIVER: EFFLUENT DOMINATION

On October 11, 2011, the ghost of the *Miccosukkee* opinion rose from the Everglades to haunt Supreme Court chambers, but in a decidedly different context than the agricultural and suburban landscape of Broward County. The Los Angeles River is—without a doubt—an urban river.[150] In modern times, the river has been the site of more Hollywood car chases than vineyards or orange groves,[151] and it has been subjected to innumerable modifications to divert flow for domestic uses and to prevent flooding during rainy seasons.[152] A 2001-2002 annual report by the Southern California Coastal Water Research Project characterized the Los Angeles River as an "effluent-dominated" waterbody after tracing approximately 70% of the river's volume to treated effluent discharged by urban sources.[153] Although the Los Angeles Regional Water Quality Control Board has added much of the river and its tributaries to the state section 303(d) list, water quality, water quantity, habitat loss, and inadequate riverbed remain concerns.[154]

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148. *See* Michael L. Connor, *supra* note 94.

149. Benson, *supra* note 15, at 229, 236.

150. Susan Harris, Note, *'Pigs Will Fly': Protecting the Los Angeles River by Declaring Navigability*, 39 B.C. ENVTL. AFF. L. REV. 185, 191 (2012).

151. *Id.* at 185, 188.

152. *Id.* at 189–90; *see also* Judith Coburn, *Whose River Is It, Anyway?: More Concrete Versus More Nature: The Battle Over Flood Control on the Los Angeles River Is Really a Fight for Its Soul*, L.A. TIMES, Nov. 20, 1991 (magazine), at 18. ("The remaking of the L.A. River was a confluence of the Depression's national romance with flood-control projects, the era's faith in Big Government, a desperate need for jobs and New D[e]al pork-barrel politics. . . . By 1960, the city had built itself a concrete watershed.").

153. Drew Ackerman, *Characterization of Water Quality in the Los Angeles River*, *in* SO. CAL. COASTAL WATER RESEARCH PROJECT 2001-02 ANNUAL REPORT 86, 89 (2002), *available at* http://www.sccwrp.org/DocumentsAnnualReports/BrowseAllAnnualReports/2001-02AnnualReport.aspv.

154. Harris, *supra* note 150, at 191; CAL. REG'L WATER QUALITY CONTROL BD., L.A. REGION, CLEAN WATER ACT SECTION 305(b) REPORT AND SECTION 303(d) LIST OF IMPAIRED WATERS: 2008 UPDATE 1, 18–19 (2009), *available at* http://www.swrcb.ca.gov/rwqcb4/water_issues/programs/303d/2008_integrated_report_303 (d) _revised_list.shtml.

The river's headwaters can be found near the Canoga Park High School football field where two concrete walls meet, marking the confluence of Bell and Calabasas Creeks.[155] From Canoga Park, the river runs fifty-one miles to Long Beach and the Pacific Ocean.[156] Along the way, thousands of storm drains within the watershed, from multiple municipalities, collect and channel stormwater runoff to the Los Angeles County Flood Control District's (the "District") "extensive flood-control and storm-sewer infrastructure," which—in turn—channels the untreated runoff to various waterbodies, including the Los Angeles River.[157] Each system of drains, conveyances, and outfalls is known as a municipal separate storm sewer system ("MS4"), and the District operates the largest system in the region.[158]

All MS4s are point sources by definition, and all MS4s are subject to regulation through the NPDES permitting program.[159] As a result, MS4 operators must ensure that their discharge complies with the technology-based effluent limitations established by their permit and does not violate any more stringent water quality standards.[160] Finally, NPDES permits require the permitholder to comply with additional water monitoring and public reporting obligations.[161]

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155. *See* Douglas Carstens et al., *Isn't That Special?: The EPA's Special-Case Determination for the Los Angeles River Extends Clean Water Act Protections Cast in Doubt by the Army Corp and the United States Supreme Court*, 4 GOLDEN GATE U. ENVT'L. L. J. 251, 254 (2011); THE RIVER PROJECT, *Headwaters of the Los Angeles River* (2011), http://www.theriverproject.org/learn/know-your-watershed/the-los-angeles-river-watershed/headwaters-of-the-los-angeles-river.

