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THE UNIVERSITY OF
ALABAMA
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**Dynamic Federalism and the Clean Water Act:
Completing the Task**

William L. Andreen

THE LAW AND POLICY OF ENVIRONMENTAL FEDERALISM:
A COMPARATIVE ANALYSIS
(Kalyani Robbins ed., Edward Elgar Publishing 2015)



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2. Dynamic federalism and the Clean Water Act: completing the task

William L. Andreen

I. INTRODUCTION

The Clean Water Act (CWA)¹ is a lengthy and complicated statute that gave rise to a vast array of implementing regulations and agency guidance.² The sheer breadth of the program reflects the complexity of its subject matter and the ambitious nature of its objective,³ namely, the restoration and maintenance of the “chemical, physical, and biological integrity of the Nation’s waters.”⁴ Amazingly, despite all of the obstacles that inevitably confront such a major reform effort, the CWA has proved remarkably successful.⁵ Both municipal and industrial point source discharges have fallen sharply, broadly enhancing water quality throughout the United States.⁶ This improvement has been so dramatic that some

¹ Act of October 18, 1972, Pub. L. No. 92-500, 86 Stat. 816 (codified as amended at 33 U.S.C. §§ 1251-1387 (2006)).

² See Adler, Robert W., “The Decline and (Possible) Renewal of Aspiration in the Clean Water Act” (2013) 88 Wash. L. Rev. 759, 760–61.

³ *Ibid.*, at 761.

⁴ Federal Water Pollution Control Act (Clean Water Act) § 101(a), 33 U.S.C. § 1251(a) (2014).

⁵ See Andreen, William L., “Water Quality Today – Has the Clean Water Act Been a Success?” (2004) 55 Ala. L. Rev. 537. According to two respected academics, the “big question” is not “why major political and policy reforms so often fail to achieve what is promised,” but “why (beyond sheer luck), given the process that seems to dominate, some major reforms succeed.” Aberbach, Joel D. and Tom Christensen (2013) “Why Reforms So Often Disappoint” 44 Am. Rev. Pub. Admin. 3, 14.

⁶ Andreen, William L., “Success and Backlash: The Remarkable (Continuing) Story of the Clean Water Act” (2013) 4 Geo. Wash. J. Energy & Envtl. L. 25, 28–30 (hereinafter Andreen, “Success and Backlash”).

have deemed it the eleventh greatest government achievement of the second half of the twentieth century.⁷

The success that the CWA has enjoyed was due in large measure to the experience and foresight of its drafters. Many of them had been intimately involved for over a decade in both the oversight of an earlier statutory program and in a series of amendments to that program.⁸ Not surprisingly, however, given the limits of individual and political capacity, the design of the CWA was not perfect. Perhaps the greatest single imperfection lies in the lack of more uniformity in the CWA's approach to federalism.

The CWA produced substantial progress in precisely the areas where Congress expanded the federal government's role in 1972. In the view of Congress, many states had failed to adopt, implement and adequately enforce acceptable standards despite years of substantial federal assistance, both financial and technical.⁹ As a result, the CWA empowered the newly created US Environmental Protection Agency (EPA) to take a more direct hand in regulating water pollution from industrial and municipal point sources such as discharge pipes and other discernible conveyances. Although the EPA became the senior partner in this new regulatory enterprise, the states retained a significant role in its implementation, subject to EPA oversight.¹⁰ It is this new, more dynamic form of federalism that has proven effective.

⁷ Light, Paul C., 'Government's Greatest Achievements of the Past Half Century' (2000) 2 *Reform Watch* 1, 4. The significance of this achievement was likely understated in Light's study since water quality improvement undoubtedly played a role in reducing disease, an achievement that placed fourth, and in ensuring safe food and water, which placed sixth. See *ibid.*, Hoornbeek, John A., "Water Pollution Policies and the American States: Runaway Bureaucracies or Congressional Control?" (2011) at 229.

⁸ See Andreen "The Evolution of Water Pollution Control in the United States – State, Local, and Federal Efforts, 1789–1972: Part II" (2003) 22 *Stan. Envtl. L.J.* 215, 242–60.

⁹ See Hoornbeek, *supra*, n. 7, at 57; William L. Andreen, "Delegated Federalism Versus Devolution: Some Insights from the History of Water Pollution Control" in Buzbee, William W. (ed.) *Preemption Choice: The Theory, Law, and Reality of Federalism's Core Question* (Cambridge University Press, New York, 2009) 257, 258 (hereinafter Andreen, "Delegated Federalism"). As Oliver Houck succinctly put it: "We have a federal CWA for one reason: programs run by the states with federal assistance had failed utterly for 25 years." Houck, Oliver A., "Cooperative Federalism, Nutrients, and the Clean Water Act: Three Cases Revisited" (2014) 44 *Envtl. L. Rep.* 10426, 10426.

¹⁰ See *infra*, nn 31–32, 37–45 and accompanying text.

Congress unfortunately failed to apply the new model to two significant sources of water pollution: non-point source pollution – diffuse runoff from, for example, fields and logging operations – and hydrologic modifications, such as water withdrawals, impoundments and diversions for offstream uses.¹¹ In both cases Congress bowed to the old concept of dual federalism, the notion that the states and the federal government operate in separate and independent spheres.¹² But the separation was not complete. A planning scheme and eventually financial support were provided to states to assist them in dealing with non-point source pollution,¹³ and the CWA does recognize a federal role with regard to hydrologic modifications.¹⁴ Nevertheless, both areas lie primarily within state prerogative, and most states have failed to regulate non-point source pollution¹⁵ and have avoided restricting water use to protect water quality.¹⁶

In contrast to the progress that has been achieved under the point source program, the less directive approach towards non-point sources has proved ineffective.¹⁷ Non-point source pollution is now considered to

¹¹ I refer to water quality problems produced by hydrologic modifications as pollution because the Act defines “pollution” broadly as “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water.” Federal Water Pollution Control Act (Clean Water Act) § 502(19), 33 U.S.C. § 1362(19) (2014).

¹² See Lieber, Harvey, “Federalism and Clean Waters: The 1972 Water Pollution Control Act 1” (Lexington Books, Lexington, Mass. 1975).

¹³ See *infra*, nn 50–58 and accompanying text.

¹⁴ See *infra*, nn 75–82 and accompanying text.

¹⁵ See *infra*, nn 91–92 and accompanying text.