156. Carstens, *supra* note 155, at 254.

157. NRDC v. Los Angeles, 636 F.3d 1235, 1236–38 (9th Cir. 2011). Urban stormwater runoff "collects 'suspended metals, sediments, algae-promoting nutrients (nitrogen and phosphorus), floatable trash, used motor oil, raw sewage, pesticides, and other toxic contaminants[.]'" *Id.* at 1237 (alteration in original) (quoting Envtl. Def. Ctr., Inc. v. EPA, 344 F.3d 832, 840 (9th Cir. 2003)).

158. *See id.* at 1237–38, 1237 n.1 ("[The District's] infrastructure includes 500 miles of open channels and 2,800 miles of storm drains."); Russell Prugh, *Supreme Court Preview: The 2012/2013 Docket:* L.A. County Flood Control District v. Natural Resources Defense Council, MARTEN LAW (Oct. 8, 2012), http://www.martenlaw.com/newsletter/20121008-la-county-flood-control-district-v-nrdc.

159. *See* Clean Water Act § 502(14), 33 U.S.C. § 1362(14) (2006); *Los Angeles*, 636 F.3d at 1238–39.

160. Clean Water Act § 402, 33 U.S.C. § 1342 (2006); *see Los Angeles*, 636 F.3d at 1239.

161. *Los Angeles*, 636 F.3d at 1239; *see also* Victor B. Flatt, *Spare the Rod and Spoil the Law: Why the Clean Water Act Has Never Grown Up*, 55 ALA. L. REV. 595, 598, 605 (2004) (describing NPDES reliance on self-monitoring and reporting for effective enforcement).

A. Los Angeles Flood Control District v. NRDC

The EPA authorized California to establish water-quality standards for the waters within its jurisdiction and to issue NPDES permits through the State Water Resources Control Board and nine regional boards.[162] The permit issued to the District also applies to Los Angeles County and the eighty-four incorporated cities operating MS4s connecting to the District's sprawling system but deems the District the "Principal Permitee."[163] The permit incorporates the Water Quality Control Plan for the Los Angeles Region, which establishes the designated uses for surface waters in the region, and the water quality standards necessary to achieve and protect those uses.[164] And, although the District, as Principal Permittee, is responsible for coordinating and facilitating "activities necessary to comply" with the permit—including implementing the self-monitoring program—it is *not* responsible for ensuring compliance by any individual permittee.[165] Rather, each permittee possesses "adequate legal authority" to require compliance within their jurisdiction and to conduct inspections, surveillance, and monitoring as necessary to determine compliance.[166] As a result, all permitees are responsible for "assur[ing] that storm water discharges from the MS4 shall neither cause nor contribute to the exceedance of water quality standards and objectives nor create conditions of nuisance in the receiving waters, and that the discharge of non-storm water to the MS4 has been effectively prohibited."[167]

After high levels of heavy metals and fecal bacteria, among other pollutants, were identified by mass-emissions monitoring stations for four watershed rivers (Los Angeles River, San Gabriel

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162. *Los Angeles*, 636 F.3d at 1240.

163. Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges Within the County of Los Angeles, and the Incorporated Cities Therein, Except the City of Long Beach, Order No. 01-182, NPDES Permit No. CAS004001, Cal. Reg'l Water Control Bd., at 31 (Dec. 13, 2001), as amended on Sept. 14, 2006 by Order R4-2006-0074; Aug. 9, 2007 by Order R4-2007-0042; Dec. 10, 2009 by Order R4-2009-0130; and Nov. 8, 2012 by Order R4-2012-0175 [hereinafter Order No. 01-182].

164. *Los Angeles*, 636 F.3d at 1240.

165. Order No. 01-182, *supra* note 163, at 31. The permit makes the District responsible for implementing the monitoring program, providing technical and administrative assistance to co-permittees, and providing personnel and fiscal resources. *Id.*

166. *Id.* at 34.

167. *Los Angeles*, 636 F.3d at 1240–41 (quoting Order No. 01-182, *supra* note 163 at 24).

River, Santa Clara River, Malibu Creek), the Natural Resources Defense Council ("NRDC") brought a citizen's suit against the District to establish its liability for the exceedances.[168] The District conceded that its MS4 conveys pollutants but argued that the NRDC had failed to demonstrate that the District was directly responsible for the measured violations because its system also conveys the "collective discharges" of "'up-sewer' municipalities."[169]

The NRDC's theory of liability resembled "severable liability"[170]—the Ninth Circuit summed up the environmental group's rationale in four steps:

> (1) [T]he Permit sets water-quality limits for each of the four rivers; (2) the mass-emissions stations have recorded exceedances of those standards; (3) an exceedance is non-compliance with the Permit and, thereby, the Clean Water Act; and (4) Defendants, as holders of the Permit and operators of the MS4, are liable under the Act.[171]

The Ninth Circuit agreed with the district court that this argument improperly interpreted the Clean Water Act.[172] The question, it argued, is not whether there were measured exceedances in the rivers, but whether the District was responsible for *adding* the excess pollutants to the rivers.[173] However, the location of the monitoring stations complicated what should have been a relatively simple inquiry.[174] Because the monitoring stations are located in the rivers, and not at an outfall, the stations could only show that *en masse* the District and its co-permittees had discharged excess pollutants violating water quality standards.[175]

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168. *Id.* at 1242–44.

169. *Id.* at 1243.

170. *See* Rhead Enion, *L.A. River Oral Argument: The Justices Debate How to Tell the Ninth Circuit that It Screwed Up*, LEGALPLANET (Dec. 6, 2012), http://legalplanet.wordpress.com/2012/12/06/la-river-oral-argument-the-justices-debate-how-to-tell-the-ninth-circuit-that-it-screwed-up/.

171. *Los Angeles*, 636 F.3d at 1244.

172. *See id.* at 1250–51.

173. *Id.* at 1251; *see also* Clean Water Act § 502(12), 33 U.S.C. § 1362(12) (2006) ("The term 'discharge of a pollutant' . . . means . . . any addition of any pollutant to navigable waters from any point source . . . .").

174. *See* Kevin Russell, *Argument Recap: Now that We All Agree the Ninth Circuit was Wrong . . .* , SCOTUSBLOG (Dec. 6, 2012), http://www.scotusblog.com/2012/12/argument-recap-now-that-we-all-agree-the-ninth-circuit-was-wrong/.

175. *Los Angeles*, 636 F.3d at 1242, 1250; Transcript of Oral Argument at 11–22, Los Angeles Cnty. Flood Control Dist. v. NRDC, 133 S. Ct. 710 (2013) (No. 11-460) (argued Dec. 4, 2012); *see also* Russell, *supra* note 174.

Despite a relatively low standard of proof set by the district court, the NRDC could not show—with available data based on the monitoring stations—that some amount of a standard-exceeding pollutant was being discharged through at least one District outfall.[176] However, the Ninth Circuit made a controversial distinction between the rivers: in the Los Angeles River and San Gabriel River, the monitoring stations were located within river segments lined with concrete for flood control purposes, while the monitoring stations in Santa Clara River and Malibu Creek were not.[177] As a result, the Ninth Circuit seemed to imply that—in the case of the Los Angeles and San Gabriel Rivers—the monitoring stations were within the District's MS4, and, therefore, so were the pollutants at the time of detection.[178] The Ninth Circuit found that a "discharge" occurred when the pollutant-laden water left the channelized segment and entered the "navigable" waterways, and held the District liable for the exceedances in the Los Angeles and San Gabriel Rivers.[179]

The District petitioned the Supreme Court, arguing that no discharge could occur when water is channeled from one portion of a river to another portion of the *same* river—after all, a river cannot be "meaningfully distinct" from itself.[180] At argument before the Court, the NRDC declined to justify the Ninth Circuit's rationale; instead it presented its original "severable liability" theory.[181] And while none of the justices appeared to seriously doubt that the District's MS4 discharges the pollutants that it collects and conveys from the infrastructure of its co-permittees, none of the justices appeared to find the NRDC's theory particu-

176. *See* NRDC v. Los Angeles, No. 08-1467, 2010 WL 761287, at *8 (C.D. Cal. Mar. 2, 2010) ("Plaintiffs would need to present some evidence (monitoring data or an admission) that some amount of a standards-exceeding pollutant is being discharged through at least one District outlet.").