¹⁶ See Benson, Reed D., “Pollution Without Solution: Flow Impairment Problems Under Clean Water Act Section 303” (2005) 24 *Stan. Envtl L.J.* **199**, 204–05.

¹⁷ Two other CWA programs are primarily federal in orientation. First, the Act prohibits unpermitted discharges of dredged or fill material into waters of the United States. Federal Water Pollution Control Act (Clean Water Act) §§ 301(a), 404, 33 U.S.C. §§ 1311(a), 1344 (2014). This program is administered by the US Army Corps of Engineers although its permits are crafted pursuant to EPA guidance and are subject to EPA review and veto. *Ibid.* § 404(b), (c), 33 U.S.C. § 1311(b), (c). Only two states have obtained authority to issue these permits for their non-navigable waters and adjacent wetlands. See “State Delegations – Clean Water Act, Envtl. Council of the States,” accessed 14 July 2015 at www.ecos.org/section/states/enviro_actlist/states_enviro_actlist_cwa. Despite a number of programmatic and jurisdictional problems, this program, together with conservation provisions found in a number of farm bills, has reduced annual wetlands losses by over 90 percent. See Andreen, “Success and Backlash,” *supra*,

be responsible for over 75 percent of the rivers and lakes that fail to meet water quality standards.¹⁸ One particular kind of non-point source, runoff from agriculture, tops the charts as the principle source of impairment in US waters,¹⁹ while hydromodifications constitute the second-leading cause of impairment on our flowing waters.²⁰ Natural stream flow regimes, moreover, have been altered on 86 percent of the rivers and streams in the contiguous United States, and such anthropogenic changes have wreaked extensive ecological damage.²¹ Our current approach to these polluting activities is simply not working.

The rigid approach of dual federalism has failed in both instances. While some states have taken strong action to combat non-point source pollution, most have not, federal support notwithstanding.²² The same is true of efforts to ensure stream flows that reasonably reflect the natural hydrograph in terms of flow, timing, duration, and rate of change.²³ A more dynamic approach is necessary, one that utilizes the strengths and policy advantages that exist at both levels of government and recognizes

n. 6, at 30. The second program deals with oil spills. Both section 311 and the Oil Pollution Act of 1990 are federally administered. Since section 311 was enacted in late 1972, both the number of spills and the amount of oil that is released annually into US waters have been on a downward trend with the exception of several notable events like the Deepwater Horizon spill. Office of Investigations & Compliance Analysis, U.S. Coast Guard (2012) "Polluting Incidents in and Around U.S. Waters: A Spill/Release Compendium: 1969–2011" at 3.

¹⁸ See Glicksman, Robert L. and Matthew R. Bezel, "Science, Politics, Law, and the Arc of the Clean Water Act: The Role of Assumptions in the Adoption of a Pollution Control Landmark" (2010) 32 Wash. U. J.L. & Pol'y 99, 132.

¹⁹ See Adler, Robert W., "Agriculture and Water Quality: A Climate-Integrated Perspective" (2013) 37 Vt L. Rev. 847, 854 (hereinafter Adler, "Agriculture and Water Quality").

²⁰ Office of Water, U.S. Env'tl Prot. Agency (2009) National Water Quality Inventory: Report to Congress 16, fig. 3.

²¹ Carlisle, Daren M. et al., "Alteration of Streamflow Magnitudes and Potential Ecological Consequences: A Multiregional Assessment" (2011) 9 Frontiers in Ecology & the Env't 264, 264 (assessing streamflow alteration at 2,888 monitoring stations).

²² Only seven states regulate non-point source pollution to some extent. U.S. Gen. Accountability Office (2013), Clean Water Act: Changes Needed if Key EPA Program Is to Help Fulfill the Nation's Water Quality Goals 26 (listing California, Florida, Hawaii, Oregon, Pennsylvania, Washington, and Wisconsin) (hereinafter GAO, Clean Water Act).

²³ See Benson, *supra*, n. 16, at 214 (stating that it is "extremely uncommon" among the states to regulate water quantity in pursuit of water quality).

the limitations, legal and otherwise, that constrict the ability of either level of government, acting alone, to complete the task of restoring the integrity of the nation's waters.

After setting forth the CWA's current bifurcated approach to cooperative federalism, containing both dynamic as well as more dual approaches, the chapter examines at greater length the question whether the states have been creative and capable leaders within the realms left to their authority or whether they have demonstrated the lack of capacity or willingness to meet the challenge. That story demonstrates the limits of relying primarily upon state action and underscores a principal reason why we have not more successfully tackled the problems of non-point source pollution and flow impairment. The chapter concludes by discussing a number of ways in which a more dynamic form of federalism could help to fill the voids that lie at the heart of the CWA.

II. THE CLEAN WATER ACT'S BIFURCATED APPROACH TO FEDERALISM

Early in the decade of the 1970s, Congress grew impatient with rivers that resembled "sewers" flowing to the sea.²⁴ Convinced that water pollution was a national problem meriting a national response and armed with the experience of over a decade of legislating in the area, Congress set forth in bold fashion. It cast aside an earlier program that had called upon states to adopt and implement water quality standards since many states had failed to adopt acceptable standards or implementation plans.²⁵ In its stead, Congress adopted a wholly new approach for dealing with the most obvious and, at that time, the largest sources of water pollution – industrial and municipal point sources.²⁶

²⁴ The primary author of the Act, Senator Edmund Muskie, alluded to "sewers" when describing the appalling condition of many of the nation's rivers and streams on the floor of the Senate. 2 (1973) "A Legislative History of the Water Pollution Control Act Amendments of 1972," 1253 (hereinafter "Leg. Hist. 1972").

²⁵ Just over half of the states had fully approved water quality standards by the end of 1970. Hort Holmes, Beatrice, *History of Federal Water Resources Programs and Policies 1961-70* (Dept of Agriculture, Economics, Statistics, and Cooperatives Service, Washington, 1979), p. 190.

²⁶ Congress also understood, however, that non-point source pollution was a "major source of pollution." S. Rep. No. 92-414, at 39, reprinted in 2 Leg. Hist. 1972, *supra*, n. 24 at 1457.