177. *Los Angeles*, 636 F.3d at 1242.

178. *Id.* at 1237 ("Specifically, Plaintiffs provided evidence that the monitoring stations for the Los Angeles and San Gabriel rivers are located in a section of ms4 owned and operated by the District and, after stormwater known to contain standards-exceeding pollutants passes through these monitoring stations, this polluted stormwater is discharged into the two rivers.").

179. *Id.* at 1237, 1252, 1254.

180. Brief of Petitioner at 21–22, Los Angeles Cnty. Flood Control Dist. v. NRDC, 133 S. Ct. 710 (2013) (No. 11-460), 2012 WL 3945845, at *21–22 (citing S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians, 541 U.S. 95, 112 (2004)); *Miccosukee*, 541 U.S. at 109.

181. *See* Transcript of Oral Argument at 34, Los Angeles Cnty. Flood Control Dist. v. NRDC, 133 S. Ct. 710 (2013) (No. 11-460) (argued Dec. 4, 2012); Russell, *supra* note 174.

larly workable or fair, given the chance that excess pollutants could have originated directly from upstream co-permittees.[182]

B. *What Does It All Mean?*

This comment has presented two major Clean Water Act cases revolving around the "discharge of pollutants," but the circumstances reveal deeper unresolved issues. Would victory for environmentalists in either case have restored the ecological function of either waterbody? And, for that matter, would it be reasonable (or possible) to turn off the S-9 pump and flood Broward County or remove the concrete from the bed of the Los Angeles River? The answer to both questions is clearly no. We need water to drink, to irrigate our crops, and to support our communities—but so do future generations. Currently, we are undermining the health of future generations and depleting the earth's natural resources, including clean water.[183] Between 1992 and 2005, the United States' ecological footprint grew 21%, and, as a nation, we consume twice our biocapacity.[184]

The "urban" water cycle illustrates our socio-economic dependency on water: large withdraws and diversions upstream for domestic, agricultural, and industrial uses reduce flow in one segment while sewage effluent downstream dominates another segment.[185] Even with modern water reclamation technology and facilities, the cycle compromises designated uses of waterbodies and is neither ecologically nor hydrologically sustainable.[186] We live in a socio-ecological system where human activities affect—and are affected by—our environment.[187] The links between our needs and aquatic health require "closing the loop"[188] and recognizing that water supply, stormwater management, wastewater

182. *See* Russell, *supra* note 174.

183. *See* PERCIVAL, *supra* note 41, at 5.

184. *Id.*

185. Vladimir Novotny, *Effluent Dominated Water Bodies, Their Reclamation and Reuse to Achieve Sustainability*, *in* CITIES OF THE FUTURE: TOWARDS INTEGRATED SUSTAINABLE WATER AND LANDSCAPE MANAGEMENT 191, 195 (Vladimir Novotny & Paul Brown eds., 2007).

186. *Id.* at 197; *see also* SWITCH: SUSTAINABLE WATER MANAGEMENT IN THE CITY OF THE FUTURE 75 (C.A. Howe et al. eds., 2011), *available at* http://www.switchurban water.eu/outputs/pdfs/SWITCH_-_Final_Report.pdf (describing the demand on depleted groundwater levels, high energy costs of treatment, and resulting waste).

187. *See* WALKER & SALT, *supra* note 27, at 32.