A. The Point Source Program

The new point source program vastly increased the federal role in fighting water pollution. EPA was directed to promulgate uniform, technology-based effluent limitations²⁷ that would be implemented through a new permit program,²⁸ which would apply to all point source discharges.²⁹ Rather than wholly discarding state water quality standards, Congress kept the program, incorporating it into the permit system in order to supplement technology-based limits in cases where a uniform approach would fail to ensure compliance with water quality objectives.³⁰ The states, however, retained important roles. They could, for example, obtain authority to administer the permit system, and the vast majority of states have done so.³¹ In addition, they can establish regulatory standards and limits that are more stringent than those required by federal law.³² So while Congress nationalized the business of water pollution control to a significant degree, the CWA created a complex set of overlapping and shared functions.

EPA, nevertheless, is the senior partner in this system. EPA has the sole authority to set uniform effluent limitations, unless of course a state has the capacity and desire to establish more protective limits. Furthermore, EPA has oversight authority over many aspects of the program.

²⁷ Federal Water Pollution Control Act (Clean Water Act) §§ 301(b)(1)(A), (b)(1)(B), (b)(2), 306(b)(1)(B), 33 U.S.C. §§ 1311(b)(1)(A), (b)(1)(B), (b)(2), 1316(b)(1)(B) (2014).

²⁸ *Ibid.* § 402, 33 U.S.C. § 1342.

²⁹ See *ibid.* § 301(a), 33 U.S.C. § 1311(a).

³⁰ *Ibid.* § 303, 33 U.S.C. § 1313.

³¹ *Ibid.* § 402(b), 33 U.S.C. § 1342(b). Forty-six states and the Virgin Islands currently possess authority to issue CWA permits. U.S. Env'tl. Prot. Agency, Nat'l Pollutant Discharge Elimination System (NPDES), Specific State Program Status, accessed 14 July 2015 at cfpub.epa.gov/npdes/statestats.cfm?program_id=45&view=specific. In some of these states, however, the authority does not extend to every kind of discharge. See *ibid.* In those instances, EPA remains the permitting authority.

³² Federal Water Pollution Control Act (Clean Water Act) § 510, 33 U.S.C. § 1370 (2014). EPA estimated in 1986 that 40 percent of major municipal permits and perhaps an equal fraction of major industrial permits were based in some manner upon water quality standards. Office of Tech. Assessment, U.S. Cong., *Wastes in Marine Environments* 205 (1987). The fraction of minor sources, both municipal and otherwise, with water quality related permit parameters is likely much lower.

EPA may veto state-issued permits;³³ in extreme cases, EPA may withdraw state permitting authority;³⁴ EPA is directed to review state water quality standards and has the authority to disapprove a standard if it is not consistent with the requirements of the CWA;³⁵ and EPA has the power to help shape state programs through the provision of federal financial assistance and the promulgation of program regulations.³⁶ Despite EPA's expansive role, the states remain significant actors in the point source program.

In addition to permitting activities, the states set their own water quality standards – consisting of designated uses and the criteria designed to meet those uses³⁷ – and are responsible for implementing those standards directly through their permits³⁸ or more indirectly through the establishment of waste load allocations and the application of those allocations to permits.³⁹ They are also responsible, in significant measure, for enforcing the permit program,⁴⁰ although this authority is shared with both EPA and private citizens in a thoroughly redundant enforcement scheme.⁴¹ Furthermore, states and local governments play a vital role in the implementation and enforcement of the pretreatment program, which regulates toxic industrial discharges to municipally owned wastewater treatment plants.⁴²

States also have the freedom to take steps that directly or through incentives provide additional protection to their waters since the CWA utilizes floor preemption rather than ceiling preemption.⁴³ This approach is given added force through a certification provision that effectively endows states with authority to veto or impose conditions upon federal licensing or permitting activities that may adversely affect the quality of

³³ Federal Water Pollution Control Act (Clean Water Act) § 402(d), 33 U.S.C. § 1342(d) (2014).

³⁴ *Ibid.* § 402(c), 33 U.S.C. § 1342(c).

³⁵ *Ibid.* § 303(c), 33 U.S.C. § 1313(c).

³⁶ *Ibid.* § 106, 33 U.S.C. § 1256; 40 C.F.R. Pts. 123–24, 130, 131 (2013).

³⁷ *Ibid.* § 303(c), 33 U.S.C. § 1313(c).

³⁸ *Ibid.* §§ 402(a), 301(b)(1)(C), 33 U.S.C. §§ 1342(a), 1311(b)(1)(C).

³⁹ See *ibid.* § 303(d), 33 U.S.C. § 1313(d).

⁴⁰ See Andreen, William L., “Motivating Enforcement: Institutional Culture and the Clean Water Act” (2007) 24 *Pace Envtl L. Rev.* 67, 74–75 (hereinafter Andreen, ‘Motivating Enforcement’).

⁴¹ Federal Water Pollution Control Act (Clean Water Act) §§ 309, 505, 33 U.S.C. §§ 1319, 1365 (2014).

⁴² *Ibid.* § 307(b), (c), 33 U.S.C. § 1317(b), (c).

⁴³ *Ibid.* § 510, 33 U.S.C. § 1370.

state waters.⁴⁴ Another considerable font of state power is found in the savings clause contained in the Act's citizen suit provision. Despite the creation of a federal statutory right to sue polluters who violate the Act, this provision expressly preserves the right of persons to utilize state tort law to sue dischargers for the injuries they cause.⁴⁵

While many problems and challenges remain,⁴⁶ the point source program has produced a tremendous amount of progress. In 1977, 91 percent of the United States' water basins were experiencing water quality problems resulting from point source discharges, while 87 percent were suffering from non-point source problems.⁴⁷ Today, on the other hand, non-point source pollution, rather than point source pollution, is the primary culprit.⁴⁸

B. The Non-point Source Program

Rather than directly regulate non-point pollution, Congress chose to leave the problem – as politically and administratively difficult it is to address⁴⁹ – to the states. Thus, the CWA in 1972 relied upon a state planning process that was supposed to produce management plans to address non-point source impaired waters.⁵⁰ This program proved ineffective, so

⁴⁴ Ibid. § 401, 33 U.S.C. § 1341.

⁴⁵ See *ibid.* § 505(e), 33 U.S.C. § 1365(e).

⁴⁶ See e.g. Andreen, William L. and Shana Jones, "The Clean Water Act: A Blueprint for Reform" (2008), accessed 14 July 2015 at www.progressive-reform.org/articles/CW_Blueprint_802.pdf.

⁴⁷ Office of Water Planning & Standards, U.S. Evtl Prot. Agency, Nat'l Water Quality Inventory: 1977 Report to Congress 9 (1978).