188. Novotny, *supra* note 125, at 200.

disposal, groundwater levels, stream flow, and water quality are inextricably linked and should be managed as a unit.[189] Although efforts to take more comprehensive approaches to these issues are gaining traction in the United States, many "watershed" programs lack the legal authority to require uniform, sustainable practices.[190]

IV. CREATING INTERDISCIPLINARY WATERSHED AGENCIES

The Clean Water Act's treatment of discharges is not the panacea to our water quality and quantity problems.[191] Additionally, as the nation's population continues to grow, it will be increasingly challenging to supply communities with enough water to support current consumption levels, not to mention ensuring that there is sufficient flow to maintain aquatic ecosystems.[192] And, as this comment has argued, degraded ecosystems go hand-in-hand with degraded water quality and degraded quality of life in our nation's communities—with a disproportionate impact on impoverished communities.[193] A more comprehensive approach that considers ecological, economic, and social interests holistically will be key to developing a more sustainable water use framework.

A. *The Foundations in Place: Chesapeake Bay Program*

In 2000, Professor Robert Adler surveyed four major watersheds and the cooperatives that balance water quality, management, and allocation within those watersheds.[194] Although each cooperative addressed water quality, water quantity, and ecosystem protection in tandem, he concluded that none of the programs ultimately alter the "basic existing allocation of authority" over

189. *Id.*; *see* SWITCH, *supra* note 186, at 69.

190. *See* Novotny, *supra* note 185, at 201, 211.

191. Clean Water Act § 101, 33 U.S.C. § 1251 (2006).

192. *See* Gleick, *supra* note 8.

193. *See* Renee Skelton & Vernice Miller, *The Environmental Justice Movement*, NAT. RES. DEF. COUNCIL (Oct. 12, 2006), http://www.nrdc.org/ej/history/hej.asp. *See generally Environmental Sustainability*, NATIVE AM. RIGHTS FUND, http://www.narf.org/ about/sustainability.html (last visited Apr. 9, 2012); Gleick, *supra* note 8.

194. *See generally* Adler, *supra* note 33, at pt. III (examining the institutional framework of the CALFED Bay-Delta Program, the Central and South Florida Project, the Colorado River Basin Salinity Control Program, and the Chesapeake Bay Commission); Doremus & Tarlock, *supra* note 16, at 33 (discussing the failure of CALFED to "produce the results it had promised").

water quality and quantity.[195] Each program is a major step towards a holistic watershed approach to sustainable water usage, but none can alter basic authority because none of the programs has a "hammer."[196] The threat of enforcement is nonexistent and so compliance becomes voluntary.

The Chesapeake Bay Program is likely the most integrated cooperative Professor Adler discussed.[197] The Chesapeake Bay watershed is approximately 64,000 square miles—from its headwaters in the Appalachians, through Piedmont farms, to suburbs, some of the country's largest metropolises, and some of the country's heaviest industry.[198] The Bay and its tributaries once supported one of the most productive ecosystems on earth and, despite severe declines, the Bay continues to support Mid-Atlantic economies and ecosystems.[199]

The Chesapeake Bay Program formed pursuant to the 1983 Chesapeake Bay Agreement, which recognized a "historical decline" in the health of the Bay and the need for a cooperative approach for "management decisions."[200] The agreement created an executive council comprised of the governors of Maryland, Pennsylvania, and Virginia; the mayor of the District of Columbia; the administrator of the U.S. Environmental Protection Agency; and the chair of the Chesapeake Bay Commission.[201] To strengthen accountability and facilitate implementation, the executive council formed an action team to initiate evaluations performed by a "nationally recognized, independent science organization."[202] A management board provides planning, sets priorities, and issues guidance to interdisciplinary "goal implementation teams" for

195. Adler, *supra* note 33, at 55, 64–65.

196. *See id.* at 55.

197. *See id.* at 64–65.

198. *Id.* at 28.

199. *Id.* at 29.

200. *The Chesapeake Bay Agreement of 1983*, CHESAPEAKE BAY PROGRAM (2012), http://www.chesapeakebay.net/about/how/history.

201. *History*, CHESAPEAKE BAY PROGRAM (2012), http://www.chesapeakebay.net/documents/1983_C.B.Argreement2.pdf. The Chesapeake Bay Commission is the legislative arm of the Chesapeake Bay Program and advocates to the general assemblies of Maryland, Virginia, and Pennsylvania. *About the Commission*, CHESAPEAKE BAY COMM'N, http://www.chesbay.us/about.htm (last visited Apr. 19, 2013).