⁴⁸ See Nat'l Summary of State Information, U.S. Evtl Prot. Agency, accessed 14 July 2015 at iaspub.epa.gov/waters10/attains_nation_cy.control. As the Congressional Research Office has noted, "Over time, as [point source discharges] have abated pollution, uncontrolled non-point sources have become a larger relative portion of remaining water quality problems." Copeland, Claudia, Cong. Research Serv., R42752, Clean Water Act and Pollutant Total Maximum Daily Loads 5 (2012).

⁴⁹ Garovoy, Jocelyn B., "A Breathtaking Assertion of Power? Not Quite" (2003) 30 *Ecology L.Q.* 543 (noting the difficulties presented by the diffuse and varied nature of non-point source pollution and the political opposition to controls posed by agricultural, timber, and development interests).

⁵⁰ Federal Water Pollution Control Act (Clean Water Act) § 208, 33 U.S.C. § 1288 (2014). The only action EPA could take if a state program was deemed inadequate was to withdraw state approval and grant funds. *Ibid.* § 208(b)(4)(D), (f)(3), 33 U.S.C. § 1288(b)(4)(D), (f)(3).

Congress added a new provision in 1987.⁵¹ Unfortunately it was “not significantly different in its overall approach.”⁵² The new section 319 called upon the states to identify those waters impaired by non-point source pollution and to then develop “best management practices” (BMPs) to remedy the problem “to the maximum extent possible.”⁵³ Although these plans are subject to EPA review, Congress permitted states to use non-regulatory approaches such as technical assistance, education, training, and demonstration projects as alternatives to regulation.⁵⁴ The only sanction EPA has at its disposal, in the event that a state program is found wanting, is to withhold funding for the state non-point source program – rather than establish an adequate program in its stead.⁵⁵ Since withholding funds would deprive a state of much of its ability to make at least some progress in controlling non-point source pollution, EPA has been unwilling to take that step.⁵⁶ As a result of the reluctance of most states to establish regulatory programs,⁵⁷ limited federal leverage over state programs and inadequate funding, the section 319 program has failed to make great progress in combating non-point source pollution.⁵⁸

Another tool exists under the CWA to deal with non-point source discharges. Under section 303(d), states are directed to identify those waters that are not meeting water quality standards.⁵⁹ The states are then required to establish a pollution budget, known as a “total maximum daily load” (TMDL) for those pollutants responsible for the water’s impaired condition. The TMDL is essentially a numeric target that is required to restore the water to compliance with water quality standards with a margin of safety while also taking into account seasonal variations

⁵¹ Percival, Robert V. et al., *Environmental Regulation: Law, Science, and Policy*, 7th edn, (Wolters Kluwer, Austin, Boston, Chicago, New York, the Netherlands 2013), p. 794.

⁵² Adler, ‘Agriculture and Water Quality’, *supra*, n. 19, at 861.

⁵³ Federal Water Pollution Control Act (Clean Water Act) § 319(a), (b), 33 U.S.C. § 1229(a), (b) (2014).

⁵⁴ *Ibid.* § 319(b), 33 U.S.C. § 1229(b).

⁵⁵ *Ibid.* § 319(d)(2), (h)(8), 33 U.S.C. § 1229(d)(2), (h)(8).

⁵⁶ Dubrowski, Fran, “Crossing the Finish Line” (July–Aug. 1997) *Envtl F.* **28**, 32–33.

⁵⁷ See *supra*, n. 22. Most states use an incentive-based or voluntary program instead of regulations to address non-point source pollution. Copeland, *supra*, n. 48, at 17.

⁵⁸ Percival, *supra*, n. 51, at 795.

⁵⁹ Federal Water Pollution Control Act (Clean Water Act) § 303(d)(1)(A), 33 U.S.C. § 1313(d)(1)(A) (2014).

in flow.⁶⁰ This budget or loading capacity must in turn be allocated, as appropriate, to point sources (wasteload allocation) and non-point sources (load allocation).⁶¹

TMDLs are subject to EPA review. In the event that a state TMDL is found inadequate, EPA is not only empowered but ordered to adopt one.⁶² EPA, however, has no particular authority to implement TMDLs. That presents no particular problem for point source discharges since wasteload allocations are defined as a form of water quality-based effluent limitation.⁶³ Thus, they should be included in point source permits as long as a state is properly implementing the program or where EPA is the permitting agency. On the other hand, there is no statutory or regulatory provision requiring the implementation of load allocations for non-point sources. That task is left entirely to state initiative or the lack thereof.⁶⁴

States took little action to set TMDLs until a host of citizen suits established the proposition that EPA had a duty to establish TMDLs for states that had failed to do so.⁶⁵ Since the early 1990s, nearly 50,000 TMDLs have been developed, many of which were the result of consent decrees in mandatory duty cases filed against EPA.⁶⁶ State TMDL coordinators report that 83 percent of wasteload allocations for point sources have been met in long-established TMDLs. In contrast to that relatively high level of compliance, only 20 percent of load allocations for non-point sources have been met.⁶⁷ The difference may well be ascribed to the fact that non-regulatory mechanisms are overwhelmingly relied upon to implement TMDLs for the non-point source community and that inadequate funding has been available for encouraging compliance with the BMPs that TMDLs either call for or implicate.⁶⁸

⁶⁰ Ibid. § 303(d)(1)(C), 33 U.S.C. § 1313(d)(1)(C).

⁶¹ 40 C.F.R. §§ 130.2(g), (h); 130.7.

⁶² Federal Water Pollution Control Act (Clean Water Act) § 303(d)(2), 33 U.S.C. § 1313(d)(2) (2014).

⁶³ 40 C.F.R. § 130.2(h).

⁶⁴ Adler, "Agriculture and Water Quality," *supra*, n. 19, at 868. The states, however, are directed to incorporate TMDLs (including load allocations) into their continuing planning processes. Federal Water Pollution Control Act (Clean Water Act) § 303(d)(2), 33 U.S.C. § 1313(d)(2) (2014).

⁶⁵ See Percival, *supra*, n. 51, at 768.

⁶⁶ GAO, Clean Water Act, *supra*, n. 22, at 3.

⁶⁷ Ibid. at 35.

⁶⁸ See *ibid.* at 62 (reporting that, according to state TMDL coordinators, 86 percent of long-standing TMDLs have not had adequate funding for implementation of non-point source controls).