202. *Independent Evaluator Action Team*, CHESAPEAKE BAY PROGRAM (2012), http://www.chesapeakebay.net/groups/group/independent_evaluator_action_team.

comprehensive and coordinated action.[203] The executive council also receives input from a citizen's advisory committee, a local government advisory committee, and a scientific and technical advisory committee, thereby increasing visibility and accountability.[204]

The Program's organizational structure ensures complete ventilation of key issues, incorporation of scientific and technical expertise, and political participation.[205] The Chesapeake Bay Program issues memoranda and guidance integrating the work of more than twenty-five different federal agencies.[206] It is well-funded, and its high-profile membership reflects the Bay's importance to the Mid-Atlantic's ecological and economic welfare.[207]

The Chesapeake Bay Program's distinctive organization permits it to devote significant resources to studying a wide range of issues—nonpoint sources, loss of wetlands, alterations of habitat, population growth, and land use—and develop integrated strategies for addressing impairments stemming from these issues.[208] Its focus on land use and development, rather than water allocation and management, likely reflects the differences in western and eastern water law,[209] but it is easy enough to imagine copying the program in California or Colorado and integrating western issues as well. A comprehensive watershed approach is necessary for developing in a sustainable manner and ensuring that our water resources are healthy enough to support our communities. Our land use decisions impact the health of our streams, rivers, and estuaries by spreading our demands throughout sprawling suburbs, converting valuable lands and natural filters into im-

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203. *Organization*, CHESAPEAKE BAY PROGRAM (2012), http://www.chesapeakebay.net/about/organized. Goal implementation teams are responsible for individual issues affecting the Bay: fisheries, habitats, water quality, watershed health, and fostering grassroots programs. *Id.*

204. *See id.*; Adler, *supra* note 33, at 32–33.

205. *See* Adler, *supra* note 33, at 32–33.

206. *Id.* at 32. The Clean Water Act contains Chesapeake Bay-specific provisions directing federal participation. Clean Water Act § 117, 33 U.S.C. § 1267 (2006); *see also* Adler, *supra* note 33, at 29.

207. Adler, *supra* note 33, at 33.

208. *Id.* at 34. *See generally Learn the Issues*, CHESAPEAKE BAY PROGRAM (2012), http://www.chesapeakebay.net/issues/issue/development (discussing new development and its impact on the Chesapeake Bay).

209. *See generally Development*, CHESAPEAKE BAY PROGRAM (2012), http://www.Chesapeakebay.net/issues/development#inline.

permeable roadways, shopping centers, and parking lots, and filling wetlands and streams for development.[210] Taking into account our needs and our impacts at the same time would permit more informed planning decisions. The Chesapeake Bay Program provides a model for holistic efforts to encourage sustainable development.

But the Chesapeake Bay Program contains one fatal limitation—it lacks the authority to actually implement any of its recommendations.[211] The partner states consider the program's findings and—depending on the state's political will or ability—implement recommended programs.[212] As a result, the actual efficacy of the controls varies significantly, and while the program develops comprehensive goals and objectives, the voluntary nature of implementation leaves the solution entirely in the states' hands.[213]

B. *Creating an Enforceable Watershed Approach*

In 1993, Congress solved a similar problem plaguing the Atlantic States Marine Fisheries Commission ("ASMFC"). Frustrated by inconsistent and ineffective application of fishery management plans promulgated by the ASMFC, Congress passed the Atlantic Coastal Fisheries Cooperative Management Act ("ACFCMA"), which retained the basic structure of the commission, but added some teeth.[214]

Fifteen Atlantic coast states formed the ASMFC through an interstate compact, which was recognized by Congress on May 4, 1942.[215] In its original form, and today, each ASMFC member

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210. *Id.* It is not development or growth per se that impairs our waters, but rather how we develop: today we create sprawling, low-density residential and commercial areas, using more land, destroying more forests, and increasing air and water pollution. *See id.* Sprawl and widespread development leads to greater car usage, which contributes to atmospheric deposition—another recognized contributor to nonpoint source pollution. *See id.*

211. Adler, *supra* note 33, at 33.

212. *Id.*

213. *Id.* at 33–34. Adler cites, as an example, Maryland and Virginia statutes adopted for nominally the same purpose that nonetheless "differ both in geographic reach and in the stringency of control requirements." *Id.* at 33.