C. Flow Impairment

Water quality is intimately related to water quantity. Healthy aquatic systems simply cannot exist on rivers and streams with little or no flow.⁶⁹ All too often, however, water has been treated as a commodity for exclusive human use and consumption. In the West, water withdrawals, impoundments and diversions “routinely dry up rivers – including some of the major ones in the region – or reduce them to a relative trickle.”⁷⁰ In the East, water diversions have spawned regional conflict,⁷¹ while the operation schedule of hydroelectric dams produce excessively high and low flows in rapid succession producing wide-ranging adverse effects upon the aquatic environment.⁷² Anthropogenic flow alterations can also increase water quality problems by increasing the concentration of pollutants in a stream.⁷³ Simply providing a minimum flow in order to maintain certain species is not an adequate response. In order to sustain aquatic diversity and protect the ecological services provided by flowing

⁶⁹ PUD No. 1 of *Jefferson Cnty. v Wash. Dep’t of Ecology* (1994) 511 U.S. 700, 719 (declaring that “a sufficient lowering of the water quantity in a body of water could destroy all of its designated uses, be it for drinking water, recreation, navigation or ... as a fishery”).

⁷⁰ Benson, *supra*, n. 16, at 202. Hydraulic fracturing will produce even greater stress in our more arid areas since the production of shale gas using this process typically requires the use of 2–4 million gallons of water per well. Office of Res. & Dev., U.S. Env’tl. Prot. Agency, Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water 19 (2011) (hereinafter EPA, Potential Impacts of Hydraulic Fracturing).

⁷¹ See Andreen, William L., “Alabama,” in Kelley, Amy K. (ed.) *Waters and Water Rights*, 3rd edn (LexisNexis (Michie), 2015), pp AL-1, AL-16 to AL-27 (discussing the dispute between Georgia, Florida, and Alabama over the Apalachicola–Chattahoochee–Flint River system and the dispute between Alabama and Georgia over the Alabama–Coosa–Tallapoosa system).

⁷² Arthington, Angela H., *Environmental Flows: Saving Rivers in the Third Millennium* (University of California Press, California 2012), pp. 116–17 (2012) (stating that “hydroelectric dams cause extreme daily variations in water level that have no natural analogue in freshwater systems and represent an extremely harsh environment of frequent, unpredictable flow disturbance”). Even in the East, the use of hydraulic fracturing to produce shale gas may impact flows in the headwaters of many watersheds. See EPA, Potential Impacts of Hydraulic Fracturing, *supra*, n. 70, at 21.

⁷³ See Benson, *supra*, n. 16, at 203. Rapidly fluctuating water levels can also produce increased sedimentation and siltation due to erosion.

waters one must seek to establish and maintain “natural flow variability, or some semblance of it.”⁷⁴

The CWA recognizes that the alteration of stream flows can constitute water pollution. “Pollution,” in the Act, is broadly defined as “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water,”⁷⁵ and the biological integrity of streams is certainly impacted by low flows and other flow impairments.⁷⁶ Moreover, the Act explicitly states that “pollution” can result from “changes in the movement, flow, or circulation” of our rivers and streams.⁷⁷ Despite this recognition, Congress also provided in the Act’s preemption provision that nothing in the CWA may “be construed as impairing or in any manner affecting any right or jurisdiction of the States with respect to the waters ... of such State.”⁷⁸ During the 1977 amendments to the Act, Congress added more precise language pertaining to water quantity issues to the provision dealing with the goals and policy of the Act. This amendment declares that “[i]t 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.”⁷⁹

According to the Supreme Court, these latter two provisions do not exclude the regulation of water quantity from the purview of the Act. Rather, they preserve traditional state authority “to allocate water quantity as between users; they do not limit the scope of water pollution controls that may be imposed on users who have obtained, pursuant to state law, a water allocation.”⁸⁰ Recognizing the intertwined interests of both federal and state governments in water quality and water quantity issues,⁸¹ the CWA also directs federal agencies to “co-operate with State

⁷⁴ Arthington, *supra*, n. 72, at 10.

⁷⁵ Federal Water Pollution Control Act (Clean Water Act) § 502(19), 33 U.S.C. §1362(19) (2014).

⁷⁶ See *PUD No. 1 of Jefferson Cnty. v Wash. Dep’t of Ecology*, 511 U.S. 700, 719 (1994).

⁷⁷ Federal Water Pollution Control Act (Clean Water Act) § 304(f), 33 U.S.C. § 1314(f) (2014).

⁷⁸ *Ibid.* § 510, 33 U.S.C. § 1370.

⁷⁹ *Ibid.* § 101(g), 33 U.S.C. § 1251(g).

⁸⁰ *PUD No. 1 of Jefferson Cnty.*, 511 U.S. at 720. In *California v FERC*, 495 U.S. 490, 498 (1990), the Court interpreted somewhat similar language in the Federal Power Act and said that “minimum stream flow requirements neither reflect nor establish ‘proprietary rights’” to water.

⁸¹ While state law has traditionally governed water rights, the federal government has played a pivotal role in the management of the nation’s water

and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources.”⁸²

Despite the call for a more integrated approach to water management, the regulation of water quantity and water quality have remained highly compartmentalized. It is an approach that defies logic, science and the apparent will of Congress. Most states have been reluctant to regulate water quantity in order to protect water quality.⁸³ EPA, however, has recently encouraged states to consider the explicit expression of flow as part of their water quality standards either through a numeric standard (for example, no more than a specific percentage change from the natural flow regime) or through a narrative standard (for instance, flow adequate to support the aquatic criteria).⁸⁴ Unfortunately, these efforts have prompted some states to object to “the ever increasing encroachment of federal entities” into issues of “water quantity [that] have been [traditionally] managed by the State.”⁸⁵

III. THE STATES: LABORATORIES OF DEMOCRACY OR LAGGARDS?

Most states have not been zealous guardians of their water resources. Although the CWA gives states the authority to set more stringent water pollution standards, they seldom do so.⁸⁶ In fact, 28 states have enacted statutes or rules that either forbid or restrict the authority of state

resources. This role runs the gamut from huge water and irrigation projects to hundreds of flood control dams; from water subsidies to navigational improvements and the licensing of water power projects; and from the protection of endangered species and wetlands to a proprietary interest in water flowing through federal land. See e.g. Water Res. Council, *Water Resource Policy Study*, 42 Fed. Reg. 36788 (1977).

⁸² Federal Water Pollution Control Act (Clean Water Act) § 101(g), 33 U.S.C. § 1251(g) (2014).

⁸³ Benson, *supra*, n. 16, at 214.

⁸⁴ See e.g. Letter from Joanne Benante, Chief, Water Quality Planning Branch, U.S. Env'tl. Prot. Agency, Region 4, to James McIndoe, Chief, Water Div., Ala. Dep't of Env'tl. Mgmt. (20 August 2010).

⁸⁵ See e.g. Letter from Jess Nix, Deputy Attorney Gen., State of Ala., to J. Brian Atkins, Div. Dir., Ala. Office of Water Res. (1 November 2012).

⁸⁶ Selmi, Daniel P. and Kenneth A. Manaster, *State Environmental Law* (looseleaf) (ThomsonReuter 2013) §§ 11:3, 11:10.

agencies to exceed federal water pollution standards.⁸⁷ Even after the duty to prepare TMDLs became clear in the early 1990s, many states dragged their feet in preparing TMDLs, citing numerous difficulties with the process, despite the fact that they have historically expressed a preference for using water quality standards rather than uniform effluent limitations to control water pollution.⁸⁸ Even when TMDLs have been set, most states lack any effective way in which to compel non-point sources to comply with identified BMPs.⁸⁹ As a result, “few TMDLs have been implemented for non-point source pollution” and, even when they have been implemented, “progress has generally been incremental.”⁹⁰

Only a handful of state agencies possess the authority to regulate non-point source pollution.⁹¹ And even that authority may be limited in scope; in some cases, moreover, it may not even be used. Pennsylvania, for example, requires farms to have a plan to control sediment runoff over a certain threshold amount. Nonetheless, state officials report that this provision has never been enforced despite the fact that it has been in effect for over 40 years.⁹²

This lack of zealotness extends to many other areas as well. Not only have most states been reluctant to regulate water quantity to protect water quality, but a few have actually forbidden restrictions on water use based on water quality considerations.⁹³ Furthermore, state water pollution enforcement has been on a downward trajectory since the mid-1990s,⁹⁴ and many state enforcement programs continue to underperform.⁹⁵ In addition, instances where states have vetoed or conditioned federal permits on the basis of water quality concerns have been relatively rare.⁹⁶

⁸⁷ Env'tl Law Inst., *State Constraints: State-Imposed Limitations on the Authority of Agencies to Regulate Waters Beyond the Scope of the Federal Clean Water Act 1* (2013).

⁸⁸ Houck, Oliver A., *The Clean Water Act TMDL Program: Law, Policy, and Implementation*, 2nd edn (Environmental Law Institute, Washington, DC 2002), p. 63.

⁸⁹ GAO, *Clean Water Act*, *supra*, n. 22, at 61.

⁹⁰ *Ibid.* at 62.

⁹¹ *Ibid.* at 26 (including California, Florida, Hawaii, Oregon, Pennsylvania, Washington and Wisconsin).

⁹² *Ibid.* at 61.

⁹³ Benson, *supra*, n. 16, at 214.

⁹⁴ Andreen, “Motivating Enforcement,” *supra*, n. 40, at 75.

⁹⁵ See Office of Inspector Gen., U.S. Env'tl Prot. Agency, *EPA Must Improve Oversight of State Enforcement* (2011).

⁹⁶ Andreen, “Delegated Federalism,” *supra*, n. 9, at 260–61.

Some states, however, have been leaders rather than laggards. This was true even before the 1970s. During the 1920s, two states created rudimentary stream classification systems that were forerunners of what became state water quality standards.⁹⁷ In the late 1940s, Pennsylvania began to utilize a simple form of effluent limitations,⁹⁸ and by the late 1960s Oregon had devised a permitting system for point source discharges requiring compliance with secondary treatment limitations or the equivalent and even more stringent limitations when necessary to meet water quality standards.⁹⁹ Many of the provisions in the CWA were based on these early state efforts. A number of states, moreover, have continued to act as laboratories of democracy.

Perhaps the most obvious instances of where some states have pushed beyond minimum federal standards are found in two water quality certification cases. In PUD No. 1 of *Jefferson County v Washington Department of Ecology*, the Supreme Court upheld the state agency's use of its section 401 authority to impose minimum flow conditions on a hydroelectric project.¹⁰⁰ The Supreme Court also upheld a Maine certification that stipulated not only a minimum stream flow but also fish passage requirements in the federal re-licensing of five hydroelectric dams.¹⁰¹ Some states, such as California, also enforce various non-point source requirements,¹⁰² while a number, such as Oregon, California and Florida, have well-articulated schemes for protecting instream flows.¹⁰³

⁹⁷ Andreen, "The Evolution of Water Pollution Control in the United States – State, Local, and Federal Efforts, 1789–1972: Part I" (2003) 22 *Stan. Env't. L.J.* 145, 182.

⁹⁸ *Ibid.* at 192–93.

⁹⁹ Or. Dep't of Env'tl. Quality, *Water Quality Control in Oregon* 2, 10 (1970). Oregon was commonly lauded as a model state program in the early 1970s. See Robbins, William G., *Landscape of Conflict: The Oregon Story, 1940-2000* (University of Washington Press, Washington, DC 2004), p. 270 (citing the EPA Regional Administrator in Seattle as saying in the fall of 1971 that he "didn't know of a water quality program in the nation that is better" than Oregon's).

¹⁰⁰ 511 U.S. 700, 709–10 (1994).

¹⁰¹ *S.D. Warren Co. v Me. Bd. of Env'tl. Prot.*, 547 U.S. 370, 375 (2006).

¹⁰² See *Pronsolino v Nastro*, 291 F.3d 1123, 1129–30 (9th Cir. 2002).

¹⁰³ See Gillilan, David M. and Thomas C. Brown, *Instream Flow Protection: Seeking a Balance in Western Water Use* (Island Press, Washington, DC 1997), pp. 139–43; Adler, Robert W. et al., *Modern Water Law: Private Property, Public Rights, and Environmental Protections* (Foundation Press 2013), pp. 244–46 (2013).

For the most part, however, the states appear to have neither the capacity nor the will to go further than federal law or funding requires them or incentivizes them to go.¹⁰⁴ In fact, many may not even be willing or able to go that far if the 58 petitions that have been filed to withdraw state program authorizations shed any light on the quality of many state programs.¹⁰⁵

IV. MOVING TOWARD A MORE UNIFIED, DYNAMIC FORM OF FEDERALISM

History has demonstrated that a dynamic form of federalism, with overlapping and intertwined federal and state responsibilities, has worked well with respect to point source regulation. Where Congress relied more heavily upon a dual approach to federalism, the CWA has come up short. Technical and financial assistance, jawboning and cajoling have proven inadequate for controlling non-point source. And the near total ceding of environmental flows to state discretion has resulted in serious aquatic impairment.