214. *See* Coastal Fisheries Cooperative Management Act, 16 U.S.C. §§ 5101 to 5108 (2006); New York v. Atl. States Marine Fisheries Comm'n, 609 F.3d 524, 528–29 (2d Cir. 2010).

215. Act of May 4, 1942, Pub. L. 77-539, 56 Stat. 267, *amended by* Act of Aug. 19, 1950,

state retains authority over fisheries within its jurisdictional waters and implements the jointly approved ASMFC fishery management plans.[216] Like the Chesapeake Bay Program, the commission is not a regulatory commission; the actions it takes are not entitled to the deference accorded federal agencies.[217] But after years of states' inconsistent enforcement—which threatened Atlantic ecosystems, caused particular fish populations to plummet, and placed inconsistent burdens on state fishing industries—Congress provided for federal involvement to enforce the fishery management plans against politically unwilling states.[218]

The ACFCMA provides that the ASMFC must identify elements of fishery management plans that are "necessary for States to be in compliance with the plan."[219] If a state refuses to implement and enforce a plan, then the commission "shall" make a finding of noncompliance and "shall" notify the secretary of commerce of the noncompliance determination within ten working days.[220] The secretary of commerce is entitled to make an independent finding, but if the secretary determines that the state is out of compliance, then the secretary is required to issue a moratorium for the fishery within the noncompliant state's coastal wa-

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Pub. L. 81-721, 64 Stat. 467. Once Congress gives its consent to an interstate compact, it becomes federal law and its terms take precedence over state law—even to the extent that a compact may trump a state constitutional provision. *See* McComb v. Wambaugh, 934 F.2d 474, 479 (3d Cir. 1991); Wash. Metro. Area Trans. Auth. v. One Parcel of Land, 706 F.2d 1312, 1319 (4th Cir. 1983). Furthermore, an interstate compact is a contract, and—upon forming the compact—a state "may not enact legislation which would impose burdens upon the compact absent the concurrence of the other signatories." C.T. Hellmuth & Assocs. v. Wash. Metro. Area Trans. Auth., 414 F. Supp. 408 (D. Md. 1976) (citations omitted). Similarly, a court may not order relief inconsistent with the compact's terms. Alabama v. North Carolina, 560 U.S. ___, 130 S. Ct. 2295 (2010); Texas v. New Mexico, 462 U.S. 554, 564 (1983) (discussing the compact's transformation into federal law). Arguably, because the judiciary recognizes interstate compacts as contracts, the prohibition against unilateral action impairing or burdening the compacts stems from the United States Constitution. *See* U.S. CONST., art. I, § 10, cl. 1 ("No State shall . . . pass any Bill of Attainder, ex post facto Law, or Law impairing the Obligation of Contracts . . . .").

216. *Atl. States Marine Fisheries Comm'n*, 609 F.3d at 528.

217. *Alabama*, 560 U.S. at ___, 130 S. Ct. at 2308; *see Atl. States Marine Fisheries Comm'n*, 609 F.3d at 527.

218. *See* H.R. REP. NO. 103-202, at 6–7 (1993); *see also* Pub. L. 103-206, tit. VIII, § 802, 107 Stat. 2447 (1993). Congress noted that the bill would require changes in current fishery management necessary to improve conservation and management programs. H.R. REP. NO. 103-202, at 13 (1993).

219. 16 U.S.C. § 5104(a) (2006).

220. *Id.* § 5105(a)–(b).

ters.[221] In other words, a state may either play by the rules or go to its room without dessert.

The key is that the ACFCMA has resulted in consistent, coast-wide implementation and enforcement of fishery management plans while retaining state authority over jurisdictional fisheries.[222] Individual states still have the authority to police their waters as they see fit to achieve set targets, allowing for innovation and creativity in addressing issues unique to a state or region.[223] But ineffective enforcement has actual, immediate consequences that are politically undesirable—a moratorium means lost jobs and lost profits.[224]

While a moratorium on water consumption is impractical, imposing visible and significant monetary penalties on states or urban populations that are unwilling to implement programs or strategies recommended by a watershed agency could potentially be effective.[225] Alternatively, incentives could be provided to regions implementing creative strategies to integrate water policy.[226] It seems that the Clean Water Act anticipated the proliferation of interstate compacts and cooperative watershed programs that would eliminate "pollution" and sought to encourage uniform strategies.[227] As a result, in many ways, the skeleton for watershed agencies already exists, and the foundation for sustainable approaches is being laid in scholarly research and literature.[228]

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221. *Id.* § 5106(a)–(c).

222. *Id.* § 5101(a)–(b).

223. *See generally id.*

224. *See generally* Katring Miriam Wyman, *From Fur to Fish: Reconsidering the Evolution of Private Property*, 80 N.Y.U. L. REV. 117, 185–88 (2005).

225. *See* Novotny, *supra* note 185, at 210.

226. *See id.*

227. Clean Water Act § 103, 33 U.S.C. § 1253 (2006) ("(a) The Administrator shall encourage cooperative activities by the States for the prevention, reduction and elimination of pollution, encourage the enactment of improved, and, so far as practicable, uniform State laws relating to the prevention, reduction, and elimination of pollution; and encourage compacts between States for the prevention and control of pollution. (b) The consent of the Congress is hereby given to two or more States to negotiate and enter into agreements or compacts, not in conflict with any law or treaty of the United States, for . . . the establishment of such agencies, joint or otherwise, as they may deem desirable for making effective such agreements and compacts.").

228. *See generally* CITIES OF THE FUTURE: TOWARDS INTEGRATED SUSTAINABLE WATER AND LANDSCAPE MANAGEMENT xxii–xxiii (Vladimir Novotny & Paul R. Brown eds., 2007) (collecting papers and research from the Wingspread International Workshop); SWITCH, *supra* note 186, at 6 (collecting and analyzing research from an "action research programme" comprised of "a cross-disciplinary team of 33 partners from across the globe" at-

The major challenge for environmentalists will be to adapt the law to facilitate sustainable thinking and proactive policies, rather than retroactive Band-Aids.

CONCLUSION

This comment identified two cases implicating issues at the front end (water transfers to supply water for agricultural, industrial, and domestic consumption), and the back end (effluent discharge), of the urban water cycle. Water has multiple roles; increasingly, these roles conflict with each other and with notions of sustainability. For example, a stream with low flow due to poorly planned diversions or flood control infrastructure cannot absorb or dilute effluent discharged from storm drains or sewage systems. As a result, the cost of treatment, in dollars and energy, increases.

Watershed programs have the potential to encourage cooperation, assuage federalist concerns, and develop unique solutions to local water issues.[229] Steps taken in this direction have been encouraging, but such programs must be enforceable to be effective. We live within ecosystems and extract resources from those ecosystems; provided that we maintain some equilibrium between our consumption and ecosystem recovery, those productive ecosystems are sustainable.[230]

By most measures, the Clean Water Act has provided effective tools for controlling discharges and reducing the concentrations of pollutants in our nation's water.[231] The push to implement TMDLs and other tools for controlling pollutants from nonpoint sources promises to provide additional pollutant control.[232] However, addressing the chemical integrity of the nation's water will achieve only marginal gains in ecosystem health, which remains critically depressed. Achieving resilient socio-ecological systems will require a change in thinking—and changes in environmental

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tempting "to facilitate a paradigm shift in urban water management").

229. Adler, *supra* note 33, at 66.

230. *See* WALKER & SALT, *supra* note 27, at 30–31, 38.

231. Andreen, *supra* note 36, at 591.

232. *Id.* at 593.

laws.[233] It is not enough to address an environmental problem retroactively, nor is it enough to address an environmental issue as though it is isolated; the law must acknowledge the integrated nature of the system, while promoting adaptive ecosystem management, in order to adequately provide sustainable water management.[234]

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233. *See* WALKER & SALT, *supra* note 27, at 32–33.

234. *See id.* at 33.

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