When Congress enacted section 319 in 1987, members of Congress indicated that it was just “a first step in tackling the problem – a trial run, to see if allowing the States the option to develop a control program will indeed abate non-point source pollution across the Nation.”¹⁰⁶ Eventually, a decision would have to be made as to whether a voluntary program could work or whether “Congress should consider a regulatory and

¹⁰⁴ See *Res. Renewal Inst., The State of the States v* (2001) (concluding that most states lag well behind in preparing themselves for increasingly complex environmental problems); Rabe, Barry G., “Permitting, Prevention, and Integration: Lessons from the States,” in Kettle, Donald F. (ed.) *Environmental Governance: A Report on the Next Generation of Environmental Policy* (Brookings Institution Press: Harrisonburg, Va. 2002) pp. 14, 51 (stating that “many states ... appear unprepared to step up to the formidable challenges of integration and prevention”); Houck, *supra*, n. 88, at 147 (asserting that the majority of states have been reluctant to do “hard things” which would alienate “powerful constituencies” such as “the forest, farm, and construction industries”).

¹⁰⁵ See Hammond, Emily and David L. Markell, “Administrative Proxies for Judicial Review: Building Legitimacy from the Inside-Out,” (2013) 37 *Harv. Envtl L. Rev.* 313, 343. The petitions raised numerous concerns including inadequacies as to public participation, permitting, inspections, enforcement, state resources, and state authority. *Ibid.* 345.

¹⁰⁶ 132 Cong. Rec. 32,382 (1986) (statement of Sen. Robert Stafford during the Senate debate on the conference report).

enforceable approach in the next phase of the program.”¹⁰⁷ Twenty-seven years later, it is clear that the first step has not worked. The time is ripe for considering a regulatory approach to take the place of the initial voluntary scheme.

A possible starting point for such an approach may be found in the 1990 Coastal Zone Act Reauthorization Amendments (CZARA).¹⁰⁸ CZARA requires each state with an approved management plan under the Coastal Zone Management Act (CZMA)¹⁰⁹ to develop a Coastal Non-point Pollution Control Program and submit it to EPA and the National Oceanic and Atmospheric Administration (NOAA) for approval.¹¹⁰ These coastal non-point source control programs must provide for the implementation, at a minimum, of management measures that conform to guidance developed by EPA and NOAA.¹¹¹ That guidance sets forth a number of technology-based options for controlling non-point source pollution and gives state officials a good deal of flexibility in choosing among them.¹¹² If a state fails to submit an approvable program, it is subject to the loss of a portion of its CZMA grant.¹¹³

The CZMA requires that state CZARA programs contain “enforceable policies and mechanisms” to implement non-point source management measures.¹¹⁴ While “enforceable policy” is statutorily defined to mean “legally binding” laws and regulations,¹¹⁵ EPA and NOAA, as a matter of policy, will approve programs containing voluntary or incentive-based elements in order to give the states more flexibility.¹¹⁶ So far, all of the

¹⁰⁷ 130 Cong. Rec. 18,811 (1984) (statement of Rep. James Oberstar during House debate on the initial House bill).

¹⁰⁸ Pub. L. No. 101-508, 104 Stat. 1388 (codified at 16 U.S.C. § 1455b (2006)).

¹⁰⁹ Pub. L. No. 92-583, 86 Stat. 1280 (codified as amended at 16 U.S.C. §§ 1451-1466 (2006)).

¹¹⁰ 16 U.S.C. § 1455b(a)(1) (2006). The CZARA program was not intended to replace the existing state non-point source program but rather to update and expand upon it. *Ibid.* § 1455b(a)(2).

¹¹¹ *Ibid.* § 1455(b).

¹¹² See Office of Water, U.S. Env'tl Prot. Agency, *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (1993).

¹¹³ 16 U.S.C. § 1455b(c) (2006).

¹¹⁴ *Ibid.* § 1455(d)(16).

¹¹⁵ *Ibid.* § 1453(6a).

¹¹⁶ U.S. Env'tl Prot. Agency & Nat'l Oceanic & Atmospheric Admin. *Final Administrative Changes for the Coastal Nonpoint Program Guidance 4* (1998).

states participating in the CZMA program have submitted non-point source programs, and all have received either full or conditional approval.¹¹⁷ The federal agencies have had little choice. A cut in funding would hurt water quality, and, in any case, federal funding of the program has been dwindling.¹¹⁸

A better approach under a revised section 319 of the CWA would require states to establish truly enforceable best management practices – BMPs that could be drawn from a menu of technology-based options set forth by EPA to give the states some flexibility in selecting the practices that are most appropriate for their state. And instead of being all “carrot” and no “stick,” EPA should have the authority, in cases where a state submits an inadequate management plan and fails to remedy the problem, to disapprove the plan and promulgate a federal plan in its stead. Increased and stable federal funding is also necessary to provide small-scale farmers and other appropriate grant recipients with the wherewithal to comply with these new requirements. Of course, the new requirements would have to be implemented over a period of years in order to give the newly regulated entities the time and, where appropriate, access to the funding necessary to come into compliance. This new approach should be coupled with revisions to the TMDL provisions in the CWA to make it clear that load allocations developed for specific non-point sources through the TMDL process would have to be implemented and enforced. Thus, in cases where the technology-based approach found in section 319 proves inadequate to remedy water quality impairment in particular waters, the more finely crafted section 303(d) process could produce the additional steps necessary to ensure compliance with water quality objectives.

Although EPA has at times encouraged states to bridge the divide between water quality and water quantity, the agency has done little more than exhort states to act.¹¹⁹ The agency’s lack of commitment to this task may be due, at least in part, to the passage of the Wallop Amendment in 1977. The amendment added section 101(g) to the Act stating that it was congressional policy that nothing in the Act should be construed to

The agencies added, however, that voluntary or incentive-based programs must be “backed by existing state enforcement authorities” that could be used to prevent non-point source pollution, if necessary. *Ibid.*

¹¹⁷ Upton, Harold E., Cong. Research Ser., RL34339, Coastal Zone Management: Background and Reauthorization Issues 9 (2010).

¹¹⁸ *Ibid.* at 9–10.

¹¹⁹ Benson, *supra*, n. 16, at 204.

impair traditional state authority over the allocation of water.¹²⁰ Its authors, Senators Malcolm Wallop and Gary Hart, were troubled by certain options that had been floated as part of the Water Resource Policy Study¹²¹ being conducted at the request of President Carter.¹²² Senator Wallop, for instance, expressed concern that several of the options under consideration might involve using the CWA for purposes not strictly related to water quality, such as federal land use planning, in a way that could interfere with state water rights systems.¹²³ He recognized and accepted, however, that “legitimate and necessary water quality considerations” could have an impact at times upon individual water rights.¹²⁴ Thus, Justice O’Connor made it explicitly clear in the PUD No. 1 case that while the Wallop Amendment protects state authority to allocate water quantity, the provision does “not limit the scope of water pollution controls [including minimum stream flows] that may be imposed on users who have obtained” a water allocation under state law.¹²⁵

An obvious place to begin would be for EPA to require state agencies to set water quality criteria for environmental flows since appropriate flows in terms of timing and quantity are necessary to sustain the vast majority of designated uses including the protection and propagation of fish and wildlife. EPA’s regulations actually direct states to include in their water quality standards “criteria sufficient to protect the designated use.”¹²⁶ A resource-starved and politically harassed agency like EPA,¹²⁷ however, is unlikely to take such a bold step, especially since these criteria cannot be enforced under the current TMDL program, limited as it is by statutory language that restricts TMDLs to “pollutants” introduced into waters¹²⁸ rather than the broader term “pollution” that would include flow conditions.¹²⁹

¹²⁰ Federal Water Pollution Control Act (Clean Water Act) § 101(g), 33 U.S.C. § 1251(g) (2014).

¹²¹ Water Res. Council, Water Resource Policy Study: Issue and Option Papers, 42 Fed. Reg. 36,789 (1977).

¹²² 123 Cong. Rec. 39,211 (1977) (Senate debate on the conference report).

¹²³ *Ibid.* at 39,211–12.

¹²⁴ *Ibid.* at 39,212.

¹²⁵ *PUD No. 1 of Jefferson Cnty. v Wash. Dep’t of Ecology* (1994) 511 U.S. 700, 720.

¹²⁶ 40 C.F.R. § 131.6 (2013).

¹²⁷ See Andreen, “Success and Backlash,” *supra*, n. 6, at 31–34.

¹²⁸ Federal Water Pollution Control Act (Clean Water Act) § 303(d)(1)(C), 33 U.S.C. § 1313(d)(1)(C) (2014).

¹²⁹ See *supra*, nn 75–77 and accompanying text.

While EPA could take a number of steps to begin to address the problem,¹³⁰ Congress will ultimately have to act, just as it will have to act in order to invigorate the non-point source program – assuming, of course, that the nation will one day emerge from the dysfunctional gridlock that has gripped Congress for much of the past quarter-century. Congress could explicitly find that environmental flows are a necessary ingredient of water quality criteria; require states to place flow-impaired waters on their TMDL lists – at least to shine a spotlight on these problem waters; extend TMDLs to include “pollution” rather than just “pollutants” or at least encourage states to consider flow restoration in developing TMDLs for their pollutant-impaired streams; make flow impairment a priority under the non-point source program; and appropriate adequate funds to both EPA and the states to enable them to undertake the research that will be necessary to set instream flows reflecting the natural variations in stream levels and the subsequent monitoring that will be necessary to help fine-tune the flows in an adaptive manner. Congress could also require all federally owned or operated hydromodifications, including dams and water diversions as well as federally permitted dams, to comply with state instream flow criteria. The states, however, must cooperate in this effort.

As the Wallop Amendment recognized, the allocation of water in this country is, for the most part, a matter of state law.¹³¹ Nevertheless, a long-neglected provision contained in the Wallop Amendment should be dusted off and put into action. That provision directed federal agencies “to co-operate with State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources.”¹³² The states and EPA, in short, must work together to address the problem of adequate stream flow, and Congress should reemphasize this obligation and provide some incentives for state participation. Congress could, for example, provide funding to western states to enable them to purchase water rights for flow restoration and a similar form of funding could be provided to the eastern states that utilize a form of regulated riparianism.¹³³ In addition, grants could be made available, where necessary, to assist agriculture, which is

¹³⁰ See Benson, *supra*, n. 16, at 257–62.

¹³¹ See Tarlock, A. Dan, et al., *Water Resource Management*, 7th edn (Foundation Press, St. Paul, Minn. 2014), p. 527.

¹³² Federal Water Pollution Control Act (Clean Water Act) § 101(g), 33 U.S.C. § 1251(g) (2014).

¹³³ Over half of the eastern states have adopted permitting programs that are commonly referred to as regulated riparianism. Adler, *supra*, n. 103, at 232.

responsible for approximately 80 percent of the nation's consumptive water use,¹³⁴ to utilize more efficient forms of irrigation¹³⁵ or switch to less water-intensive crops. The list of policy options could go on and on. The most important thing, however, is that the nation must move toward the integration of water quality and water quantity law and policy.

V. CONCLUSION

Progress towards achieving the CWA's goals of restoring and maintaining "the chemical, physical, and biological integrity of the nation's waters" has stalled largely because we have failed to control non-point source pollution and because we have failed to ensure that our waters receive the environmental flows that are necessary to sustain their aquatic ecosystems. Much of the blame for these failures can be attributed to an outmoded approach to the allocation of governmental authority. While a number of states have demonstrated the capacity and the will to meet the challenge of dealing with one or both of these problems, the majority have not, and that leaves a gaping hole in our ability to complete the task that was begun in 1972. If the point source program is a reliable guide, its success should point to the use of a more dynamic form of federalism to help fill those gaps and thereby fulfill the promise of clean waters that was heralded by Congress in 1972.

¹³⁴ Econ. Res. Serv., Irrigation & Water Use, U.S. Dep't of Agric., accessed 14 July 2015 at www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use.aspx.

¹³⁵ Although the number of irrigated acres using sprinkler and micro-irrigation systems has grown, 44 percent of irrigated acreage still rely upon surface (flood) systems. See Kenny, Joan F. et al., U.S. Dep't of Interior & U.S. Geological Survey, *Estimated Use of Water in the United States in 2005* (2009), 1.